2013 Illinois Natural Hazard Mitigation Plan

Pat Quinn
GOVERNOR

10/2013

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GOVERNOR

October 1st, 2013

The Illinois Natural Hazard Mitigation Plan (INHMP) establishes a process for identifying and mitigating the effects of natural hazards in the State of Illinois as required under the Disaster Mitigation Act of 2000. The development and maintenance of the INHMP is a cooperative effort of state agencies, coordinated by the Illinois Emergency Management Agency (IEMA). All grant funding which is provided as a result of this plan will be administered in accordance 44 CFR §13.11(c).

Hazard mitigation is an important component of emergency management which reduces or eliminates losses to human life and property. The INHMP addresses the history, relative risk and actions which can be taken to mitigate the seven types of natural hazards that can affect Illinois: severe storms, tornadoes, floods, severe winter storms, drought, extreme heat and earthquakes.

It is essential that the State of Illinois continue to mitigate losses of human life and property. The INHMP will be continually reviewed, maintained and updated to reflect the changes in Federal and State statutes and mitigation opportunities within the State of Illinois. IEMA, pursuant to the Illinois Emergency Management Agency Act (20 ILCS 3305/), will coordinate the periodic update and revision of the INHMP.

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FORWARD

The Illinois Natural Hazard Mitigation Plan (INHMP) was developed as a cooperative effort of state agencies under the coordination of the Illinois Emergency Management Agency (IEMA). It discusses the process used to identify, profile and assess natural hazards in Illinois and the actions which should be taken to mitigate those hazards.

The INHMP facilitates the delivery of mitigation grant funding to organizations through the Flood Mitigation Assistance (FMA) Program, Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM) Program. The INHMP addresses mitigation planning requirements for these programs.

The INHMP will continue to be reviewed and enhanced as new mitigation opportunities become available. Comments and suggestions are welcome and should be forwarded to my attention at the address below.

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Springfield, Illinois 62703

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ACRONYMS

AIA	American Institute of Architects
ARC	American Red Cross
ARCGC	American Red Cross of Greater Chicago
ATC	Applied Technology Council
B/C	Benefit cost
BOCA	Building Officials Code Association
BOMA	Building Owners and Managers Association
CAP	Community Assistance Program
CAP-SSSE	Community Assistance Program-State Support Services Element
CDAP	Community Development Assistance Program
CDB/DBCR	Capital Development Board/Division of Building Codes and Regulations
CDBG	Community Development Block Grant
CERL	Construction Engineering Research Laboratory (part of USACE)
CFR	Code of Federal Regulation
CHIP	Capability/Hazard Identification Plan
CMS	Central Management Services
CTP	Cooperating Technical Partners
CUSEC	Central United States Earthquake Consortium
DA&P	Disaster Assistance & Preparedness
DCEO	Department of Commerce and Economic Opportunity
DC&W	Direction, Control and Warning
DHS	Department of Homeland Security
DMA2k	Disaster Mitigation Act of 2000
DOI	Division of Insurance
DRC	Disaster Resistant Community
EOP	Emergency Operations Plan
ESDA	Emergency Services and Disaster Agency (local)
FBFW	Flood Boundary Floodway
FCO	Federal Coordinating Officer
FEMA	Federal Emergency Management Agency
FHMO	Federal Hazard Mitigation Officer
FIRM	Flood Insurance Rate Map
FLASH	Federal Alliance for Safe Housing

ACRONYMS (continued)

FMA	Flood Mitigation Assistance
FY	Fiscal Year
GAR	Governor's Authorized Representative
GRF	General Revenue Fund
HM	Hazard Mitigation
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team (for non-flood disasters)
HRCQ	Highway Route Controlled Qualities
HUD	Housing and Urban Development
IA	Individual Assistance
IAFSM I	Ilinois Association of Floodplain and Stormwater Managers
IBA	Illinois Broadcasters Association
IBHS	Institute for Business and Home Safety
IBHS	Institute of Building and Home Safety
ICDB	Illinois Capital Development Board
IDFPR/DOI	Illinois Department of Financial and Professional Regulation/Division of Insurance
IDNDR	International Decade for Natural Disaster Reduction
IDNR-INHS	Illinois Department of Natural Resources - Illinois Natural History Survey
IDNR-OWR	Illinois Department of Natural Resources - Office of Water Resources
IDoA	Illinois Department of Agriculture
IDOT	Illinois Department of Transportation
IDPH	Illinois Department of Public Health
IEA	Illinois Education Association
IEMA	Illinois Emergency Management Agency
IEMMAS	Illinois Emergency Management Mutual Aid System
IEPA	Illinois Environmental Protection Agency
IHMT	Interagency Hazard Mitigation Team
IHPA	Illinois Historic Preservation Agency
ILARC	Illinois Association of Regional Councils
ILEAS	Illinois Law Enforcement Alarm System
IMAG	Interagency Mitigation Advisory Group
INA	Illinois Nurseryman Association
INHMP	Illinois Natural Hazard Mitigation Plan
INHMPC	Illinois Natural Hazard Mitigation Planning Committee
IPAM	Illinois Property Asset Management
IRCC	Illinois River Coordinating Council
ISBE	Illinois State Board of Education

ACRONYMS (continued)

ISGS	Illinois State Geological Survey
ISWS	Illinois State Water Survey (part of IDNR)
JFO	Joint Field Office
LCSMC	Lake County Stormwater Management Commission
LDD	Levee and Drainage District
MABAS	Mutual Aid Box Alarm System
MCSC	Mitigation Coordination and Strategy Committee
MERSWPC	Metro-East Regional Storm Water Planning Committee
MESD	Metro-East Sanitary District
MMIS	Modified Mercalli Intensity Scale (I thru XII)
MMMS	Map Modernization Management Support
MSD	Metropolitan Sanitary District - Chicago
MSDGC	Metropolitan Sanitary District of Greater Chicago (Now MWRD)
MWRD	Metropolitan Water Reclamation District - Chicago
NCDC	National Climatic Data Center
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NFIRA	National Flood Insurance Reform Act
NIBS	National Institute of Building Scientists
NIPC	Northeastern Illinois Planning Commission
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NSF	National Science Foundation
NTH	Natural and Technological Hazards (part of FEMA)
NWS	National Weather Service
OMB	Office of Management and Budget
OWR	Office of Water Resources (IDNR)
OSLAD	Open Space Acquisition and Development
PA	Public Assistance
PCWD	Prairie Central Watershed District
PDM	PreDisaster Mitigation
PDSI	Palmer Drought Severity Index
PI	Project Impact
PIO	Public Information Officer
PL	Public Law

ACRONYMS (continued)

POC	Point of Contact
PSA	Public Service Announcement
PVC	Polyvinyl Chloride
RACES	Radio Amateur Civil Emergency Service
RECD	Rural Economic and Community Development (former FmHA)
RFC	Repetitive Flood Claims
RR	Railroad
RWIS	Roadway Weather Information System
SBA	Small Business Administration, Department of Commerce
SBE	State Board of Education
SCO	State Coordinating Officer
SCS	Soil Conservation Service (now NRCS)
SHMO	State Hazard Mitigation Officer
SIMAPC	Southwestern Illinois Metropolitan and Regional Planning Commission
SIU	Southern Illinois University
SOP	Standard Operating Procedures
SRL	Severe Repetitive Loss
TARP	Tunnel and Reservoir Project (aka deep tunnel)
TBD	To Be Determined
TWP	Township
UBC	Uniform Building Codes
U/I, U-C	University of Illinois, Urbana-Champaign
USACE U.S.	Army Corps of Engineers
USEPA	U. S. Environmental Protection Agency
USGS	U. S. Geological Survey, Department of Interior

Instructions for Using the Plan Review Crosswalk for Review of Standard State Hazard Mitigation Plans

Attached is a Plan Review Crosswalk based on the ***Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000***, published by FEMA, with revisions dated November 2006. This Plan Review Crosswalk is consistent with the *Disaster Mitigation Act of 2000* (P.L. 106-390), enacted October 30, 2000 and *44 CFR Part 201 – Mitigation Planning, Interim Final Rule* (the Rule), published February 26, 2002.

SCORING SYSTEM

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a summary score of "Satisfactory." A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing.

Optional matrices for assisting in the review of sections on profiling hazards and assessing vulnerability are found at the end of the Plan Review Crosswalk.

The example below illustrates how to fill in the Plan Review Crosswalk.

Example

Assessing Vulnerability by Jurisdiction

Requirement §201.4(c)(2)(ii): *[The State risk assessment **shall** include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments … . The State **shall** describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard event.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan describe the State's vulnerability based on information from the local risk assessments?	Section III, pp. 12-28	The plan includes a description of local vulnerable structures. The plan presented a vulnerability summary by regions in the state. This information was collected from the approved plans on file.		✓
B. Does the plan present information on those jurisdictions that face the most risk?	Section III, pp. 30-36	The vulnerability description did not indicate which jurisdictions were the most vulnerable. **Required Revisions:** • Use the information provided in the summaries to determine which jurisdictions are most threatened by the identified hazards. • Identify which jurisdictions have suffered or are likely to suffer the most losses. • If data are not readily available, note these data limitations in the plan. Include actions in the mitigation strategy to obtain these data for the plan update.	✓	
		SUMMARY SCORE	✓	

Standard State Hazard Mitigation Plan Review and Approval Status

State Point of Contact: Bryan Purchis	Address: Illinois Emergency Management Agency 1035 Outer Park Drive Springfield, IL 62704
Title: State Hazard Mitigation Planner	
Agency: Illinois Department of Emergency Management	
Phone Number: 217-785-9888	E-Mail: Bryan.Purchis@Illinois.gov

FEMA Reviewer: Tom Smith	Title: Community Planner	Date: 9-9-2013
Date Received in FEMA Region [Insert #]	Various dates in June, July, August of 2013.	
Plan Not Approved	XX, pending adoption.	
Plan Approved		
Date Approved		

STANDARD STATE HAZARD MITIGATION PLAN SUMMARY CROSSWALK

The plan cannot be approved if the plan has not been formally adopted.

Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk. A "Needs Improvement" score on elements shaded in gray (recommended but not required) will not preclude the plan from passing. Reviewer's comments must be provided for requirements receiving a **"Needs Improvement"** score.

SCORING SYSTEM

Please check one of the following for each requirement.

N – Needs Improvement: The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.

S – Satisfactory: The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

Prerequisite	NOT MET	MET
Adoption by the State: §201.4(c)(6) and §201.4(c)(7)	X	

Planning Process	N	S
Documentation of the Planning Process: §201.4(c)(1)		X
Coordination Among Agencies: §201.4(b)		X
Program Integration: §201.4(b)		X

Risk Assessment	N	S
Identifying Hazards: §201.4(c)(2)(i)		X
Profiling Hazards: §201.4(c)(2)(i)		X
Assessing Vulnerability by Jurisdiction: §201.4(c)(2)(ii)		X
Assessing Vulnerability of State Facilities: §201.4(c)(2)(ii)		X
Estimating Potential Losses by Jurisdiction: §201.4(c)(2)(iii)		X
Estimating Potential Losses of State Facilities: §201.4(c)(2)(iii)		X

Mitigation Strategy	N	S
Hazard Mitigation Goals: §201.4(c)(3)(i)		X
State Capability Assessment: §201.4(c)(3)(ii)		X
Local Capability Assessment: §201.4(c)(3)(ii)		X
Mitigation Actions: §201.4(c)(3)(iii)		X
Funding Sources: §201.4(c)(3)(iv)		X

Coordination of Local Mitigation Planning	N	S
Local Funding and Technical Assistance: §201.4(c)(4)(i)		X
Local Plan Integration: §201.4(c)(4)(ii)		X
Prioritizing Local Assistance: §201.4(c)(4)(iii)		X

Plan Maintenance Process	N	S
Monitoring, Evaluating, and Updating the Plan: §201.4(c)(5)(i)		X
Monitoring Progress of Mitigation Activities: §201.4(c)(5)(ii) and (iii)		X

STANDARD STATE HAZARD MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED	XX
PLAN APPROVED	

See Reviewer's Comments

PREREQUISITE

Adoption by the State

Requirement §201.4(c)(6): *The plan **must** be formally adopted by the State prior to submittal to [FEMA] for final review and approval.*

Requirement §201.4(c)(7): *The plan **must** include assurances that the State will comply with all applicable Federal statutes and regulations in effect with respect to the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c). The State will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the State formally adopted the **new or updated** plan?				
B. Does the plan provide assurances that the State will **continue to** comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c), and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d)?	Chapter 1, ***Assurances***, p.I-2	OK		X
		SUMMARY SCORE		X

PLANNING PROCESS: *§201.4(b): An effective planning process is essential in developing and maintaining a good plan.*

Documentation of the Planning Process

Requirement §201.4(c)(1): *[The State plan **must** include a] description of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how other agencies participated.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan provide a narrative description of how the **new or updated** plan was prepared?	Chapter 2, ***INHMP Process***, pp. II-1 to II-2.	Meetings held November 15, 2012, April 16th, 2013, and July 25th, 2013.		X
B. Does the **new or updated** plan indicate who was involved in the **current** planning process?	Chapter 2, ***Illinois Natural Hazard Mitigation Plan Committee***, pp. II-5 to II-7.	Planning committee includes representatives of numerous state agencies, the American Red Cross, FEMA and the National Weather Service.		X
C. Does the **new or updated** plan indicate how other agencies participated in the **current** planning process?	Chapter 2, ***INHMP Process***, p.II-2	Agencies participated in committee meetings and representatives we interviewed on mitigation priorities on an individual department by department basis.		X
D. Does the updated plan document how the planning team reviewed and analyzed each section of the plan?	Chapter 2, ***INHMP Process***, pp. II-9 to II-12	Plan includes a summary entitled ***"2013 Updates/Changes to the 2010 INHMP"***		X

E. Does the updated plan indicate for each section whether or not it was revised as part of the update process?	Chapter 2, ***INHMP Process***, pp. II-9 to II-12	Most significant change was the addition of the statewide HAZUS analysis for flooding. Mitigation strategies were also updated and revised. Substantial improvements were made to the state's overall risk assessment.		X
		SUMMARY SCORE		X

Coordination Among Agencies

Requirement §201.4(b): *The [State] mitigation planning process* ***should*** *include coordination with other State agencies, appropriate Federal agencies, interested groups, and … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how Federal and State agencies were involved in the **current** planning process?	Chapter 2, ***Illinois Planning Process and Hazard Analysis and Risk Assessment***, pp. II-9 to II-10.	State agencies participated as members of the planning committee. The plan also provides a description of the capabilities of state agencies to conduct hazard mitigation. Finally, several state and federal agencies were relied on as the source of hazard data.		X
B. Does the **new or updated** plan describe how interested groups (e.g., businesses, non-profit organizations, and other interested parties) were involved in the **current** planning process?	Chapter 2, ***Illinois Planning Process and Hazard Analysis and Risk Assessment***, pp. II-9 to II-11.	**This is limited. Future updates should include outreach to private companies such as rural electrical cooperatives, to special districts such as sewer and water districts, and to hazard research institutes such as the Mid-America Earthquake Center at the University of Illinois.** **The state's mitigation strategies call for additional outreach to private companies, county and township road commissions, and various other interested parties.**		X
C. Does the updated plan discuss how coordination among Federal and State agencies changed since approval of the previous plan?	Chapter 2, ***Illinois Planning Process and Hazard Analysis and Risk Assessment***, pp. II-9 to II-11.	State has conducted meetings with state agencies most of these meetings were conducted as a one on one session.		X
		SUMMARY SCORE		

Program Integration

Requirement §201.4(b): *[The State mitigation planning process* ***should****] be integrated to the extent possible with other ongoing State planning efforts as well as other FEMA mitigation programs and initiatives.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how the State mitigation planning process is integrated with other ongoing State planning efforts?	Chapter IV, pp. IV-94 to IV-104	**As revised, this section includes a good description ongoing state planning programs and existing policies.**		X
B. Does the **new or updated** plan describe how the State mitigation planning process is integrated with FEMA mitigation programs and initiatives?	Chapter IV, Illinois Hazard Mitigation Funding Sources, pp. IV-74 to IV-80.	**As revised, the plan meets requirements. See Mitigation Strategies 2.5.2 and 2.53. The plan's description of funding sources makes it clear that it is coordinating its overall strategy and outreach with FEMA major mitigation programs.**		X
		SUMMARY SCORE		X

RISK ASSESSMENT: *§201.4(c)(2): [The State plan must include a risk assessment] that provides the factual basis for activities proposed in the strategy portion of the mitigation plan. Statewide risk assessments must characterize and analyze natural hazards and risks to provide a statewide overview. This overview will allow the State to compare potential losses throughout the State and to determine their priorities for implementing mitigation measures under the strategy, and to prioritize jurisdictions for receiving technical and financial support in developing more detailed local risk and vulnerability assessments.*

Identifying Hazards

Requirement §201.4(c)(2)(i): *[The State risk assessment **shall** include an] overview of the type … of all natural hazards that can affect the State … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the type of **all natural hazards** that can affect the State? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the State, this part of the plan cannot receive a Satisfactory score.	Chapter III. **Hazard Analysis and Risk Assessment,** p. III-1.	Plan covers severe storms, tornadoes, floods, severe winter storms, drought, extreme heat, earthquakes, dam failure, mine subsidence, influenza pandemic, and landslides.		X
		SUMMARY SCORE		X

Profiling Hazards

Requirement §201.4(c)(2)(i): *[The State risk assessment **shall** include an overview of the] location of all natural hazards that can affect the State, including information on previous occurrences of hazard events, as well as the probability of future hazard events, using maps where appropriate … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the risk assessment identify the **location** (i.e., geographic area affected) of each natural hazards addressed in the **new or updated** plan?	Chapter III, **Risk Analysis**, III-1 to III-152	Plan identifies the highest risk communities and counties for flooding. It highlights communities with levee failure risks. Plan identifies those counties at higher risk for drought, earthquakes, and other hazards.		X
B. Does the **new or updated** plan provide information on **previous**	Chapter III,	Plan provides a history of all major disaster declarations. It also		X

occurrences of each hazard addressed in the plan?	**Federal Disaster Declaration History,** III-2 to III-4;	provides a historical analysis for each hazard identified in the plan.		
C. Does the **new or updated** plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	Chapter II, **Illinois Hazard Rating Process**, page III-7	The plan defines probability in terms of the frequency of past occurrences. The plan examines the past history of events and ranks them low, medium or high probability.		X
		SUMMARY SCORE		X

Assessing Vulnerability

Requirement §201.4(c)(2)(ii): *[The State risk assessment **shall** include an] overview and analysis of the State's vulnerability to the hazards described in this paragraph (c)(2), based on estimates provided in local risk assessments as well as the State risk assessment. The State **shall** describe vulnerability in terms of the jurisdictions most threatened by the identified hazards, and most vulnerable to damage and loss associated with hazard events. State owned critical or operated facilities located in the identified hazard areas shall also be addressed … .*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Assessing Vulnerability by Jurisdiction

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the State's vulnerability based on estimates provided in local risk assessments as well as the State risk assessment?	Chapter III, **Hazard Identification and Risk Assessment**, pp. III-11 and III-14.	State plan compares and correlates state ranking with local rankings of hazards.		X
B. Does the **new or updated** plan describe the State's vulnerability in terms of the jurisdictions most threatened and most vulnerable to damage and loss associated with hazard event(s)?	Chapter III, **Hazard Identification and Risk Assessment**, page III-60;	Flooding is the state's most serious hazard and the plan provides a ranking of the top ten jurisdictions most vulnerable to flooding. The plan also ranks counties in terms of the most repetitive loss properties.		X
C. Does the updated plan explain the process used to analyze the information from the local risk assessments, as necessary?	Chapter V **Local Risk Assessment,** pp. V-33 to V-39.	**As revised, the plan meets requirements. The plan summarizes the highest rated risks locally and compares these ranking to the state's rankings.**		X
D. Does the updated plan reflect changes in development for jurisdictions in hazard prone areas?	See **Introduction**, page I-4.	Plan reviews statewide growth patterns and highlights the highest growth communities.		X
		SUMMARY SCORE		X

Assessing Vulnerability of State Facilities

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the types of State owned or operated critical facilities located in the identified hazard areas?	See **State Owned or Operated State Facility Methodology**, pp. III-154 to III-176	Plan identifies over 7,000 state facilities but the plan provides little or no information regarding the vulnerability of these facilities relative to significant hazards. The plan indicates that the state is continuing to collect information but is having difficulty identifying a data source for the addresses or locations of state facilities. **As revised, the plan does report on a selected number of state facilities at risk for flooding based on the statewide HAZUS analysis for flooding and the plan also examines FEMA's Public Assistance to state agencies following major disasters.**		X
		SUMMARY SCORE		X

Estimating Potential Losses

Requirement §201.4(c)(2)(iii): *[The State risk assessment **shall** include an] overview and analysis of potential losses to the identified vulnerable structures, based on estimates provided in local risk assessments as well as the State risk assessment. The State **shall** estimate the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities located in the identified hazard areas.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development…

Estimating Potential Losses by Jurisdiction

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present an overview and analysis of the potential losses to the identified vulnerable structures?	See **Hazard Identification and Risk Assessment**, III-32 to III-152	For each hazard there is a loss estimate. Most of these estimates are based on data from the National Climatic Data Center.		X
B. Are the potential losses based on estimates provided in local risk assessments as well as the State risk assessment?	See **LHMP-Best Practices**, pp.??	The state plan highlights local plans that provide detailed risk assessment information for several counties. This section should be expanded to highlight those areas of regions of the state with unique hazard risks—southern Illinois for earthquakes, maybe St Clair county for mine subsidence risks, Mississippi River communities for levee failure risks etc..		X
C. Does the updated plan reflect the effects of changes in development on loss estimates?	See **Introduction**, page I-4.	The plan highlights the increased risks and potential losses for the state's high growth communities.		X
		SUMMARY SCORE		X

Estimating Potential Losses of State Facilities

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present an estimate of the potential dollar losses to State owned or operated buildings, infrastructure, and critical facilities in the identified hazard areas?	Section III, Subsection K, **State-Owned and Operated State Facility Data Methodology,** pp. III-154 to III-167.	This is limited. Plan includes estimates of the total value of the identified state facilities. The statewide HAZUS analysis for flooding identified a number of state-owned buildings at risk for flooding. The plan correlates state-owned facilities with the level of risks at a county level. **As revised, the plan examines FEMA's Public Assistance to state agencies following major disasters.**		X
		SUMMARY SCORE		X

MITIGATION STRATEGY: *§201.4(c)(3) [To be effective the plan must include a] Mitigation Strategy that provides the State's blueprint for reducing the losses identified in the risk assessment.*

Hazard Mitigation Goals

Requirement §201.4(c)(3)(i): *[The State mitigation strategy **shall** include a] description of State goals to guide the selection of activities to mitigate and reduce potential losses.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of State mitigation **goals** that guide the selection of mitigation activities?	Chapter IV, ***Mitigation Strategy***, pp. IV-10 to IV-71	Plan identifies four overriding goals. For each of these goals the plan identifies objectives, strategies and actions.		X
B. Does the updated plan demonstrate that the goals were assessed and either remain valid or have been revised?	Chapter IV, ***Mitigation Strategy***, pp. IV-10 to IV-71	The overall goals have stayed similar and only small modifications were made to these goals. However, the strategies for achieving these goals have been expanded and refined.		X
		SUMMARY SCORE		X

State Capability Assessment ***Requirement §201.4(c)(3)(ii):*** *[The State mitigation strategy **shall** include a] discussion of the State's pre-and post-disaster hazard management policies, programs, and capabilities to mitigate the hazards in the area, including: an evaluation of State laws, regulations, policies, and programs related to hazard mitigation as well as to development in hazard-prone areas [and] a discussion of State funding capabilities for hazard mitigation projects … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan include an evaluation of the State's **pre-disaster** hazard management policies, programs, and capabilities?	Chapter IV, ***Illinois Mitigation Capability Assessment,*** pp.IV-92 to IV-97	The state's pre-disaster mitigation program promotes enforcement of the NFIP regulations; the acquisition of flood prone properties—nearly 3,500 to date; it has sponsored earthquake awareness efforts, and it promotes awareness on building more wind resistant construction.		X
B. Does the **new or updated** plan include an evaluation of the State's **post-disaster** hazard management policies, programs, and capabilities?	Section IV, Subsection B., ***Illinois Mitigation Capability*, pp. IV-94 to IV-104**	**As revised, the plan provides a description of the state's capabilities to respond to disasters including the state's legislative authority to promote response and recovery.**		X
C. Does the **new or updated** plan include an evaluation of the State's policies related to **development in hazard prone areas**?	Chapter IV, ***Illinois Mitigation Capability Assessment***, pp.IV-94 to IV-96.	The state administers flood plain regulations for state development projects through Executive Order 5 of 2006. The Capital Development Board Act as amended by Senate Bill 138 establishes a statewide building code for areas of the state without a building code. The bill provides minimum codes for commercial construction. Further, Executive Order 2 of 1990 requires consideration of seismic safety in the construction of new state facilities.		X
D. Does the **new or updated** plan include a discussion of State **funding capabilities** for hazard mitigation projects?	Chapter IV, ***Illinois Hazard Mitigation Funding Sources***, pp. IV-72 to IV-80 and ***Mitigation Strategy***, pp. IV-10 to IV-71	The plan describes state reliance on federal funding sources. The plan makes it clear that state and local governments are stretched to the limit in trying to undertake mitigation actions.		X
E. Does the updated plan address any hazard management capabilities of the State that have changed since approval of the previous plan?	Chapter IV, Illinois Mitigation Capability Assessment, pp.IV-97 to IV-	The plan indicates that the State Hazard Mitigation Office has conducted additional outreach to improve coordination and capabilities. Added outreach has been conducted with the American Red Cross, the Capital Development Board, the Illinois Department of Public Health and various other state agencies, boards and associations.		X

C.	100			
		SUMMARY SCORE		X

Local Capability Assessment

Requirement §201.4(c)(3)(ii): *[The State mitigation strategy **shall** include] a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan present a general description of the local mitigation policies, programs, and capabilities?	Chapter IV, ***Local Government Mitigation Capabilities***, pp. IV-143 to IV-148	State has been active in promoting local capabilities for planning. The state is creating a database of local hazard mitigation actions. This database will be used to assess and evaluate local programs and priorities.		X
B. Does the **new or updated** plan provide a general analysis of the effectiveness of local mitigation policies, programs, and capabilities?	Chapter 5, ***Coordination of Local Mitigation Planning***, V1- to V-12	**As revised, the plan highlights local government's commitment to hazard mitigation plan and it highlights local projects conducted to date.**		**X**
		SUMMARY SCORE		X

Mitigation Actions

Requirement §201.4(c)(3)(iii): *[State plans **shall** include an] identification, evaluation, and prioritization of cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering and an explanation of how each activity contributes to the overall mitigation strategy. This section **should** be linked to local plans, where specific local actions and projects are identified.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify cost-effective, environmentally sound, and technically feasible mitigation actions and activities the State is considering?	Chapter IV, Mitigation Strategy, pp. IV-10 to IV-71	Many of the state's mitigation priorities are low cost strategies—"improving staffing"; "better training"; "greater outreach"; "enhanced grants administration"; etc..		X
B. Does the **new or updated** plan evaluate these actions and	Chapter IV,	The plans provide a "rationale for action" for each of the state's		X

activities?	Mitigation Strategy Plus Funding, pp. IV-10 to IV-71	proposed strategies.		
C. Does the **new or updated** plan prioritize these actions and activities?	Chapter IV, ***Prioritizing Mitigation Action Items***, pp. IV-89 to IV-94	**As revised, the plan provides a good summary of the state's mitigation priorities.**		X
D. Does the **new or updated** plan explain how each activity contributes to the overall State mitigation strategy?	Chapter IV, Mitigation Strategy Plus Funding, pp. IV-10 to IV-71	The plan describes "how the action contributes to mitigation action" for each proposed action.		X
E. Does the mitigation strategy **in the new or updated** section reflect actions and projects identified in local plans?		***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		X

Funding Sources

Requirement §201.4(c)(3)(iv): *[The State mitigation strategy **shall** include an] identification of current and potential sources of Federal, State, local, or private funding to implement mitigation activities.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan identify **current** sources of Federal, State, local, or private funding to implement mitigation activities?	Chapter IV, ***Illinois Hazard Mitigation Funding Sources***, pp. IV-72 to IV-80	OK		X
B. Does the **new or updated** plan identify **potential** sources of Federal, State, local, or private funding to implement mitigation activities?	Chapter IV, **Mitigation Strategy Plans Funding,** pp. IV-10 to IV-90	OK		X
C. Does the updated plan identify the sources of mitigation funding used to implement activities in the mitigation strategy since approval of the previous plan?	Chapter IV, ***Illinois Hazard Mitigation Funding*** Sources, pp. IV-72 to IV-80	OK		X
		SUMMARY SCORE		X

COORDINATION OF LOCAL MITIGATION PLANNING

Local Funding and Technical Assistance

Requirement §201.4(c)(4)(i): *[The section on the Coordination of Local Mitigation Planning* ***must*** *include a] description of the State process to support, through funding and technical assistance, the development of local mitigation plans.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the State process to support, through funding and technical assistance, the development of local mitigation plans?	Chapter V, **Local Funding and Technical Assistance**, V-1 to V-4	OK		X
B. Does the updated plan describe the funding and technical assistance the State has provided in the past three years to assist local jurisdictions in completing approvable mitigation plans?	Chapter V, **Local Funding and Technical Assistance**, pp. V-1 to V-13	**OK**		**X**
		SUMMARY SCORE		X

Local Plan Integration

Requirement §201.4(c)(4)(ii): *[The section on the Coordination of Local Mitigation Planning* ***must*** *include a] description of the State process and timeframe by which the local plans will be reviewed, coordinated, and linked to the State Mitigation Plan.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **review** local plans?	Chapter V, pp.V-32 to V-56	**The description of the state's review of local plans emphasizes the substance of the review rather than the process. The state emphasizes a consistent methodology for risk assessments and risk ranking. The plan also describes the states technical assistance to local governments including its efforts to provide all counties with the results of its HAZUS analysis for flooding.**		X
B. Does the **new or updated** plan provide a description of the **process and timeframe** the State established to **coordinate and link** local plans to the State Mitigation Plan?	Chapter V, ***Local Plan Integration***, pp. V-26 to V-39	**The state's principal effort is promoting a hazard risk ranking system and risk analysis process that is consistent between the state and local plans.**		X

SUMMARY SCORE		X

Prioritizing Local Assistance

Requirement §201.4(c)(4)(iii): *[The section on the Coordination of Local Mitigation Planning **must** include] criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available funding programs, which **should** include consideration for communities with the highest risks, repetitive loss properties, and most intense development pressures.*

*Further, that for non-planning grants, a principal criterion for prioritizing grants **shall** be the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated costs.*

Requirement §201.4(d): Plan must be reviewed and revised to reflect changes in development, progress in statewide mitigation efforts, and changes in priorities…

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan provide a description of the criteria for prioritizing those communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs?	Chapter V, pp. V-14 to V-20	OK		X
B. **For the new or updated plan, do** the prioritization criteria include, for non-planning grants, the consideration of the extent to which benefits are maximized according to a cost benefit review of proposed projects and their associated cost?	Chapter V, pp. V-21 to V-23	OK		X
C. **For the new or updated plan, do** the criteria include considerations for communities with the highest risk?	Chapter V, ***Criteria of Planning Grants,*** pp. V-15 to V-16 and ***Non-Planning Grants,*** p.V-22	*OK*		X
D. **For the new or updated plan, do** the criteria include considerations for repetitive loss properties?	Chapter V, ***Non-Planning Grants,*** p.V-22	*OK*		X
E. **For the new or updated plan, do** the criteria include considerations for communities with the most intense development pressures?		***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		X

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan ***Requirement §201.4(c)(5)(i):*** *[The Standard State Plan Maintenance Process **must** include an] established method and schedule for monitoring, evaluating, and updating the plan.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe the method and schedule for monitoring the plan? (e.g., identifies the party responsible for **monitoring**, includes schedule for reports, site visits, phone calls, and/or meetings)	Chapter VI, Monitoring, Evaluating and Updating the Plan, pp. VI-1 to VI-4	OK		X
B. Does the **new or updated** plan describe the method and schedule for **evaluating** the plan? (e.g., identifies the party responsible for evaluating the plan, includes the criteria used to evaluate the plan)	Chapter VI, Monitoring, Evaluating and Updating the Plan, pp. VI-2 to VI-4	OK		X
C. Does the **new or updated** plan describe the method and schedule for **updating** the plan?	Chapter VI, Monitoring, Evaluating and Updating the Plan, pp. VI-1 to VI-4	OK		X
D. Does the updated plan include an analysis of whether the previously approved plan's method and schedule worked, and what elements or processes, if any, were changed?	Chapter VI, ***Monitoring Progress of Mitigation Activities***, pp.VI-5 to VI-9	**The plan highlights progress and improvements to the state planning process including added collaboration between state agencies and greater outreach to local governments.**		X
		SUMMARY SCORE		X

Monitoring Progress of Mitigation Activities ***Requirement §201.4(c)(5)(ii):*** *[The Standard State Plan Maintenance Process **must** include a] system for monitoring implementation of mitigation measures and project closeouts. Requirement **§201.4(c)(5)(iii):** [The Standard State Plan Maintenance Process **must** include a] system for reviewing progress on achieving goals as well as activities and projects in the Mitigation Strategy.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the **new or updated** plan describe how mitigation measures and project closeouts will be monitored?	Chapter VI, **Monitoring Progress for Mitigation Activities**, pp. VI-5 to VI-9.	OK		X
B. Does the **new or updated** plan identify a system for reviewing progress on achieving goals in the Mitigation Strategy?	Chapter VI,	OK		X

	Monitoring Progress for Mitigation Activities, pp. VI-5 to VI-9.			
C. Does the updated plan describe any modifications, if any, to the system identified in the previously approved plan to track the initiation, status, and completion of mitigation activities?	Chapter IV, **Local Government Mitigation Capability Assessment,** pp.IV-143 to IV-148	Plan indicates that the state has renewed efforts to establish a database on local hazard mitigation initiatives.		X
D. Does the **new or updated** plan identify a system for reviewing progress on implementing activities and projects of the Mitigation Strategy?	Chapter VI, **Monitoring Progress for Mitigation Activities**, pp. VI-5 to VI-9.	Plan indicates that the SHMO is responsible for monitoring progress in implementing the state plan.		X
E. Does the updated plan discuss if mitigation actions were implemented as planned?	Chapter VI, **Monitoring Progress for Mitigation Activities**, pp. VI-7 to VI-9.	The state has a large hazard mitigation program and limited staff. The plan indicates that the state is working on closing and completing mitigation actions undertaken in response to several disasters.		X
		SUMMARY SCORE		X

SEVERE REPETITIVE LOSS STRATEGY *(only required for 90/10 under FMA & SRL)*

Repetitive Loss Mitigation Strategy

Requirement §201.4(c)(3)(v): *A State may request the reduced cost share authorized under §79.4(c)(2) of this chapter for the FMA and SRL programs, if it has an approved State Mitigation Plan ... that also identifies specific actions the State has taken to reduce the number of repetitive loss properties (which* ***must*** *include severe repetitive loss properties), and specifies how the State intends to reduce the number of such repetitive loss properties.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the new or updated plan describe State mitigation goals that support the selection of mitigation activities for repetitive loss properties (see also Part 201.4(c)(3)(i))?	Chapter IV, **Goals, Objectives and Funding**, See Strategy 2.5.1, p. IV-38;	Identification and documentation of repetitive loss is a priority for the state.		X

B. Does the new or updated plan consider repetitive loss properties in its evaluation of the State's hazard management policies, programs, and capabilities and its general description of the local mitigation capabilities (see also Part 201.4(c)(3)(ii))?	Chapter IV, **Goals, Objectives and Funding**, See Strategy 2.5.3, p. IV-40; See also Chapter 5, Local Hazard Mitigation Strategy, pp.V-95 to V-98	The plan states that "the highest priority mitigation projects for the state are the acquisition of substantially damaged structures and repetitive loss properties". The plans analysis of local mitigation action indicates that the state has been successful in working with local jurisdictions on the acquisition of flood prone properties and repetitive loss properties.		X
C. Does the new or updated plan address repetitive loss properties in its risk assessment (see also Part 201.4(c)(2))?	Chapter III, pp. III-61 to III-71	**As revised, the plan identifies the counties with the most repetitive loss properties and it identifies the individual jurisdictions with the most repetitive loss properties.**		X
D. Does the new or updated plan identify, evaluate and prioritize cost-effective, environmentally sound, and technically feasible mitigation actions for repetitive loss properties (see also Part 201.4(c)(3)(iii))?	Chapter IV, **Goals, Objectives and Funding**, See Strategies: 2.5.1; 2.5.3; 2.6.4; 4.3.2 4.4.1	Plan calls for an inventory of repetitive loss properties; for maximizing the use of federal funds for acquiring repetitive loss properties; it calls for the use of state funds to support the local "match" for property acquisitions. The plan also calls for state support of the Illinois Association of State Flood Plain Managers and for state support for flood proofing workshops targeted to for flood prone properties.		X
E. Does the new or updated plan describe specific actions that have been implemented to mitigate repetitive loss properties, including actions taken to reduce the number of severe repetitive loss properties?	Chapter IV, **Mitigation Strategy Plus Funding,** p. IV-93	Illinois has had an aggressive program for acquiring flood prone and repetitive loss properties. The state plan reports that "since 1995 Illinois has dropped from 5th in the nation with 3,518 repetitive loss properties to 21st in the nation with 1,465 repetitive loss properties.		X
F. Does the new or updated plan identify current and potential sources of Federal, State, local, or private funding to implement mitigation activities for repetitive loss properties (see also Part 201.4(c)(3)(iv))?	Chapter IV, Illinois Hazard Mitigation Funding Sources, pp. IV-72 to IV-90	OK		X
		SUMMARY SCORE		X

Coordination with Repetitive Loss Jurisdictions

Requirement §201.4(c)(3(v): *In addition, the plan* ***must*** *describe the strategy the State has to ensure that local jurisdictions with severe repetitive loss properties take actions to reduce the number of these properties, including the development of local mitigation plans.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the new or updated plan provide a description of the State process to support, through funding and technical	Chapter V,	**As revised, the plan states that the "state has made it a**		X

assistance, the development of local mitigation plans in communities with severe repetitive loss properties (see also Part 201.4(c)(4)(i))?	Technical Assistance, p. V-2	**priority to work with local governments willing to act on the issue of repetitive loss properties."**		
B. Does the new or updated plan include considerations for repetitive loss properties in its criteria for prioritizing communities and local jurisdictions that would receive planning and project grants under available mitigation funding programs (see also Part 201.4(c)(3)(iii))?	Chapter V, ***Criteria of Planning Grants,*** pp. V-15 to V-16 and ***Non-Planning Grants,*** p.V-22	As revised, the plan is clear that participation in the NFIP is a priority for local planning grants and that reducing the number of repetitive loss properties is a priority for non-planning grants.		X
		SUMMARY SCORE		X

Matrix A: Profiling Hazards

This matrix can assist FEMA in scoring each hazard. States may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the State. **Completing the matrix is not required.**

Note: First, check which hazards are identified in requirement §201.4(c)(2)(i). Then, place a checkmark in either the N or S box for each ***applicable*** *hazard. An "N" for any element of any identified hazard will result in a "Needs Improvement" score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.4(c)(2)(i)	A. Location		B. Previous Occurrences		C. Probability of Future Events	
	Yes	N	S	N	S	N	S
Avalanche	☐	☐	☐	☐	☐	☐	☐
Coastal Erosion	☐	☐	☐	☐	☐	☐	☐
Coastal Storm	☐	☐	☐	☐	☐	☐	☐
Dam Failure	☐	☐	☐	☐	☐	☐	☐
Drought	☐	☐	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐	☐	☐
Expansive Soils	☐	☐	☐	☐	☐	☐	☐
Extreme Heat	☐	☐	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐	☐	☐
Hailstorm	☐	☐	☐	☐	☐	☐	☐
Hurricane	☐	☐	☐	☐	☐	☐	☐
Land Subsidence	☐	☐	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐	☐	☐
Levee Failure	☐	☐	☐	☐	☐	☐	☐
Severe Winter Storm	☐	☐	☐	☐	☐	☐	☐
Tornado	☐	☐	☐	☐	☐	☐	☐
Tsunami	☐	☐	☐	☐	☐	☐	☐
Volcano	☐	☐	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐	☐	☐

To check boxes, double click on the box and change the default value to "checked."

I. Introduction

A. Purpose

The contents of this Illinois Natural Hazard Mitigation Plan (INHMP) are intended to provide the framework for hazard mitigation not only during the recovery and reconstruction process, but on a year-round basis to identify current and proposed mitigation projects which will reduce the potential for future losses and decrease the costs to the taxpayers. The INHMP will be used to increase awareness and initiate development of long-range, interagency, multi-hazard mitigation activities to be administered by the Illinois Emergency Management Agency (IEMA) and the Interagency Mitigation Advisory Group (IMAG) for the State of Illinois.

B. Scope

The INHMP shall address those natural hazards that have resulted in claims for Federal assistance as well as other major natural hazards identified as presenting substantial risk to human life and private and public property. A joint decision was made between the Illinois Natural Hazard Mitigation Planning Committee (INHMPC) and IEMA to keep the plan focused on natural hazards. Separate efforts are in place for man-made hazards.

C. Authority

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended by (PL) 106-390 (Pre-Disaster Mitigation Program, Hazard Mitigation Grant Program and the Flood Mitigation Assistance Program - 44 CFR Part 78) addresses state mitigation planning, identifies new local mitigation planning requirements, authorizes Hazard Mitigation Grant Program (HMGP) funds for planning activities, and increases the amount of HMGP funds available to states that develop a comprehensive, enhanced mitigation plan. The Disaster Mitigation Act of 2000 (DMA 2000) emphasizes the importance of strong state and local planning processes and comprehensive program management at the state level with a link in the planning process between the state and local mitigation programs. The Federal Emergency Management Agency (FEMA) has promulgated rules for implementation in 44 CFR Parts 201 and 206.

The Illinois Emergency Management Agency Act created IEMA and its authority to develop, plan, analyze, conduct, provide, implement and maintain programs for disaster mitigation, preparedness, response and recovery. (20 ILCS 3305/5) Further, the Illinois Administrative Code restates the IEMA mandate to prepare the State of Illinois to deal with disasters, to preserve the lives and property of the people of the State and to protect the public peace, health and safety in the event of a disaster. (29 Ill. Adm. Code 301.110)

D. Assurances

The State of Illinois will comply with all applicable Federal statutes and regulations during the periods for which it receives grant funding, in compliance with 44 CFR 13.11(c) and will amend its plan whenever necessary to reflect changes in State or Federal laws and statutes as required in 44 CFR 13.11(d).

E. Geographic Characteristics of Illinois

The State of Illinois covers an area of 56,400 square miles. Illinois extends from 36.9540° to 42.4951° North Latitude and from 87.3840° to 91.4244° West Longitude. The State is approximately 385 miles long and 218 miles wide, with its geographic center located in the town of Chestnut. Illinois ranks as the 25th largest state in reference to total land and water area in the nation. Illinois contains over 55,583 square miles of land with approximately 700 square miles of inland water. Carlyle Lake (24,580 acres) and Rend Lake (18,900 acres), two of largest lakes in Illinois, make up a substantial amount of that total. Elevations in the State range from the lowest level at the Mississippi River at Cairo (279 feet above mean sea level) to the highest point Charles Mound (1235 feet above mean sea level). The largest cities in Illinois are: Chicago, Aurora, Rockford, Joliet, Naperville, Springfield and Peoria. The State of Illinois is bordered by the states of: Indiana, Iowa, Kentucky, Missouri, Wisconsin, and Michigan (in Lake Michigan).

F. Climatic Characteristics of Illinois

The climate of Illinois is controlled by many factors, but the two main factors that primarily account for shifts in temperature and precipitation are the sun and weather systems. In his paper Climate of Illinois, published in 2003, Mr. Jim Angel, Climatologist, Illinois State Water Survey explains how these factors affect Illinois climate. *"The sun, the primary energy source for virtually all weather*

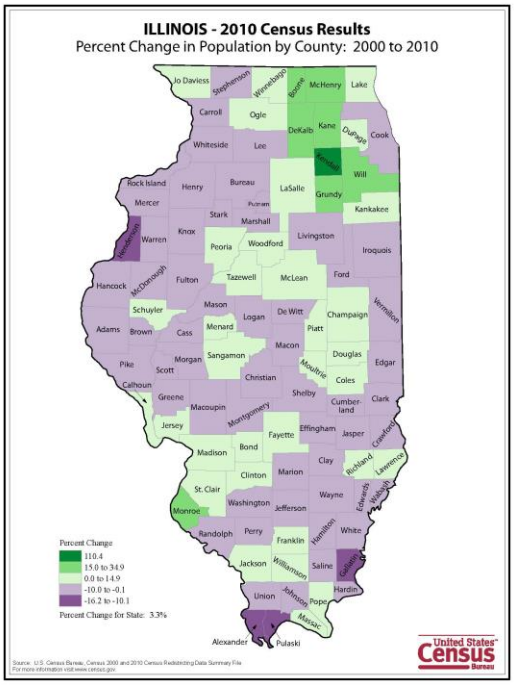
phenomena, in large part determines air temperatures and seasonal variations. Solar energy is three to four times greater in early summer than in early winter at Illinois' mid-latitude location; which results in warm summers and cold winters when combined with the state's inland location." The next factor is weather systems. They *"create the wide variety of weather conditions that occur almost daily as a result of varying air masses and passing storm systems. The polar jet stream often is located near or over Illinois, especially in fall, winter, and spring, and is the focal point for the creation and movement of low-pressure storm systems characterized by clouds, winds, and precipitation. The settled weather associated with high pressure systems is generally ended every few days by the passage of low-pressure."* (Angel 1)

> Average annual temperatures ranges from 48°F (north) to 58°F (south), with highs ranging from 57°F (north) to 67°(south). Average winter highs range from the 30s (north) to the mid-40s (south), while average lows range from the teens (north) to the upper 20s (south). Average summer highs are in the 80s, while lows are in the 60s across the state. Both spring and fall have more moderate temperatures. Average spring highs range from 57°F (north) to 67°F (south), while average lows range from 36°F(north) to 48°F (south). Average fall highs range from 60°F(north) to 70°F(south), while average lows range from 40°F (north) to 48°F (south).
>
> Illinois averages 10 days at or above 90°F(north) compared to just over 40 days (south). Days at or above 100°F are quite rare, occurring about every other year (north) and 2 days annually (south). Days at or below 0°F ranges from 16 days annually (north) to 2 days (south) . . . The highest and lowest temperatures ever reported in Illinois were 117°F in East St. Louis on July 14, 1954 and -36°F in Congerville on January 5, 1999 .
>
> Average precipitation exceeds 48 inches a year (south), compared to less than 32 inches (north). Snowfall distribution is just the opposite, with averages of 36 inches a year in the (north) and less than 10 inches (extreme southern Illinois). Winter snowfall is heaviest in the Chicago area, enhanced

by lake-effect snows from Lake Michigan. The greatest 24-hour rainfall was 16.94 inches at Aurora on July 17-18, 1996. The greatest one-year precipitation was 74.58 inches at New Burnside in 1950. The greatest 24-hour snowfall was 37.8 inches at Astoria on February 27-28, 1900. The greatest winter snowfall was 105.1 inches at Antioch in 1978-1979. (Angel 2-3)

G. Demographic Characteristics of Illinois

According to the U.S. Census Bureau the population of Illinois is estimated at 12,830,632 making Illinois the fifth most populous state in the Nation. Based on numbers found in the 2010 Census, Cook is the largest county with a population of 5,194,675. Its population decreased by 3.4 percent since 2000. The other counties in the top five populations include; DuPage, with a population of 916,924 (increase of 1.4 percent); Lake, 703,462 (increase of 9.2 percent); Will, 677,560 (increase of 34.9 percent); and Kane, 515,269 (increase of 27.5 percent). The population of Illinois has increased by 9.7% since 2000. Five counties have experienced a population increase of 25% or greater since 2000. These counties include: Boone, Kane, Kendall, Grundy and Will. Kendall County has experienced an increase in population of over 110 percent making it the fastest growing county in Illinois. Three counties experienced a population increase from 15 percent to 25 percent including: McHenry, DeKalb and Monroe. Twelve additional counties experienced a population increase of 5 percent to 15 percent in the state. These counties were represented in a variety of locations throughout the state. The majority of the counties that experienced 25 percent or greater growth were located in the North-Eastern section of the state. However, the additional counties experiencing growth were located in all portions of the state, providing no correlation to geographical location. The remaining 82 counties experienced less than 5 percent growth or negative growth.



H. Mitigation Success Stories in Illinois

An independent study completed in 2005 by the Multi Hazard Mitigation Council documented that for every dollar spent on hazard mitigation there are four dollars in benefits. Beyond the economic savings to individuals and the government, the prevention of human suffering is the greatest accomplishment of the mitigation programs. Homes can be rebuilt and objects can be purchased, but disasters disrupt lives and destroy family keepsakes, like photos, that are priceless.

The State of Illinois has been very successful with significant opportunities to reduce and/or eliminate potential losses to state and local assets though numerous State hazard mitigation planning and project efforts. With the combined energies of multiple Federal and State resources we have taken a proactive approach to our common goal of reducing the risk of loss of life and property due to natural hazards in Illinois. While all mitigation efforts must be a continual effort, the State's efforts have shown results. Many community officials, especially those in heavily mitigated communities, have expressed great relief at the lack of stress during major flooding events. To them, what use to be a weeks-long headache and hassle has become a "non-event." The difficulty in making people understand the success of mitigation is that nothing happening is really a major success.

Below provides a highlight of some of the successful mitigation projects or efforts that have occurred within the State of Illinois. These mitigation actions are vital in the success of reducing or eliminating the impacts of the hazards that effect the State of Illinois and it's population.

Mitigation Success Stories

Floodplain Mitigation (IEMA) & (IDNR)

With flooding causing the greatest financial impacts within the State, it is important to continually attempt to mitigation this hazard and limit these costly impacts. The State of Illinois flood mitigation efforts have and continue to be very proactive and successful. The Illinois Emergency Management Agency with the cooperation of the Illinois Department of Natural Resources has mitigated approximately 3,800 structures and parcels of land since 1993, through the following efforts:

- **Property Acquisition and Structure Demolition –** The voluntary acquisition of an existing at-risk structure and, typically, the underlying land, and conversion of the land to open space through the demolition of the structure. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.
- **Property Acquisition and Structure Relocation –** The voluntary physical relocation of an existing structure to an area outside of a hazard-prone area, such as the Special Flood Hazard Area (SFHA) or a regulatory erosion zone and, typically, the acquisition of the underlying land. The property must be deed-restricted in perpetuity to open space uses to restore and/or conserve the natural floodplain functions.
- **Structure Elevation –** Physically raising an existing structure to the Base Flood Elevation (BFE) or higher if required by FEMA or local ordinance. Structure elevation may be achieved through a variety of methods, including elevating on continuous foundation walls; elevating on open foundations, such as piles, piers, posts, or columns; and elevating on fill. Foundations must be designed to properly address all loads and be appropriately connected to the floor structure above, and utilities must be properly elevated as well.

These flood mitigation efforts continue to grow in success with the new addition of the Department of Commerce and Economic Opportunity as a mitigation partner. The success of these efforts is seen with the continual decline of the State's repetitive flood insurance claims. In 1995, Illinois was ranked #5 in the nation for repetitive flood insurance claims. In 2012, Illinois has dropped to #21 in the nation.

Bridge Scour Monitoring System (IDOT)

The Illinois Department of Transportation has implemented a program that has evaluated bridges over waterways for their scour potential. Scouring is the erosion of soil from around the bridge support pillions. This soil erosion can cause structural damage to the bridge supports. On identified bridges, a monitoring system has been installed that will alarm if damaging scouring activity occurs. The system is monitored 24 hours a day, with emergency notification to personnel and allows for the agency to continually analyze the scouring risk and institute activities to mitigate the impact of the scouring if required.

CDBG Disaster Recovery "IKE" Program (DCEO)

The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009 (Pub. Law 110-329), enacted on September 30, 2008, appropriated $6.5 billion dollars through the Community Development Block Grant (CDBG) program for "necessary expenses related to disaster relief, long-term recovery, and restoration of infrastructure, housing, and economic revitalization in areas affected by natural disasters occurring during 2008 for which the President declared a major disaster. The Illinois Department of Commerce and Economic Opportunity (DCEO), working closely with the Illinois Emergency Management Agency (IEMA), the Illinois Housing Development Agency (IHDA) and inviting input by communities, individuals and other interested parties, have developed an action plan that outlines the eligible activities available to assist counties to address these mitigation and critical restoration needs.

Illinois Department of Natural Resources/Office of Water Resources (OWR) Matching Funds

The Illinois Department of Natural Resources/Office of Water Resources (OWR) has a long history of flood mitigation. Starting in the 1970s the OWR accomplished early flood mitigation buyouts in some of the state's most flood prone areas. Buyouts took place in Thebes, Kampsville, Peoria Heights, and Peoria County. In the subsequent years, dozens of floods have taken place at these mitigation project sites. The program has paid for itself many times over in loss avoidance. These early buyouts set the stage for later programs. After the 1993 flood, the OWR program was used largely as the local cost share match for FEMA's 75%/25% funding. The availability of state matching funds has made the FEMA program much more widely accepted by local communities. More recently, OWR has taken on larger projects (such as Alexander County) to make available "global match" funds to match FEMA mitigation funding.

Statewide Health Department Risk Assessments (IDPH)

The Illinois Department of Public Health in conjunction with the Center for Disease Control has assisted in the development of Hazard Vulnerability Assessments (HVA) for all local county Health Departments within the State of Illinois. These HVA's have been completed statewide in 2012 and have enabled IDPH to assess and rank specific hazards that impact the public health sector.

Community Rating System (IDNR)

The Community Rating System (CRS) is a voluntary program which provides incentives in the form of premium discounts for communities which go above-and-beyond minimum floodplain management standards. The State of Illinois is very proud of the way communities have embrace the Community Rating System (CRS). Illinois leads the nation in participation for non-coastal states and is ranked 6th overall in the United States with 56 CRS communities. Illinois also has ten communities that have achieved a Class 5 rating which results in a 25% reduction in flood insurance premiums. This distinction ranks us 3rd nation-wide and 1st for non-coastal communities. Not only do we have the largest number of CRS communities among inland states, we are also national leaders when it comes to floodplain management. The citizens of Illinois will realize nearly $1.5 million in savings due to CRS. Based strictly on Illinois' state regulations, every community in the state could be achieving a 10% reduction in flood premiums simply by joining CRS. This speaks loudly of everyone who works with floodplain management in Illinois.

Business Emergency Operation Center (IEMA)

The Business Emergency Operation Center (BEOC) is a private sector emergency operation center the brings representatives from the following sectors into cooperation with State Emergency Management Personnel: agriculture and food; retail; energy; information technology; postal and shipping; bank and finance; communications, transportation systems; chemical; manufacturing; healthcare and public health, water; security; small business; and service industry. The BEOC will offer a physical location where representatives from 15 sectors of the private sector can report following a major disaster. The collaboration between the private sector and state emergency management personnel will not only improve response and recovery efforts for major disasters, but has built that connection to develop mitigation strategies to enhance the resiliency of the private sector, ultimately strengthening the State's mitigation efforts.

Illinois Flood Plain Summary (IDNR)

The Illinois Department of Natural Resources Office of Water Resources created an Illinois Flood Plain Summary document to highlight the continuing floodplain efforts including flood mitigation for the State of Illinois. This document provides information for not only state agencies but the general public in regards to floodplain related mitigation efforts in Illinois and the success the programs

have had. Nearly 4.4 million acres or 12% of the entire land area of Illinois is mapped as floodplain. Illinois is ranked 5th in the nation for total number of participating communities in the National Flood Insurance Program. Of the 3,518 repetitive loss properties throughout Illinois nearly half (1,465) have been mitigated, with the NFIP saving more than $1.5 million annually. Illinois has been incredibly successful in the purchase of flood prone properties with nearly 3,800 being purchased since 1993.

IDOC Earthquake Response and Preparedness Plan (IDOC)

This plan identifies specific correctional institutions within the State of Illinois that are located near major known fault zones. IDOC has created institution specific plans that assess proper preparation to establish communication links, to provide rapid response, to provide quick assessment of damages, and to provide security to all affected Institutions following a significant earthquake. These plans have been developed to limit the impact of an earthquake on those housed and work in these facilities.

Illinois Drought Report (ISWS)

Drought is a common natural phenomenon that can lead to a natural disaster. There are still public health concerns with drought, primarily associated with water quality and proper disinfection as well as the effects of prolonged heat waves that commonly occur during severe drought periods. There are also serious economic impacts of drought with damages to crops or damages resulting from an interruption in available water supply. Every drought is different in its intensity, duration, timing, and impacts. In October of 2011 the State Water Plan Task Force (SWPTF) updated Illinois' Drought Preparedness and Response Plan is to assist community and state officials and the public with information and tools that promote better decision-making in water supply planning and reduce drought-related impacts, water competition, and conflicts of use. The SWPTF created a drought plan that was dynamic and easily updated as new information becomes available.

Illinois Association for Floodplain and Stormwater Management (ISFSM)

The Illinois Association for Floodplain and Stormwater Management (IAFSM) represents over 600 floodplain managers, engineers, local officials, insurance agents, and state and federal agency staff. IAFSM was founded in 1986 and has grown to be one of the largest state floodplain associations in the nation. IAFSM objectives are to:

- Promote the common interest in floodplain and stormwater management
- Enhance cooperation among various local, state, and federal agencies
- Encourage effective and innovative approaches to managing the State's floodplain and stormwater management systems

Throughout the year, IAFSM conducts several training events and publishes a newsletter to inform members on important topics such as current legislation, local activities, hazard mitigation, new state and federal programs, publications, conferences, workshops, and job openings. Each spring, the IAFSM holds an Annual Conference. Its location varies throughout the State. In recent years, attendance at the annual conference has been 600- 700 local floodplain managers. The IAFSM has become one of the best sources to promote flood awareness and provide outreach on flood programs.

HAZUS-MH Reports for Individual Counties (IEMA)

Hazard Mitigation Grant Program funds were utilized to conduct a state-wide Level 1.5 HAZUS analysis to develop a risk assessment focused on defining the potential flood exposure throughout the 102 counties in Illinois. This project identified critical and essential facilities located within the 100-year floodplain. A flood vulnerability report for each of the 102 Illinois counties was generated by Southern Illinois University. The report reviewed previous occurrences of flooding in the county, identified the FEMA mapped floodplains, summarized the flood-exposure modeling results and identified any critical facilities susceptible to flooding. Copies of these county reports were distributed to the individual counties to assist with their future mitigation planning efforts.

State Threat Hazard Identification Risk Assessment (IEMA & ITTF)

The State of Illinois completed a FEMA approved Statewide Threat Hazard Identification Risk Assessment (THIRA) that was consistent with the CPG-201 and expanded on nationally accepted emergency management standards, which have long required using risk assessments, such as HIRAs, as the basis for planning across the mission areas. IEMA and the Illinois Terrorism Task Force Strategic Planning Cell combined to review the risk of hazards within the State of Illinois. During the THIRA process, numerous plans and studies were reviewed to ensure consistency and accuracy of the information provided in the document. Some of the plans reviewed included the State Natural Hazard Mitigation Plan, State Natural Hazard Risk Assessment, State Technological Hazards Mitigation Plan, State Human Caused Hazards Mitigation Plan, State Emergency Operation Plan, State Recovery Plan, State Mass Fatalities Plan, National Climate Data Center documents, past incident response situation reports and public assistance documents. The continuous cycle of assessing the State's capabilities, plans, and programs while incorporating these results into future THIRAs will allow the State to mitigate the impact to potential identified risks, while provided the means to educate and update individuals, families, businesses, organizations, community leaders, and senior officials on the risks facing a community in an effort to provide an avenue for building required capabilities and creating a secure and resilient community.

Fire Stopper (ARC)

One of the major functions carried out by the American Red Cross is assisting disaster victims recover after home fires. In an effort to mitigation some of these devastating fires the ARC has developed the "Team Fire Stopper" program. The program offers, simple steps that individuals can take to protect their home and family from fire. This program focuses on previous occurrences within communities that are disproportionately affected by fires and provides education and hands-on community fire prevention activities to make the communities more resilient by conducting in-home visits and safety fairs. The ARC reaches thousands of households annually and conduct hundreds of household visits to mitigate these house fires.

City of Rockford Buy-Out

The City of Rockford was experiencing frequent urban residential flooding as a result of decades of shifting land use and development. Ultimately it became clear that a comprehensive flood mitigation plan was needed, which included the acquisition and demolition of the most flood prone structures, and major upgrades to drainage systems in the affected areas. The City of Rockford successfully applied for and received $2,425,731 in Hazard Mitigation Grant Program Federal funds that were utilized to purchase 38 homes in the Keith Creek floodplain. This is a continuation of the successful FEMA-1681 project. The benefit/cost for this project was 1.287, using the same methodology as the approved FEMA 1681 project. The 38 homes were demolished with deed restrictions applied to the land.

Lake County Stormwater Management Program

The first County Comprehensive Stormwater Management Plan was adopted in 1990. The Lake County Stormwater Management Commission (SMC) has also developed a number of watershed-based plans for four major watersheds in the county. These detailed plans have incorporated a variety zoning ordinances, building codes and watershed regulations to provide successful mitigation efforts. The Lake County Watershed regulations established minimum countywide standards for stormwater management, including floodplains, detention, soil erosion/sediment control, water quality treatment, and wetlands. A number of County municipalities have incorporated floodplain development restrictions into their zoning ordinances.

City of Streator Stream Bank Stabilization and Property Acquisition

The City of Streator was provided Hazard Mitigation Grant Program Federal funds in the amount of $565,600 to be used toward steam bank stabilization work and property acquisition which was the result of a 2007 landside. A portion of the Vermilion River bank collapsed causing a massive landslide. The landslide affected two buildings in Streator and caused fear of future landslides. The stabilization work entailed removal of material from the Vermilion River, re-grading of the current river bank and installation of Gabion baskets to provide protection from future erosion. One structure was successfully purchased. Unfortunately, due to environmental concerns, the second structure could not be purchased until clean-up was completed.

Creal Springs School District Code Plus Construction

The Marion Community Unit School District No. 2 completed an enhancement of it's Pre-Kindergarten through 8th Grade school near the community of Creal Springs utilizing $433,989 in Federal Funds under the Hazard Mitigation Grant Program. The project included seismic enhancements to the structural, architectural, mechanical, electrical, fire protection, hydronic, and plumbing component of the school as well as the construction of a safe room and addition of an emergency generator. Throughout the school seismic steel frame columns and beams were installed. The acoustic panel ceilings included addition of galvanized steel support channels and hangers sized and suited for seismic sizing. The electrical system was upgraded to include seismic connections for lights and conduits that included inertia bases, conduit transverse bracing, conduit longitudinal bracing, and seismic fixture clips. The fire protection and hydronic system upgrades included seismic support and flexible connections for piping as well as flexible connections at the fire protection entrance. Additionally, the hydronic system was upgraded to include seismic support and flexible connections for water piping, a flexible connection at the water entrance, and seismic bracing form plumbing equipment.

Rend Lake Water Bypass

Rend Lake Conservancy District received a grant of $1,864,680 toward a total cost of $2,362,005 to build a water bypass. The current water pipe serves the City of Mt. Vernon and several smaller jurisdictions, a total of more than 50,000 people. When Rend Lake was created an error in design allowed the lake to expand past the originally designed location. This resulted in the water pipe being submerged under the lake. The lake is located in between the New Madrid and Wabash Valley fault lines and is very vulnerable to an earthquake. If the line was to be damaged, the quickest solution would be to build a bypass; trying to access and repair the pipe at the bottom of the lake would take even longer. Until the post-earthquake bypass would be built, the 50,000 customers including several major employers and hospitals would be without water.

This project built a bypass to the existing water pipe, to provide redundancy in case of an earthquake or another type of break. If the bypass would suffer from a break, because it is not under a lake, the repairs could be made within a day.

Carol Stream Property Acquisitions

The City of Carol Stream applied to IEMA for HMGP mitigation funds to acquire four properties that were classified as repetitive loss properties on the Klein Creek. Four homes were purchased with federal funds in the amount of $758,000. The homes were demolished with deed restrictions applied to the land.

Machesney Park Acquisitions

Machesney Park was awarded 2.5 million dollars from the HMGP program and acquired 26 flood-prone structures on the Rock River, and converted the property into open space. Twenty-six homes were demolished with deed restrictions applied to the land.

Keithsburg Acquisitions

Keithsburg was one of the first major buyouts in Illinois after the 1993 flood. We purchased 111 properties for just over $2 million dollars. In the early 2000's the City approached us about re-using the acquired properties to build a new manufacturing plant. They were turned down. In 2008 at Keithsburg, the Mississippi exceeded its previous record in 1993 and there were 111 fewer properties to be impacted.

The City also received a grant from FEMA to relocate Central School. If the school was still located in its old location it would have received several million dollars in damages and several hundred students would have been displaced.

The City rebuilt their sewer plant five years ago. At the time the engineers had the back-up generator located at ground level. City zoning official, Mike Sutfin, had to stand his ground and insist that the generator would be placed on a pedestal about seven feet off the ground. In this year's flood, the water was at least four feet up the pedestal. Without this, the generator would have been lost and the losses would have been in the millions.

Jersey County Army Corps Sites

The Army Corps controls land on the river side of levees and leases sites to private individuals to build structures on them. These structures are extremely vulnerable because of their location and there have always been issues in enforcing floodplain regulations on the property. The Army Corps said that home owners cannot purchase flood insurance but that it was FEMA's job to enforce the rule and FEMA said the Army Corps had to enforce it. Local jurisdictions did not think it was their responsibility to enforce the NFIP rules because it was Army Corps land. As a result there were more than 230 structures on Army Corps land that were listed on the State's rep loss list. This was almost 90% of the rep loss properties in the state and the average structure had made six NFIP claims. About two thirds of these properties were located in Jersey County.

The State worked toward a solution for more than 15 years. Attempts to purchase the properties were ruled ineligible because they were on federally owned land. Finally through the concerted efforts of the State Floodplain Manager, Paul Osman, and the difficult work of the local floodplain manager, Mike Prough, the structures were declared substantially damaged and were either torn down or elevated using ICC funds. At this point virtually all of these rep loss properties have been mitigated and were unaffected by this year's flooding.

Ottawa Acquisitions

Ottawa has had multiple successes with mitigation. The biggest success is the acquisition of structures in the area known as the flats. The acquisition project started after the flood of 1996 and has received funding through IEMA, IDNR, and DCEO. The final of 70 structures was purchased this year and the area is the site of a beautiful park. The park flooded again this year to record levels, but the 70 homes were no longer in harm's way.

Past Mitigation Success Stories

Whereas current successful mitigation projects are vital to continued reduction or elimination of risk to people and property from natural hazards and their effects, so are the sustained actions of those that have long-term impact. It is important to highlight and see how past mitigation success stories continue to be successful. Below is a list of past mitigation success stories that continue to provide long-term solutions to the risks to the State's hazards.

Southern Illinois PDM Planning Grant – (Updated)

A Pre-Disaster Mitigation Grant totaling nearly $1 million was awarded to 17 counties in Southern Illinois to aid in the development of a Multi-jurisdictional Hazard Mitigation Plan. These plans use a variety of GIS modeling programs to accurately portray the risks to the geographic area. The data collected during the planning process has given each participating jurisdiction a wealth of information that will continue to help them prepare for, respond to, and mitigate the effects of natural disasters. The plans developed from this PDM Grant continue to serve these Southern Counties and have led to a number of mitigation projects and applications. One of the most significant is being the approval of an application for acquisition of 167 properties and 4 structure elevations in Alexander County.

Keep Cool/Keep Warm Illinois (IDPH) & (DCEO) – (Updated)

The Illinois Department of Public Health has launched outreach campaigns intended to help residents safely weather severe temperatures. Through the Keep Cool Illinois and Keep Warm Illinois websites and hotlines, IDPH has made available tips for keeping temperatures comfortable, guidelines for safe and responsible outdoor activities during extreme temperature events, and resources for assisting individuals with utility bills and finding emergency cooling or heating centers. IDPH annually continues to supply and update this important material, while the Department of Commerce and Economic Opportunity continues to provide financial support to individuals requiring assistance with heating and cooling bills.

Earthquake Resistant Construction (IEMA) – (Updated)

$659,238 of the HMGP funds were provided to the Waterloo School District to ensure the new High School was built to be seismically resistant. The construction of the new school was completed in 2010 which included upgrades meeting FEMA 424 seismic guidelines for structural, architectural, mechanical, electrical, fire protection, hydronics and plumbing standards. The project included the installation of an emergency electric generator for lights, heating/cooling and sewage lift stations. This school is in the heart of the Waterloo community and will provide a safe shelter for a student body of over 1400 student but also act as an emergency shelter for the community if needed during an earthquake or high wind event. Precast concrete panel exterior bearing walls were utilized for the exterior gymnasium-multipurpose room walls. In addition to the wind/earthquake resistant structural system design, a backup generator sized to allow for emergency lighting, food service operations and minimal space power. These mitigation actions were designed with the intent of providing life safety, structure protection, contents protection and continuity of function for the facility.

Drought Planning (ISWS) – (Updated)

The Illinois State Water Survey has created a framework for drought and water supply planning. The ISWS publications Drought Planning for Small Community Water Systems and The Water Cycle and Water Budgets in Illinois examine the risks faced by community water supplies during drought events and present a framework for planning to meet those events with reduced economic and social impact. The Illinois State Water Survey continues to work with the Drought Response Task Force in an effort to monitor the conditions of the state's water resources and coordinate the state's response to drought impacts. The Drought Response Task Force has established the following website to help Illinois residents make smart choices in response to drought conditions: http://www2.illinois.gov/gov/drought/Pages/Comments.aspx

Critical Bridge Seismic Hardening (IDOT) – (Updated)

The Illinois Department of Transportation is implementing a program to enhance the seismic resistance of high-risk bridges located at key positions in the State's transportation infrastructure. Many bridges have already been retrofitted, while additional bridges are continuing to be retrofitted.

Earthquake Study (IEMA) – (Updated)

IEMA had funded a project by the Mid-America Earthquake Center to conduct a Comprehensive Seismic Loss Assessment for the State. The Assessment is complete and is providing insight into the damages the State can expect in a major earthquake event along the New Madrid or Wabash Valley faults. These insights have been incorporated into the State's efforts to plan and prepare for these disasters, and how to best direct mitigation efforts. Specific portions of this comprehensive report have been added to the 2013 plan update.

Lightning Safety Awareness (NWS & IEMA) – (Updated)

The National Weather Service office in Lincoln has worked with IEMA to enhance public awareness of lightning hazards and safe practices. A Lightning Safety Awareness Week was held June 24 – 30, 2007 and an educational booklet, Lightning Safety Awareness was developed to disseminate lightning safety information. The public awareness campaigns have expanded over the past 3 years with the addition of monthly campaign's dealing with hazard specific mitigation and preparedness for the general public. These monthly campaigns are run during the appropriate time periods associated with the specific hazard on the "Ready Illinois" webpage: http://www.illinois.gov/ready/Preparedness/Pages/default.aspx These month long campaigns include: Hazard Mitigation, Earthquake Preparedness, Severe Weather Preparedness, Heat Safety and Winter Storm Preparedness.

Improved Coordination between State and Federal Agencies – (Updated)

The planning process for the initial State mitigation plan improved the relations between the different State agencies and between the State and Federal agencies. By working together on the plan, connections were formed that were useful in the past. For example, IEMA worked with the NWS on the lightning awareness issues and when we received a disaster declaration for a winter storm, discussions were held with IDOT on the possibility of living snow fences. The USACE also played an instrumental part in the coordination of the 2008 flooding events. They remain an active member of the Flood Risk Management Team. It should also be mentioned that since the 2007 plan, the State of Illinois uses the National Incident Management System (NIMS) to establish a framework for coordination. With NIMS and the National Response Plan, we address the complete spectrum of incident management and planning among Federal, State, Local Non-governmental

and private sector organizations. These relationships continue to grow through planning, response and recovery. The true effectiveness of these relationships during the planning process is continually seen during the response and recovery efforts following a disaster.

Mitigation Projects Currently In Progress

To be successful, mitigation must be a continual process that is continually striving to lessen the impact of natural hazards within the State. The following are projects that have been identified as viable projects and are currently in the application phase or are in the infancy of the project.

Illinois Emergency Management Agency and Federal Emergency Management Agency:

Projects in Progress:

- DuPage County has been approved in the amount of $754,417 in Federal funds to be used toward the purchase of (3) homes. A grant agreement between the State and County is in place. The County is currently making offers on the homes.

- Lake County Storm Water Management Commission was awarded a grant by the Illinois Department of Commerce and Economic Opportunity to purchase the Gurnee Grade School. The school has been purchased and demolition cost estimated at approximately $500,000 will be awarded from the Hazard Mitigation Grant Program. The benefit/cost for this project was 3.57.

- Winnebago County has been awarded funding for two acquisition projects; one on Blackhawk Island and the other on Edgemere Terrace. Funding for the Blackhawk Island project has been obligated in the amount of $1,305,000 in Federal funds to be used toward the estimated total cost of $1,740,000 to purchase 41 homes and 19 vacant lots. The non-Federal share is $435,000. The benefit/cost is 1.685. The County is also requesting $1,604,192 in Federal funds to be used toward the estimated total cost of $2,138,923 to purchase thirteen homes on Edgemere Terrace. The non-Federal share is $534,731. The benefit cost for this project is 2.175.

- DeKalb County is requesting $4,238,406 in Federal funds to be used toward the estimated total cost of $5,651,208. This is for the Evergreen Park Mobile Home Park which contains 131 structures. The benefit/cost ratio is 1.03.

- The Village of Addison has been approved for $2,467,869 in Federal funds to be used toward the estimated total cost of $3,290,479. There are 14 structures and the benefit/cost is 1.44.

- Rock Island County has been approved for $1,036,334 in Federal funds to be used toward the estimated total cost of $ 1,381,779. This is for the River Oaks Mobile Home Park which contains 34 structures.

- Alexander County has been approved for $8,747,951 in Federal funds to be used toward the estimated total cost of $11,663,935. Alexander County is seeking the non-Federal share of $2,915,985 from the Illinois Department of Natural Resources / Office of Water Resources (IDNR/OWR). The application requests funds to acquire 142 structures and elevate six structures. The benefit/cost is 5.15.

- Jackson County has been approved for $2,189,130 in Federal funds to be used toward the estimated total cost of $2,918,840. The non-Federal share of $729,710 is being sought from the IDNR/OWR. The application requests funds to purchase the Reed Station Mobile Home Park, the 48 trailers located there, and an adjacent property. All of the structures in the Mobile Home Park were substantially damaged, but a benefit/cost will be calculated for the adjacent property.

II. ILLINOIS NATURAL HAZARD MITIGATION PLAN PROCESS

The Illinois Natural Hazard Mitigation Plan (INHMP) was prepared by the Illinois Emergency Management Agency (IEMA), Bureau of Disaster Assistance and Preparedness (DA&P). The State Hazard Mitigation Officer (SHMO) is responsible for leading and coordinating mitigation and long-term redevelopment efforts. The State Hazard Mitigation Officer organized the Illinois Natural Hazard Mitigation Planning Committee (INHMPC), originally composed of seventeen representatives from federal, State and local governments, the private sector and a non-profit organization, to assist the DA&P bureau in preparing the Plan. Members of this original committee were also members of the larger IMAG group. The original INHMPC was instrumental in the development of the Illinois Natural Hazard Mitigation Plans. Three additional state agencies were introduced to the 2013 update planning process, in an effort to provide additional guidance and input into the INHMP. Representatives from the twenty state and federal agencies provide IEMA with advice and technical guidance regarding portions of the INHMP. The consultation of these supporting agencies ensures that there are no conflicting or duplicated mitigation efforts, assists in the identification of the State's vulnerabilities to hazards and provides input regarding the development of goals and items to mitigate the hazards. For the plan update it proved more difficult to get the group together to attend meetings. The State has downsized the number of employees and choices have to be made for the most effectively use of State employees time. We had a strong framework with the approved plan so we limited the number of meetings to three. We intently worked with the representatives of the agencies by means of frequent phone calls and emails. Ideas and required updates have been noted since the original plan was completed and incorporated in the plan update.

A meeting was held on November 15th, 2012 at the Illinois Emergency Management Agency to discuss the plan update process and new regulations and/or guidance documents in place since the last update. The meeting was attended by the supporting state and federal agencies of the INHMPC. All sections of the 2010 plan were discussed during this meeting. The SHMO evaluated the comments that had been made. The SHMO also brought new ideas for mitigation projects to the committee and asked them to consider how mitigation might be incorporated into their respected agencies/departments. Each agency representative was given a list of their mitigation

strategies prior to the meeting and was asked to provide any updates they saw necessary. Everyone complied, and while most of their actions remain in tact, contacts info was updated and so were funding sources, timelines, and program names. The meeting was open to all of the planning committee for comments and suggestions for necessary updates. FEMA was invited to call in or attend the meeting, but were unable to do so.

In additional to large planning meetings, IEMA mitigation staff conducted individual meetings with each state agency representative to review the plan's mitigation goals and strategies in an effort to streamline the hazard mitigation plan update process. During the meeting, we discussed the agency's specific mitigation ideas and concepts regarding the State's mitigation goals and strategies as outline in the Hazard Mitigation Plan. The meeting was also utilized to review and update in more detail the agency Capability Assessment forms. With increasing time constraints this approach provided an opportunity to discuss in detail mitigation with all participating agencies and ultimately provide a better finished product. The meeting provided the opportunity for each agency to speak with our mitigation staff in detail and discuss potential projects, areas where their agency could assist with mitigation efforts and mitigation hindrances they have experienced. After individual meetings were completed, the mitigation strategy section was sent to all planning members with all of the changes highlighted for their review.

Following the individual meetings; updates were completed to the Mitigation Strategy Section of the plan and forwarded to all planning members for review. The planning committed convened as an entire group on April 16th, 2013 to review as a whole the mitigation goals/strategies that were developed and updated during these individual meetings.

A final planning meeting was conducted on August 29th, 2013 to review all of the changes regarding the 2013 update. The planning committee members were provided copies of the updated plan with all revisions being indicated in red text for easy review, approximately three weeks prior to the final meeting. This time period allowed committee members to review the plan and document any last revisions or comments for the final planning meeting.

The majority of changes were minor. The more extensive changes are identified, as follows.

- The 2013 INHMP has incorporated a level 1.5 HAZUS-MH analysis completed by Southern Illinois University focused on defining the potential flood exposure throughout the 102 counties in Illinois, including State essential facilities. The analysis generated a flood vulnerability report for each 102 Illinois counties, with a statewide summary report highlighting the major results of the flood-exposure assessment and identifying and quantitatively ranking the 15 most flood-vulnerable communities in Illinois, a list of critical facilities within the 100 year floodplain, and a HAZUS based flood exposure estimate for flood-prone state critical facilities.
- The National Weather Service, Illinois State Water Survey, Illinois Emergency Management Agency and the Office of the State Climatologist reviewed the hazard description and historical data portion of Chapter III in the State plan. Most of the descriptions and data for the different hazards were updated in the 2010 and new information was added at that time. No major research findings were added to this area of the plan.
- Since the actions items are very important to the plan, the planning committee reviewed all of the goals, objectives and action items, as appropriate providing comments. The individual agency meetings allowed for in depth discussion and analysis of new, revised or updated action items. This section of the plan was updated heavily to reflect the changes and cooperative efforts in the States mitigation efforts.
- The Local Capability Assessment section in Chapter IV was updated to include the recent success we have had with local mitigation plan coverage. The capability has grown and will continue to do so as more plans are approved. The data collected from these local mitigation plans was incorporated into the update of the INHMP.
- During the planning process it was determined that a pandemic was a viable natural hazard that should be added to the “Other Hazards” section of the INHMP. The Illinois Department of Public Health completed a detailed documentation regarding the hazard description and historical data for the portion of Chapter III. It was also determined that all hazard identified in the “Other Hazards” section should be continually review in order to determine if there impact and historic occurrence increase and would warrant that hazard to be identified as a primary hazard.

Since the original plan was developed, it has been posted on the IEMA website and comments were invited. For the last 10 months, the following message was featured on the IEMA Mitigation home page: "*The Illinois Emergency Management Agency is currently updating the Illinois Natural Hazard Mitigation Plan. This is the State's plan to reduce the harm natural disasters cause individuals and property. Comments and input on the plan from the general public are always welcome, especially during updates, and can be submitted to the State Hazard Mitigation Officer at Ron.Davis@illinois.gov*. "This is a public website and all levels of government and the public are able to review the plan and provide comments. The current 2010 plan will subsequently be replaced by the 2013 plan upon it's official FEMA approval. Posting the State's Natural Hazard Mitigation Plan online enables our viewers to have direct access and provides the greatest access for public comment and input.

In addition, the newly updated Mitigation Strategy Section was posted on the IEMA website from April 18th, 2013 to June 1st, 2013 for public review, with public comments invited. This public involvement and feedback is important to the State's mitigation goals, objectives, strategies and actions.

During this planning process the supporting state and federal agencies coordinated the update of the Plan, recognized and incorporated other sources of expertise and resources and established a mitigation strategy to protect the citizens of Illinois including life, property, environment and economic interests. Each participating agency was able to introduce its programs, name, classify and pinpoint mitigation opportunities and subsequently comment on the changes in the Plan. Supporting agencies supplied agency capability assessment forms, provided technical guidance to specific portions of the plan and supplied detailed examples of individual agency specific mitigation actions they are currently supporting and/or conducting in Illinois.

Appropriate comments were incorporated into the final version of the Plan and the final version will be distributed to the participating agencies.

A. ILLINOIS NATURAL HAZARD MITIGATION PLAN COMMITTEE

American Red Cross	To provide insight into mitigation activities as they relate to response and recovery.
Federal Emergency Management Agency	To provide guidance on the planning process.
Capitol Development Board	To provide information on the status of building codes in Illinois.
Central Management Services	To provide data on State facilities and mitigation measures used at State facilities.
Illinois Department of Commerce and Economic Opportunity	To identify opportunities to promote economic development through mitigation initiatives. To be a liaison between local economic development agencies and the Illinois Natural Hazard Mitigation Planning Committee. To provide census data.
Illinois Department of Insurance	To provide insight into how reducing damages relates to consumers and the insurance industry.
Illinois Department of Natural Resources	To study the rivers and waterways of the State and identify solutions, both structural and nonstructural, to mitigate flooding. To ensure compliance with the NFIP regulations.
Illinois Department of Public Health	To provide information on preventing and controlling disease and injury which intersects with IEMA's mission.
Illinois Department of Transportation	To help local communities identify mitigation measures for State roads. To identify state resources and infrastructure vulnerable to hazards.

Illinois Emergency Management Agency	To coordinate mitigation planning and project implementation. To serve as a liaison between FEMA's Federal Insurance and Mitigation Administration and the Illinois Natural Hazard Mitigation Planning Committee. To educate local governments (specifically local planning departments) on new hazard mitigation planning requirements and to aid the incorporation of mitigation concerns into local comprehensive planning efforts.
Illinois Emergency Services Managers Association	To be a liaison between the Illinois Natural Hazard Mitigation Planning Committee and the local governments about hazard mitigation planning requirements. To educate local officials about the resources available for mitigation planning assistance and training.
Illinois State Board of Education	To provide information on mitigation activities in the State's public schools including disaster resistant construction and disaster drills.
Illinois State Geological Survey	To provide information on the soil and geology of Illinois and it's relation to natural hazards.
Illinois Historic Preservation Agency	To help communities identify ways to mitigate hazards that threaten historic resources in their communities. To assist communities in Section 106 review processes for mitigation projects in compliance with federal and state historic preservation regulations.
Illinois State Water Survey	To provide data on the State's climate as it relates to natural hazards (State Climatologist).

Illinois Department of Corrections	To identify ways to mitigation hazards that threatens correctional institutions within the State.
National Weather Service	To provide information on weather as it relates to natural disasters.
Illinois Commerce Commission	To provide insight on how to mitigate hazards that threatens public utilities and infrastructure within the State.
Illinois Department of Human Services	To provide data on state hospitals and human service facilities and mitigation measures used at these facilities.
Illinois Environmental Protection Agency	To provide information and data regarding environmental applications with mitigation measures.

The Illinois Natural Hazard Mitigation Planning Committee (INHMPC) members were drawn from the Interagency Mitigation Advisory Group (IMAG). The IMAG concept brings together those agencies that can and do contribute staff, expertise and funding to mitigation efforts in Illinois. IMAG is composed of members from, but not limited to, agencies involved in emergency management, natural resources, environmental regulations, historic preservation, planning and zoning, community development, construction regulation, public information and insurance, Federal, State and local levels of government, private non-profit organizations and academic fields who have expertise in mitigation and who can offer technical assistance. This group meets annually and has the following responsibilities:

1) Serves in an advisory role, providing expertise and technical assistance, in regards to policy creation consistent with the State's mitigation goals.
2) Developing a comprehensive strategy for the development, integration and implementation of the State's mitigation programs.

The Mitigation Coordination and Strategy Committee (MCSC), which is a sub-committee of IMAG, will meet monthly. This group is comprised of staff from IEMA, IDNR, IDOT, IHPA, DCEO, CMS, FEMA, and ARC. This group is part of IMAG and serves as the MCSC as well as on the INHMPC.

The MCSC has the following responsibilities:

1) Reviewing and provide suggestions regarding possibly re-prioritizing mitigation actions/applications for implementation, including measures to be funded.
2) Combining funds from various programs to implement a mitigation project and monitor the funding, using all allocations to the extent possible.
3) Overseeing implementation of approved projects.
4) Reviewing plans and reports to identify opportunities to integrate mitigation actions.
5) Providing technical assistance to local jurisdictions.
6) Preparing periodic status reports, briefings and/or an annual report for the IEMA Director, Governor and Legislature.
7) Monitoring and determining, as needed, and no less than annually, if the Illinois Natural Hazard Mitigation Plan needs updating by working with and being a part of the INHMPC.

The Illinois Natural Hazard Mitigation Planning Committee (INHMPC) was instrumental in developing this plan and continues to function, as needed, and no less than annually, as follows:

1) Identifying the State's vulnerability to hazards.
2) Developing and updating the Illinois Natural Hazard Mitigation Plan required under 44 CFR Section 201.

The Plan is an annex to the State of Illinois Emergency Operations Plan and is integrated into the State's planning efforts as dictated by the Emergency Management Accreditation Program. The Plan is submitted to FEMA Region V and reviewed. FEMA uses the plan as a reference to understand the risks and potential mitigation activities in Illinois.

2013 UPDATES/CHANGES MADE TO THE 2010 INHMP

Each section was reviewed and the appropriate wording updates were made (i.e. new page numbers, acronyms revised, Division of Disaster Assistance and Preparedness to Bureau of Disaster Assistance and Preparedness, DFO to JFO, etc.). Specific changes are as follows:

I-Introduction

Section H.; Mitigation Success Stories in Illinois, was updated extensively to include projects that were funded since the approved 2010 INHMP, as well the projects we are looking at funding in the next 3 years. This section was divided into three categories. Mitigation Success Stories, which highlights a number of mitigation success stories within the past three year. Past Mitigation Success Stories, this provides a detailed update of how past mitigation projects continue to remain successful in mitigating the hazards in Illinois. Finally, the Current Mitigation Projects Currently Under Review or Progress, provides information regarding what projects are currently being completed in the State and also projects that have been identified potential future projects.

II-Plan Process

The updating process was described. New planning team members were identified for the American Red Cross, Central Management Services (CMS), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Department of Public Health (IDPH), Illinois Emergency Management Agency (IEMA) and the Illinois Emergency Services Managers Association (IESMA). The Illinois Department of Corrections (IDOC), Illinois Department of Human Services (IDHS), Illinois Environmental Protection Agency (IEPA) and Illinois Commerce Commission (ICC) were new agencies added to the planning team.

III-Hazard Analysis and Risk Assessment

The history of the Illinois natural hazards was updated covering the last three years for both Federal Declarations and those that were only State Proclamations. Additional research was done to discover those disasters that were declared prior to 1981 and obtain more comprehensive data regarding the vulnerability of these occurrences. The National Weather Service, Illinois State Water Survey, Illinois Emergency Management Agency and the Office of the State Climatologist

reviewed the hazard description and historical data portion of Chapter III in the State plan and utilized any new data since the 2010 plan to update the appropriate sections. FEMA database only covers post-1981 major disaster declarations, so Illinois Public and Individual Assistance records were reviewed to acquire additional information. In addition a level 1.5 HAZUS analysis was completed which, focused on defining the potential flood exposure throughout the 102 counties in Illinois, including State essential facilities. This analysis was utilized to assist in determining the impact and loss estimates for flooding within Illinois.

Public Health Pandemic was added as an Illinois Hazard under other disasters. During the planning process it was determined that a pandemic was a viable natural hazard that should be added to the "Other Hazards" section of the INHMP. The Illinois Department of Public Health completed a detailed documentation regarding the hazard description and historical data. It was also determined that all hazard identified in the "Other Hazards" section should be continually review in order to determine if there impact and historic occurrence increase and would warrant that hazard to be identified as a primary hazard.

The Risk Analysis was reviewed and updated as necessary, for all natural hazards. Due to a change in the National Climatic Data Center Storm Database, a reanalysis of all the data utilized in the INHMP Risk Assessment was completed and updated, as necessary, for all natural hazards. A variety of data sources were reviewed to obtain additional information regarding past occurrences in order to create the most comprehensive list possible. These data sources include: Illinois Emergency Management Agency (IEMA), Federal Emergency Management Agency (FEMA), Illinois State Water Survey (ISWS) , US Geological Atmospheric Administration (USGS), Illinois State Geological Survey (ISGS), Illinois Department of Natural Resources (IDNR), US Army Corps of Engineers, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) and the National Climatic Data Center (NCDC). All of this information has been entered into a spreadsheet database for ease of information analysis and for using GIS mapping capabilities to display and identify Illinois hazard areas. The database was broken down by individual hazard occurrence by county. This database will be continually updated by mitigation staff, in order to maintain an accurate and active collection of previous occurrences. This database will also be an available planning tool for local jurisdictions.

IV-Mitigation Strategy

All of this section was reevaluated. The actions items were extensively reviewed and updated, as necessary, by the planning team and the State Hazard Mitigation Officer (SHMO). The addition of a new capability that will have a significant impact on the State's ability to track projects has been initiated. This will not only have a major impact on this planning process in the future, but also the monitoring of success stories, and the identification of priority projects statewide.

The update planning process instituted individual meetings with the agencies involved in the planning process. This approached allowed for a more in-depth review and discussion of the plan and in particular the Mitigation Strategy Section. These focused meetings produced updates of two of the State's mitigation goals, introduction of one new mitigation objective, four new strategies and fifty new mitigation action items.

The current status report for mitigation planning state wide was updated utilizing the most current planning information up to April 1st, 2013. The success of the program in addition to the length of time it has been around also led to the IEMA staff to identify those jurisdictions that will have their mitigation plans expire in the next 5 years. A planning map showing the expiration of current local hazard mitigation plans was also added in order to show a true perspective of the State's planning status.

Each individual planning team member was consulted with to identify new point of contacts as well as any new strategies they would like to include, or update. All of the existing Illinois Capability Assessment forms were reviewed and updated. New planning team members represent: American Red Cross, Central Management Services (CMS), Illinois Department of Commerce and Economic Opportunity (DCEO), Illinois Department of Public Health (IDPH), Illinois Emergency Management Agency (IEMA) and the Illinois Emergency Services Managers Association (IESMA). The Illinois Department of Corrections (IDOC), Illinois Department of Human Services (IDHS), Illinois Environmental Protection Agency (IEPA) and Illinois Commerce Commission (ICC) were new agencies added to the planning team. Incorporating a greater number of State agencies assisted in building a broader foundation regarding the State Mitigation Strategy.

V-Coordination of Local Mitigation Planning

The 2007 INHMP added to this section the pages entitled "Illinois County DMA2k Plans." In 2010 this section was updated to reflect the Local Plan integration as well as the increasing amount of approved plans and mitigation planning interest statewide. Illinois continues to approve DMA2k compliant plans, and it remains a top priority to review and evaluate these plans to compare their hazard rating system to the State Hazard Rating System. Some have used the States Hazard Rating methodology where as others have used their own method. These systems have been evaluated and translated into the State Hazard Rating System for comparison. This was done by using the State's existing evaluation sheets and adding a line that addresses the counties interpretation based on their local data. This technique provides a glimpse of the accuracy with which both planning bodies' rate hazards.

A HAZUS-MH analysis for flooding was produced for the 2013 INHMP update, which generated individual county flood vulnerability reports for all 102 counties with in Illinois. These vulnerability reports were provided to each prospective county to assist with their mitigation planning efforts and have been added as an INHMP appendix.

The 2013 INHMP update also introduced new general loss estimation tables for Illinois counties for flooding, tornadoes, severe storms, severe winter storms and earthquakes. These loss estimate tables were developed utilizing a variety of data sources including the 2010 U.S. Census data for total population, total residential units and average residential home value and the National Climatic Data Center (NCDC) storm data for Illinois. These databases were supplemented with additional information found in loss and demographic information in supplied local hazard mitigation plans.

VI-Plan Maintenance Process

While the process to maintain the plan remain unchanged, contact information and dated document references have all been updated.

III. HAZARD ANALYSIS AND RISK ASSESSMENT

The Illinois Natural Hazard Mitigation Planning Committee performed a technical review and evaluated all of the natural hazards shown in the Federal Emergency Management Agency "State and Local Mitigation Planning how-to-guide." The committee decided to divide the potential natural hazards into three categories: those extremely unlikely to occur in Illinois, those with low probability and minimal impact, or natural hazards that have in the past and in all probability will continue to impact Illinois at various levels of severity and frequency. The following pages extensively discuss the hazards with an impact: severe storms and tornadoes, floods, severe winter storms, drought, extreme heat, and earthquakes. Natural hazards that are less likely to impact Illinois are discussed at the end of this section (see page 108, I. Other Natural Hazards).

The primary hazards to be reviewed include severe storms and tornadoes, floods, severe winter storms, drought, heat waves and earthquakes. Illinois has received twenty two Presidential declarations for floods since 1990. Declarations have also been issued in response to three ice storm events and seven tornadoes, three of which were a combined declaration for tornadoes and flooding, and eight for severe winter storms. A complete list of Federal disaster declarations dating back to 1967 is on the next four pages. Following the list is an Illinois map showing Presidential Declarations since 1967. In addition, there was considerable interest in earthquake preparedness because of the media attention given to an unscientific prediction of an earthquake on the New Madrid fault in December of 1990. The State's disaster history along with capability assessments and hazard identification surveys confirm that the greatest threats to the citizens of Illinois lie in the natural hazards listed above.

A. Illinois Federal Disaster Declaration History (1957 - 2013)

Year	Declaration Number	Type of Disaster	Location
1957	78	Flood	
1961	115	Floods and Tornadoes	
1965	194	Tornadoes, Severe Storms and Flooding	
1967	OEP 227-DR	Tornado	Cities of Belvidere and Oak Lawn in Northern, IL
1968	OEP 242-DR	Flood	Six West-Central Counties
1969	OEP 262-DR	Flood	Upper Mississippi River
1969	OEP 276-DR	Flood	Lower Mississippi River
1972	OEP 351-DR	Flood	Cook and DuPage Counties
1973	OEP 373-DR	Flood	Statewide
1974	FDAA 427-DR	Tornado	Decatur/Macon County
1974	FDAA 438-DR	Tornado and Flooding	Morris in Grundy County
1975	FDAA 478-DR	Tornado	Canton in Fulton County
1976	FDAA 509-DR	Tornado	Downers Grove and Lemont
1979	FDAA 583-DR	Flood	Illinois River, 29 Counties
1979	FDAA 3068-DR	Snow Emergency	Northern 3rd of Illinois
1981	FEMA 643-DR	Flood	Chicago suburbs of South Cook and Will Counties
1982	FEMA 660-DR	Tornado	Marion in Williamson Co. and Conant in Perry County.
1982	FEMA 674-DR	Tornado and Flooding	New Baden, IL
1983	FEMA 684-DR	Flood	Mississippi River
1985	FEMA 735-DR	Severe Storm, Flooding and Ice jams	Kankakee, Wabash, and Illinois Rivers
1986	FEMA 776-DR	Flood	McHenry, Northern Lake and Parts of Cook
1987	FEMA 798-DR	Flood	Des Plaines River
1989	FEMA 819-DR	Tornado	Allendale in Wabash County
1990	FEMA 860-DR	Ice Storm	Champaign/Urbana
1990	FEMA 871-DR	Tornado and Flooding	Findlay in Shelby Co. and Newton in Jasper Co. Statewide 28 Counties
1990	FEMA 878-DR	Tornado	Plainfield/Joliet, Will Co.
1992	FEMA 941-DR	Flood	Chicago freight tunnel flood
1993	FEMA 997-DR	Flood	Statewide 39 Counties, primarily Mississippi and Illinois River Valleys
1994	FEAM 1025-DR	Flood	Scattered-16 Counties, mostly Central Illinois
1995	FEMA 1053-DR	Flood	Scattered-19 Counties Metro-East area and IL River
1996	FEMA 1110-DR	Tornado	Scatterred-5 counties, mostly Central Illinois
1996	FEMA 1112-DR	Flood	Central and Southern Illinois
1996	FEMA 1129-DR	Flood	Northeastern IL- 15 Counties
1997	FEMA 1170-DR	Flood	Southern IL-Ohio River

Year	Declaration Number	Type of Disaster	Location
1997	FEMA 1188-DR	Flash Flood	Chicago (Cook Co.)
1999	FEMA 3134-EM	Snow	51 Counties (PA Only) North Central
1999	FEMA 1278-DR	Flood	Jo Daviess County (concurrent to 13 Iowa Counties)
2001	FEMA 3161-EM	Severe Winter Storm	Central and Northeastern - 27 Counties
2001	FEMA 1368-DR	Flood	Jo Daviess to Calhoun along Mississippi River-10 Counties
2002	FEMA 1416-DR	Severe Storm, Tornadoes and Flooding	Scattered-68 Counties Central and Southern IL
2003	FEMA 1469-DR	Tornadoes, Severe Storms and Flooding	Scattered 16 Counties Adams, Alexander, Brown, Fulton, Greene, Hancock, Mason, Massac, McDonough, Pike, Pope, Pulaski, Schuyler, Tazewell, Union and Woodford.
2004	FEMA 1513-DR	Tornadoes	Kankakee, LaSalle, Putnam and Will Counties
2005	FEMA 3199-EM	Snow	Southern IL- 17 Counties, Edwards, Franklin, Gallatin, Hamilton, Hardin, Jackson, Jasper, Johnson, Lawrence, Massac, Pope, Richland, Saline, Union, Wabash, White, and Williamson
2005	FEMA 3230-EM	Hurricane Katrina Evacuation	All 102 Counties
2006	FEMA 1633-DR	Super cell Thunderstorm and Tornados	Central Illinois – 6 Counties Green, Logan, Morgan, Randolph, Scott, and Sangamon Counties
2006	FEMA 3269-EM	Snow	Northern and West Central Illinois – 26 Counties Adams, Boone, Brown, Bureau, DeKalb, Fulton, Hancock, Henry, Kendall, Knox, LaSalle, Lee, Marshall, Mason, McDonough, McHenry, Menard, Ogle, Peoria, Pike, Putnam, Scott, Stark, Stephenson, Tazewell and Winnebago counties
2007	FEMA 1681-DR	Severe Winter Storm	Central and Mid-Southwestern Illinois – 18 Counties Bond, Calhoun, Christian, DeWitt, Fayette, Jersey, Logan, Macon, Macoupin, Madison, McLean, Monroe, Montgomery, Piatt, Sangamon, Shelby, St. Clair, and Woodford counties
2007	FEMA 1722-DR	Severe Storms and Flooding	Stephenson and Winnebago
2007	FEMA 1729-DR	Severe Storms and Flooding	Grundy, Lake, Will, Cook, Knox, Warren, DeKalb, Kane, and LaSalle Counties
2008	FEMA 1747-DR	Severe Storms and Flooding	Livingston and Iroquois

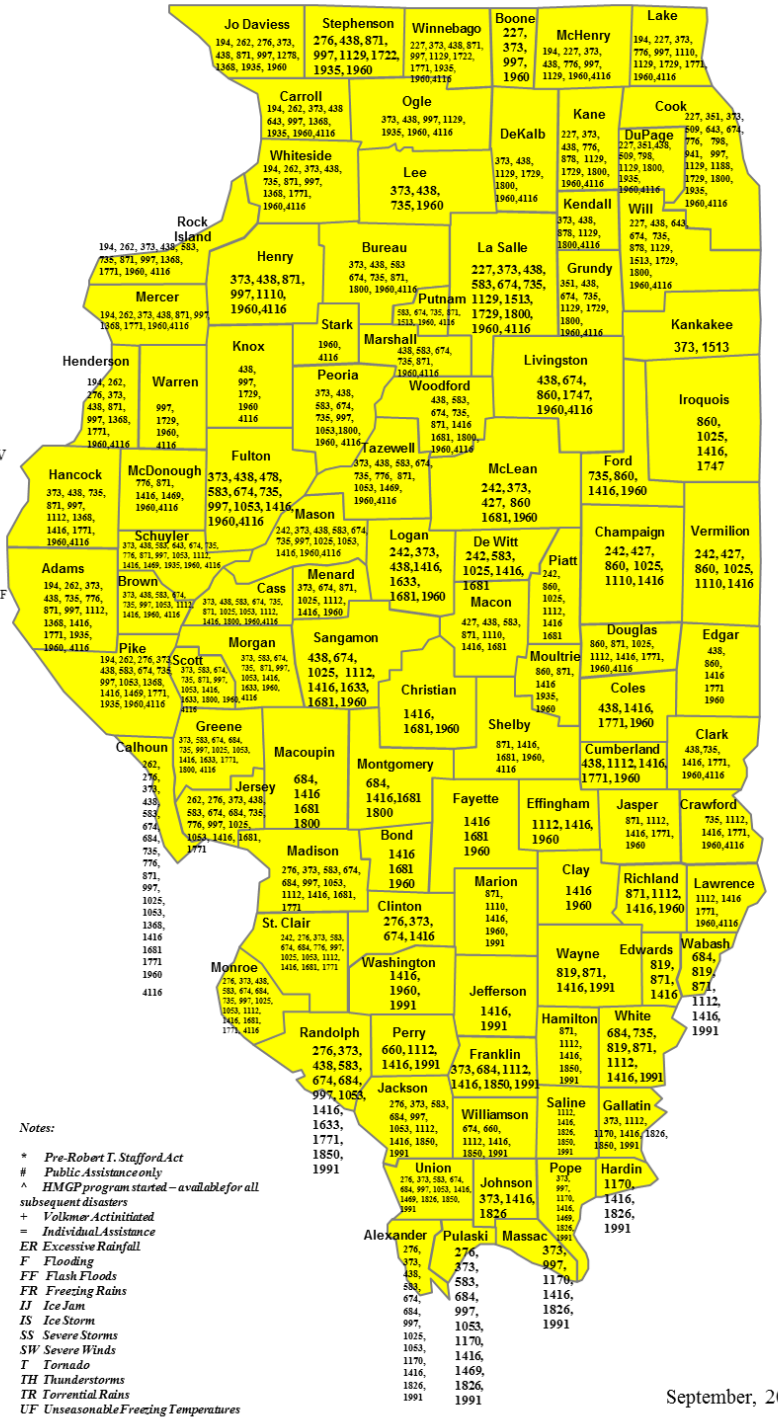
Year	Declaration Number	Type of Disaster	Location
2008	FEMA 1771-DR	Severe Storms and Flooding	Adams, Calhoun, Clark, Coles, Crawford, Cumberland, Douglas, Edgar, Greene, Hancock, Henderson, Jasper, Jersey, Lake, Lawrence, Madison, Mercer, Monroe, Pike, Randolph, Rock Island, St. Clair, and Winnebago counties
2008	FEMA 1800-DR	Severe Storms and Flooding	Bureau, Cass, Cook, DeKalb, DuPage, Greene, Grundy, Kane, Kendall, LaSalle, Macoupin, Montgomery, Peoria, Scott, Will, and Woodford Counties
2009	FEMA 1826-DR	Severe Winter Storm	Alexander, Gallatin, Hardin, Johnson, Massac, Pope, Pulaski, Saline, and Union Counties
2009	FEMA 1850-DR	Severe Storms (Derecho), and Flooding	Franklin, Gallatin, Jackson, Randolph, Saline, and Williamson
2010	FEMA 1935-DR	Severe Storms and Flooding	Adams, Carroll, Cook, DuPage, Jo Daviess, Moultrie, Ogle, Pike, Schuyler, Stephenson, and Winnebago
2011	FEMA 1960-DR	Severe Winter Storm and Snowstorm	Adams, Bond, Boone, Brown, Bureau, Calhoun, Carroll, Cass, Christian, Clark, Clay, Coles, Cook, Crawford, Cumberland, DeKalb, Douglas, DuPage, Edgar, Effingham, Fayette, Ford, Fulton, Grundy, Hancock, Henderson, Henry, Jasper, Jo Daviess, Kane, Knox, La Salle, Lake, Lee, Livingston, Logan, Marion, Marshall, Mason, McDonough, McHenry, McLean, Menard, Mercer, Morgan, Moultrie, Ogle, Peoria, Pike, Putnam, Richland, Rock Island, Sangamon, Schuyler, Scott, Shelby, Stark, Stephenson, Tazewell, Warren, Washington, Whiteside, Will, Winnebago, and Woodford County
2011	FEMA 1991-DR	Severe Storms and Flooding	Alexander, Franklin, Gallatin, Hamilton, Hardin, Jackson, Jefferson, Lawrence, Marion, Massac, Perry, Pope, Pulaski, Randolph, Saline, Union, Wabash, Washington, Wayne, White, and Williamson County
2013	FEMA 4116-DR	Severe Storms, Straight-line Winds and Flooding	Adams, Brown, Bureau, Calhoun, Carroll, Cass, Clark, Cook, Crawford, DeKalb, Douglas, DuPage, Fulton, Greene, Grundy, Hancock, Henderson, Henry, Kane, Kendall, Knox, La Salle, Lake, Lawrence, Livingston, Marshall, Mason, McDonough, McHenry, Mercer, Monroe, Morgan, Ogle, Peoria, Pike, Putnam, Rock Island, Schuyler, Scott, Shelby, Stark, Tazewell, Warren, Whiteside, Will, Winnebago, and Woodford County

ILLINOIS

MAP SHOWING MAJOR DISASTER DECLARATIONS SINCE 1965

102 counties declared

DR#	Declaration	Event
78*	6/22/57	Not Available
115*	5/27/61	Not Available
194*	4/25/65	SS, F, T
227*	4/25/67	T
242*	6/15/68	SS, F, T
262*	6/6/69	F
276*	8/30/69	F
351*	9/4/72	SS, F
373*	4/26/73	SS, F
427*	4/11/74	T
438*	6/10/74	SS, F
478*	7/25/75	T
509*	6/18/76	SS, F, T
583*	4/30/79	SS, F
643*	6/30/81	SS, F, T
660*	5/31/82	T (Marion, Conant)
674*	12/13/82	T (New Baden), SS, TR, F, SW
684*#	6/6/83	T, TH, FF, UF
735*	3/29/85	SS, ER, IJ, F
776*	10/7/86	TR, FF
798*	8/21/87	TR, FF
819*^	1/13/89	T (Allendale)
860	3/6/90	IS, FR, SW
871	6/22/90	TH, SW, T (Findley, Newton), TR, F
878	8/29/90	T
941#	4/15/92	Chicago Tunnel Flood
997+	7/9/93	Great Midwest Flood
1025	4/26/94	TR, TH, FF
1053	5/30/95	T, TH, SS, SW, TR, FF
1110	4/23/96	T, SS
1112	5/6/96	SS, TR, SW
1129	7/25/96	SS, SW, TR, FF
1170	3/21/97	SS, TR, FF
1188=	9/17/97	Chicago Basement Flood
1278	5/28/99	TR, FF
1368	5/9/01	F
1416	5/21/02	SS, T, F, ER
1469=	5/3/03	SS, T, F
1513	4/23/04	SS, T
1633	4/13/06	SS, T
1681	2/9/07	SS (winter)
1722=	8/30/07	SS, F
1729#=	9/25/07	SS, F
1747=	3/7/2008	SS, F
1771	6/24/08	SS, F
1800	10/3/08	SS, F
1826#	3/2/09	SWS
1850#	7/2/09	SS, F
1935	8/19/10	SS, F
1960#	3/17/2011	SWS, Snowstorm
1991	6/7/2011	SS, F
4116	5/10//13	SS, F, SW



Notes:

* *Pre-Robert T. Stafford Act*
\# *Public Assistance only*
^ *HMGP program started – available for all subsequent disasters*
\+ *Volkmer Act initiated*
= *Individual Assistance*
ER Excessive Rainfall
F Flooding
FF Flash Floods
FR Freezing Rains
IJ Ice Jam
IS Ice Storm
SS Severe Storms
SW Severe Winds
T Tornado
TH Thunderstorms
TR Torrential Rains
UF Unseasonable Freezing Temperatures

September, 2012

The Illinois Natural Hazard Mitigation Planning Committee has developed a methodology for rating natural hazards in Illinois. This process is explained on the next page with the charts beginning on page 12 and maps using this methodology have been prepared and inserted into this document for each natural hazard. The maps that are in this document by hazard were prepared using a table that is in the supporting documentation file.

This system for rating natural hazards in Illinois is not only being used here, but is going to be posted on the IEMA Mitigation website for the local jurisdictions to use in their planning process. All local jurisdictions will be encouraged to adopt this process in their mitigation planning activities. The adoption of a standard system will lend itself to the blending of information. As local mitigation plans are received, their risk assessments will be reviewed by the State Hazard Mitigation Officer and incorporated into the State Hazard Mitigation Plan.

B. Illinois Hazard Rating Process

The overall objective of this process is to devise a method to compare and evaluate natural hazards in Illinois. In order to accomplish this task, a period of time was selected, data was collected on the natural hazards and categories for evaluation were identified. These categories were sub-divided into three divisions and scores for each division were given. The exact procedure is discussed in the next several pages and this section is concluded with a table revealing the results of this process. This Hazard Rating Process was reviewed and updated by Supporting State Agency Hazard Mitigation Planning Members in an effort to ensure that the identified rating process continued to produce an accurate depiction of the hazards associated with the State of Illinois. Three of the four hazard rating categories remained unchanged as their relevance remained consistent. The HISTORIC/PROBABILITY (frequency) was subsequently updated to more effectively reflect the increased amount of historic data available.

There are four categories (Historical/Probability, Vulnerability, Severity of Impact and Population) that will identify and define the ratings of each hazard, noted in the five tables on the next three pages. The first table will identify what has occurred in the past as a guide to projecting the probability for future occurrences. The second table will identify the number of citizens who might be impacted based on individual criteria identified in the methodology. The third table will estimate the severity by considering health and safety, continuity of operations, property, facilities, infrastructure, environment, economic and financial situation. The fourth category is population with two tables: table 4A is based on the 2010 census population and table 4B is based on the projected population growth for the next ten years.

The first three tables are weighted three times as much as the last two tables combined. Each hazard (for example flood) will have a score from each of the five tables. These tables are displayed and the score to be used is identified on the following pages by table. This last column under each hazard will be the total overall score of the five tables. This overall score will be evaluated, as shown below:

Low – 0 to 12 (green)
Guarded – 13 to 24 (blue)
Elevated – 25 to 36 (yellow)
High – 37 to 48 (orange)
Severe – 49 to 60 (red)

For example, under flood there will be a number from each of the five tables. These five numbers will be totaled to arrive at the overall risk for floods. This rating process is being done by county for all major natural hazards in Illinois. These numbers will be transferred onto a separate spreadsheet by county and colored coded as indicated above to readily indicate the hazard ratings.

1) HISTORICAL/PROBABILITY (frequency)

-The number of times that a disaster has occurred in a jurisdiction in the past 60 years
-The information is being used to determine and evaluate the likelihood for future disasters

Low (6)	0 to 12 occurrences in the last 60 years
Medium (12)	13 to 60 occurrences in the last 60 years
High (18)	More than 60 occurrences in the last 60 years

2) VULNERABILITY (percentage of people)

-The relationship of where people live in or near the hazard area
-The percentage of people that will be adversely affected should the hazard occur

Low (6)	Less than 10% of the total population of the jurisdiction
Medium (12)	10% to 25% of the total population of the jurisdiction
High (18)	More than 25% of the total population of the jurisdiction

3) SEVERITY OF IMPACT (injuries, fatalities, personal property & infrastructure)

-The worst conceivable impact to human life and property which could result from a hazard
-The essential facilities are defined for this purpose as PUBLIC SAFETY (fire, police & local government) and UTILITIES (electric, gas, telephone water & sewer)

Low (6)	Minor injuries (under 50) & property damage (under $1,000,000), or less than 24 hour shutdown of essential facilities
Medium (12)	Serious injury (more than 50), major property damage (structural stability) ($1,000,001 to $15,000,000), or 24 to 72 hour shutdown of essential facilities
High (18)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than $15,000,000), or more than 3 days of shutdown for essential facilities

POPULATION–COMBINED FOURTH CRITERIA based on 1/3 the value of the above tables. The committee was instructed to include growth as a factor for the risk assessment. After a review of the data the committee concluded that giving the future growth equal weight with the other factors skewed the risk assessment. Counties range in population from approximately 5,000 to 5,000,000. To say a population growth of 25% in a smaller county (1, 250) would have more of an impact than a larger county with 10% growth (500,000) was not acceptable to the committee.

The committee also determined that because of the large population disparity between counties the Vulnerability and Severity of Impact didn't fully distinguish the quantity of people that could be exposed to risk. The committee decided to give the population of the counties equal weight with the growth factor. The planning committee discussed the impact of population on the risk assessment at length. While population is acknowledged to be an important factor to be considered, it is of lesser significance than the first three criteria and has been assigned 1/3 the value. On a scale of 100 the first three tables would receive 30 each and the remaining 10 was allocated to population.

4A) POPULATION (number in jurisdiction)

-The actual 2010 population census figure per jurisdiction
-The quantity will be used to identify a slight increase in risk

Low (1)	0 to 100,000 population in the jurisdiction
Medium (2)	100,001 to 500,000 population in the jurisdiction
High (3)	More than 500,000 population in the jurisdiction

4B) POPULATION GROWTH (percentage of increase)

-The projected population growth in a jurisdiction over the next 10 years
-The population growth estimates will be used to identify a potential increase to risk

Low (1)	% of decrease to 10% projected population increase in the jurisdiction
Medium (2)	11% to 25% projected population increase in the jurisdiction
High (3)	More than 25% projected population increase in the jurisdiction

HAZARD WORKSHEET METHODOLOGY

Sixty two years of Illinois hazard data (1950-2012) was obtained from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States (SHELDUS) for severe storms (thunderstorms, high wind, lightning and hail) and tornadoes, floods, severe winter storms, drought, and extreme heat. The Illinois State Geological Survey was able to supply an equivalent time frame of data for earthquake activity in Illinois. The INHMP Risk Assessment examines natural disasters on a statewide basis and as well as individual counties. Natural hazards include those caused by climatological, geological, hydrologic, or seismic events. A variety of data sources were reviewed to obtain additional information regarding past occurrences in order to create the most comprehensive list possible. These data sources include: Illinois Emergency Management Agency (IEMA), Federal Emergency Management Agency (FEMA), Illinois State Water Survey (ISWS), US Geological Atmospheric Administration (USGS), Illinois State Geological Survey (ISGS), Illinois Department of Natural Resources (IDNR), US Army Corps of Engineers, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) and the National Climatic Data Center (NCDC). All of this information has been entered into a spreadsheet database for ease of information analysis and for using GIS mapping capabilities to display and identify Illinois hazard areas. The database was broken down by individual hazard occurrence by county. This database will be continually updated by mitigation staff, in order to maintain an accurate and active collection of previous occurrences. This database will also be an available planning tool for local jurisdictions.
Historical/probability– An average of the number of events that have occurred since 1950.

Vulnerability– Severe Storm–All counties are susceptible to severe storms. At any one time, it has been determined that over 25% of the county population might experience severe storms. This determination is supported by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, as follows: "Damage from severe thunderstorms is usually on a much broader spatial scale in the state of Illinois. . Illinois averages more than 500 reports of wind damage and nearly 375 reports of large hail annually. Approximately 80% of the severe thunderstorms are multicellular or a supercell hybrid, which are capable of producing damaging wind and/or large hail over approximately a 400 to 500 square mile area. The remainder of severe thunderstorms are squall lines, which can produce damage over 100% of the affected counties. Thus, the vulnerability to severe thunderstorms should be high (greater than 25% of the population affected) in each county across Illinois. This is reinforced by a study done by Stanley Chagnon of Chagnon Climatologist, in

his publication *"Thunderstorms Across the Nation - An Atlas of Storms, Hail, and Their Damages in the 20th Century"*. This study indicated that in an analysis of thunderstorm caused catastrophes, Illinois ranked 4th in the United States in total thunderstorm catastrophes between 1949 and 1998."

Tornado–While all of Illinois is susceptible to tornadoes (in fact north, south, east and west counties have all been hit by tornadoes) it is estimated less than 10% of a county would be impacted by a tornado at any one time. This estimation is supported by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, as follows: "Based on data of tornadoes in the state of Illinois for the 57 year period from 1950 – 2011, nearly 77%were rated as weak tornadoes (EF0/EF1), 22%were rated as strong tornadoes (EF2/EF3), and 1%were rated as violent tornadoes (EF4/EF5) on the Enhanced Fujita damage assessment scale. The data also suggests that weak tornadoes are typically 60 yards wide with a path length of 2 miles, strong tornadoes are usually 200 yards wide with a path length around 10 miles, with violent tornadoes around 1/4 mile wide and path lengths greater than 20 miles. This would mean that with nearly 2205 tornadoes reported, approximately 825 square miles of Illinois have been affected by tornadoes." "Considering that Illinois is nearly 56,000 square miles in size, with the average county around 545 square miles, the average population affected has been about 1.5%. Thus, every county in Illinois should have a "Low" vulnerability to tornadoes, (low being defined as less than 10% of the total population)."

Flood–History supports the assumption that all counties in Illinois are susceptible to some type of flooding. As stated above in the tornado analysis, it is estimated that 10% of a county would be impacted by flooding at any one time. Illinois Department of Natural Resources provided information on the 100 Year Floodzone in Unincorporated Areas ranging from 52.1% to 2.7% of the county being in the 100 year floodzone with the average being 13.5%. In general, incorporated areas would have a lower average floodzone, therefore, 10% was used for the overall county average.

Drought–In general, farmers are the first group to feel the impact of a drought. Besides causing stress to crops and livestock, many farmers rely on their own dug wells or wells drilled into shallow aquifers for their water supply. Both types of wells are very vulnerable to drought conditions. Public water supplies are typically more robust against drought but are not immune from long-term drought conditions. Public water supplies that rely on surface water supplies are historically more vulnerable to drought than those that rely on deep aquifers. The Illinois State Water Survey has produced a document dealing with drought and drought planning. The reference is *The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-supply Planning (*Illinois State Water Survey, 2006, ISWS IEM 2006-02).

Extreme Heat-The most at risk population is the sickly and the elderly. We have arbitrarily identified the elderly population by county and used this as the basis. As stated earlier the young people in poor health are also at risk. The assumption is made that the young people in poor health will be offset by the healthy elderly.

Severe Winter Storm–One hundred percent of the population is at risk from a severe winter storm in the State of Illinois.

Earthquake–The Applied Technology Council (ATC) has prepared a publication on rapid visual screening of seismically hazardous buildings. The National Earthquake Hazards Reduction Program Map (FEMA 154, Second Edition, 2002) for Illinois from this publication was used.

Severity of Impact–The various detailed parameters are identified in this table. When evaluating each county based on the 60+ year history, if there is any conflicting data the highest level will be assumed. In keeping with this philosophy and since the worst known earthquake (1811-1812) occurred outside of the 60+ year period of time, the decision was made to overlay the ATC map with the Modified Mercalli Scale Map (Modified Mercalli Intensities based on a 7.6 Magnitude Earthquake along the New Madrid Seismic Fault) to evaluate Illinois counties.

Population–The Illinois Department of Commerce and Economic Opportunity provided the 2010 census population and the projected population growth by county through 2015. This information was used in supplying information for the fourth and fifth tables. Using the tables in this rating process, the information has been extracted and analyzed in the following manner:

The following pages are the Illinois Hazard Rating by County. These hazard ratings were obtained utilizing the methodology established by the Illinois Natural Hazard Mitigation Planning Committee. Local hazard mitigation plan hazard ratings have been evaluated and translated into the State Hazard Rating System for comparison. This correlation was completed in an effort to improve the level of detail and comprehensiveness of statewide risk assessments and coordination of State hazard mitigation goals and objects with local goals and objectives. This correlation can be viewed in detail on page 30 in Section V of the INHMP. Hazard ratings were utilized from Counties with approved LHMPs and were compared to the hazard rating calculated by the State. The correlation of these two hazard ratings was utilized to determine the final State Hazard ranking for each county. During the correlation process, if it was determined that there was a discrepancy of greater than one rating level between the State and Local plan, the overall State Hazard Rating was adjusted accordingly to more accurately reflect the hazard for the county. For example, the State ranked Tornado as elevated for Coles County, whereas the Coles County Hazard Mitigation Plan ranked Tornado as Severe. This correlation proved to be greater than one rating. In order to effectively integrate the two plans ratings, the State Hazard Rating regarding tornados for Coles County was adjusted to a ranking of High. All State Hazard Rating that were adjusted utilizing this methodology are noted with an (*) in the upper right corner of the individual rating. Thirty-six of the seven hundred and fourteen hazard ratings were adjusted utilizing this methodology, equating to approximately .05% of all the hazard ratings.

Illinois Hazard Rating By County Based on Criteria and Methodology Established by the Illinois Natural Hazard Mitigation Planning Committee

Ratings Updated 7/1/2013
(*) Indicated Rating has been adjusted utilizing LHMP

Key	Low=0-12
Guarded=13-24	Elevated=25-36
High=37-48	Severe=49-60

County Name	Population	Severe Storms	Floods	Severe Winter Storms	Drought	Extreme Heat	Earthquake	Tornado
Adams	67,103	High	High	High	Guarded	High	Guarded	Elevated
Alexander	8,238	Severe	High	High	High	Guarded	Severe	Elevated
Bond	17,768	High	Elevated	High	Guarded	High	Elevated	High
Boone	54,165	High	Elevated	High	Guarded	Elevated	Guarded	Elevated
Brown	6,937	High	Guarded	High	Guarded	High	Guarded	Elevated
Bureau	34,978	Severe	Elevated	High	Elevated*	Elevated	Guarded	Elevated
Calhoun	5,089	High	Elevated	High	Guarded	High	Elevated	Guarded
Carroll	15,387	Severe	Elevated	High	High	Elevated	Guarded	Elevated
Cass	13,642	Severe	Elevated	High	Elevated	Elevated	Elevated	High*
Champaign	201,081	Severe	Elevated	High	Elevated	Elevated	Elevated	High
Christian	34,800	High	Elevated	High	Elevated	Elevated	Elevated	Elevated
Clark	16,335	High	Elevated	High	Elevated	Elevated	Elevated	Elevated*
Clay	13,815	Severe	Elevated	High	Elevated	Elevated	High	Elevated
Clinton	37,762	High	Elevated	High	Guarded	High	Elevated	High
Coles	53,873	Severe	Elevated	Severe	Elevated	Elevated	Elevated	High
Cook	5,194,675	Severe	High	Severe	Guarded	High	Guarded	High
Crawford	19,817	Severe	High*	High	Elevated	Elevated	Elevated	High*
Cumberland	11,048	High	Elevated	Severe	Elevated	Elevated	Elevated	Guarded
DeKalb	105,160	High	Elevated	High	Guarded	Elevated	Guarded	Elevated
De Witt	16,561	Severe	High	High	Elevated	Elevated	Elevated	Elevated
Douglas	19,980	Severe	Elevated	High	Elevated	Elevated	Elevated	Elevated
DuPage	916,924	Severe	High	High	Guarded	Elevated	Guarded	Elevated
Edgar	18,576	Severe	Elevated	High	Elevated	Elevated	Elevated	High*
Edwards	6,721	Severe	Elevated	High	Elevated*	Elevated	High	Elevated
Effingham	34,242	High	Elevated	High	Elevated	High	Elevated	Elevated
Fayette	22,140	Severe	Elevated	High	Guarded	High	Elevated	Elevated
Ford	14,081	Severe	Elevated	Severe	Guarded	Elevated	Guarded	Elevated

County Name	Population	Severe Storms	Floods	Severe Winter Storms	Drought	Extreme Heat	Earthquake	Tornado
Franklin	39,561	Severe	Elevated	High	Elevated	Elevated	High	Elevated
Fulton	37,069	Severe	High*	High	Guarded	Elevated	Guarded	High
Gallatin	5,589	Severe	Elevated	High	Elevated	Elevated	High	Elevated
Greene	13,886	Severe	Elevated	High	Guarded	Elevated*	Elevated	Elevated
Grundy	50,063	Severe	High	High	Guarded	Elevated	Guarded	High
Hamilton	8,457	Severe	Elevated	High	Elevated	Elevated	High	Elevated
Hancock	19,104	Severe	Elevated	High	High	Elevated	Guarded	High
Hardin	4,320	High	Elevated	High	Elevated	High	High	Guarded
Henderson	7,331	High	High*	High	Elevated*	Elevated	Guarded	Elevated
Henry	50,486	Severe	Elevated	High	High	Elevated	Guarded	High
Iroquois	29,718	Severe	Elevated	High	Guarded	Elevated	Guarded	High*
Jackson	60,218	Severe	High	High	High	Elevated	High	Elevated
Jasper	9,698	Severe	Elevated	High	Elevated	Elevated	Elevated	Elevated
Jefferson	38,827	Severe	Elevated	High	Elevated	High	High	High*
Jersey	22,985	High	Elevated	High	Guarded	High	Elevated	Elevated
Jo Daviess	22,678	Severe	Elevated	High	High	Elevated	Guarded	Guarded
Johnson	12,582	Severe	Elevated	High	Elevated	Elevated	High	High*
Kane	515,269	Severe	Elevated	High	Guarded	Guarded	Guarded	Elevated
Kankakee	113,449	Severe	Elevated	High	Guarded	Elevated	Guarded	High
Kendall	114,736	High	Elevated	High	Guarded	Guarded	Guarded	High*
Knox	52,919	Severe	Elevated	High	Guarded	Elevated	Guarded	High*
Lake	703,462	Severe	Elevated	High	Guarded	Guarded	Guarded	Elevated
La Salle	113,924	High	Elevated	High	Guarded	Elevated	Guarded	Elevated
Lawrence	16,833	High	Elevated	High	Elevated	Elevated	Elevated	Elevated
Lee	36,031	High	Elevated	High	Guarded	Elevated	Guarded	Elevated
Livingston	38,950	High	High*	High	Guarded	Elevated	Elevated	High*
Logan	30,305	Severe	Elevated	High	Elevated	Elevated	Elevated	High
McDonough	32,612	Severe	Elevated	High	Elevated*	Elevated	Guarded	High*
McHenry	308,760	Severe	Elevated	High	Guarded	Guarded	Guarded	High
McLean	169,572	Severe	Elevated	High	Elevated	Elevated	Guarded	High
Macon	110,768	Severe	Elevated	High	Elevated	Elevated	Elevated	High
Macoupin	47,765	Severe	Elevated	High	Guarded	High	Elevated	High*
Madison	269,282	Severe	Elevated	High	Guarded	High	Elevated	High
Marion	39,437	Severe	Elevated	High	Guarded	High	High	Elevated
Marshall	12,640	Severe	Elevated	High	Elevated	Elevated	Guarded	Elevated
Mason	14,666	High	Elevated	High	Elevated	Elevated	Guarded	Elevated
Massac	15,429	High*	Elevated	High	High	Elevated	High	High*

County Name	Population	Severe Storms	Floods	Severe Winter Storms	Drought	Extreme Heat	Earthquake	Tornado
Menard	12,705	Severe	Elevated	High	Elevated	Elevated	Elevated	High*
Mercer	16,434	Severe	High*	High	Elevated*	Elevated	Guarded	Elevated
Monroe	32,957	Severe	Elevated	High	Guarded	High	High	Elevated
Montgomery	30,104	Severe	Guarded	High	Guarded	Elevated*	Elevated	Elevated
Morgan	35,547	Severe	High	High	Elevated	Elevated	Elevated	Elevated
Moultrie	14,846	Severe	Elevated	High	Elevated	Elevated	Elevated	Guarded
Ogle	53,497	High	Elevated	High	Guarded	Elevated	Guarded	Elevated
Peoria	186,494	Severe	High*	High	Elevated	Elevated	Guarded	High
Perry	22,350	Severe	Elevated	High	Elevated	High	High	High*
Piatt	16,729	Severe	High*	High	High	Elevated	Elevated	Elevated
Pike	16,430	High	Elevated	High	Guarded	High	Elevated	Elevated
Pope	4,470	High	Elevated	High	Elevated	Elevated	High	Elevated
Pulaski	6,161	High	High*	High	Elevated	Elevated	Severe	High*
Putnam	6,006	Severe	Guarded	High	Elevated*	Elevated	Guarded	Elevated
Randolph	33,476	High	Elevated	High	Guarded	High	High	Elevated
Richland	16,233	High	High*	High	Elevated	Elevated	High	Elevated
Rock Island	147,546	Severe	Elevated	High	High	Elevated	Guarded	Elevated
St. Clair	270,056	Severe	Elevated	High	Guarded	High	High	High
Saline	24,913	Severe	High	High	Elevated	Elevated	High	High*
Sangamon	197,465	Severe	High	High	Elevated	Elevated	Elevated	High
Schuyler	7,544	Severe	Elevated	High	Elevated	Elevated	Guarded	High*
Scott	5,355	Severe	Elevated	High	Elevated	High	Elevated	Elevated
Shelby	22,363	Severe	Elevated	High	Elevated	Elevated	Elevated	High
Stark	5,994	High	Guarded	High	Elevated	Elevated	Guarded	Elevated
Stephenson	47,711	Severe	Elevated	High	Elevated*	Elevated	Guarded	Elevated
Tazewell	135,394	Severe	High*	High	Elevated	Elevated	Guarded	High
Union	17,808	Severe	Elevated	High	Elevated	Elevated	Severe	High*
Vermilion	81,625	Severe	Elevated	High	Elevated	Elevated	Elevated	High
Wabash	11,947	Severe	Elevated	High	Elevated	Elevated	High	High
Warren	17,707	Severe	Elevated	High	High	Elevated	Guarded	Elevated
Washington	14,716	Severe	Elevated	High	Guarded	High	High	Elevated
Wayne	16,760	Severe	Elevated	High	Elevated	Elevated	High	Elevated
White	14,665	Severe	High	High	Elevated	Elevated	High	High*
Whiteside	58,498	Severe	Elevated	High	High	Elevated	Guarded	Elevated
Will	677,560	Severe	High	High	Guarded	Guarded	Guarded	High
Williamson	66,357	Severe	Elevated	High	Elevated	Elevated	High	High
Winnebago	295,266	Severe	High	High	Guarded	Elevated*	Guarded	Elevated
Woodford	38,664	Severe	Elevated	High	Elevated	Elevated	Guarded	Elevated

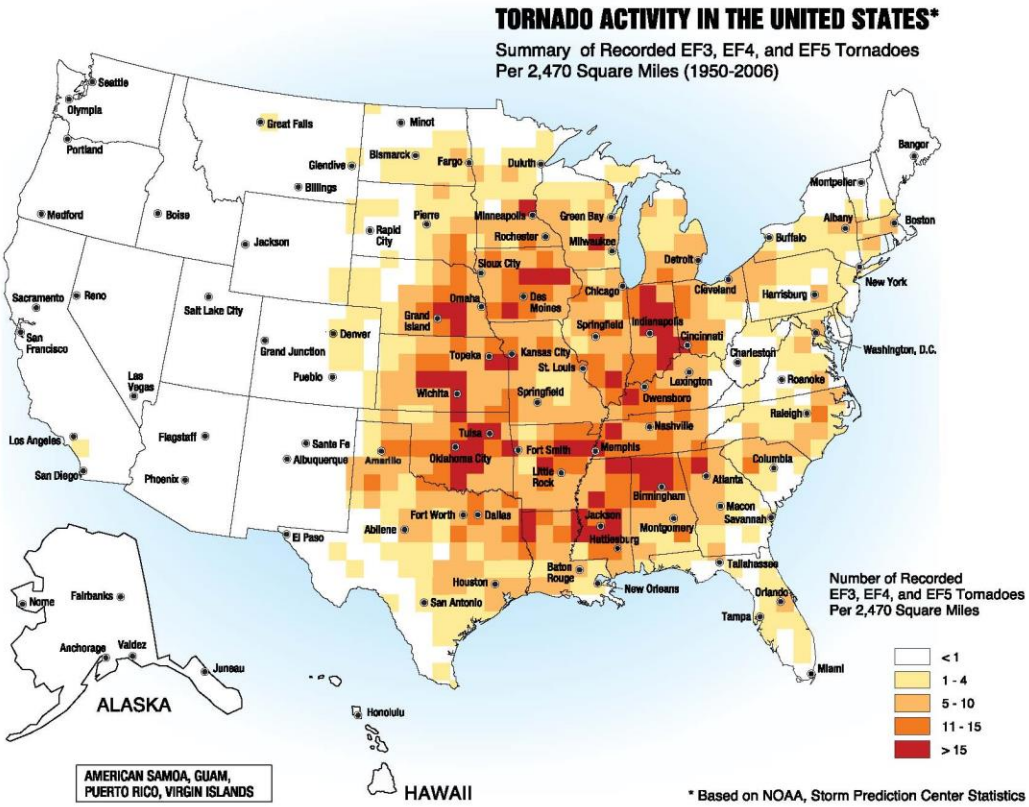
C. Severe Storms and Tornadoes (Wind, Lightning and Hail)

Description

In Illinois thunderstorms occur when there is a collision of moist, warm air moving north from the Gulf of Mexico with colder fronts moving east from the Rocky Mountains resulting in cold air overriding a layer of warm air causing the warm air to rise rapidly. Thunderstorms may occur singly, in clusters, or in lines. In the course of a few hours, it is possible for several thunderstorms to affect one location or a single thunderstorm to affect one location for an extended time. Thunderstorms typically are 15 miles in diameter and produce heavy rain anywhere from 30 minutes to an hour.

Of the estimated 100,000 thunderstorms each year approximately 10 percent are classified severe. Severe storms either produce hail at least one inch in diameter, have winds of 58 miles per hour or higher, or produce a tornado. In Illinois, severe thunderstorms frequently occur in the late afternoon or evening. Thunderstorms can bring heavy rain, strong winds, hail, lightning and tornadoes. Thunderstorms can cause several types of damaging wind. The public is not as familiar with the extent of damage that may accompany a downburst or straight line winds as they are with tornadoes.

The peak tornado season runs March through August, however a tornado can occur in any month in Illinois. Tremendous destruction can occur in paths over a mile wide and 50 miles long with winds in excess of 200 mph. The Enhanced Fujita Scale shown on the next page uses the categories of EF0 through EF5 to rate the strength of tornadoes in the United States estimated by the damage they cause. Implementation of this enhanced scale began February 1, 2007. None of the tornadoes recorded on or before January 31, 2007, will be re-categorized.



Enhanced Fujita Scale

According to the National Service Forecast Office, the Enhanced Fujita Scale or EF Scale, which became operational on February 1, 2007, is used to assign a tornado a 'rating' based on estimated wind speeds and related damage. When tornado-related damage is surveyed, it is compared to a list of Damage Indicators (DIs) and Degrees of Damage (DoD) which help estimate better the range of wind speeds the tornado likely produced. From that, a rating (from EF0 to EF5) is assigned.

Category EF0	(65-85 mph)	Light damage. Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over.
Category EF1	(86-110 mph)	Moderate damage. Roofs severely stripped: mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
Category EF2	(111-135 mph)	Considerable damage. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
Category EF3	(136-165 mph)	Severe damage. Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
Category EF4	(166-200 mph)	Devastating damage. Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
Category EF5	(>200 mph)	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (109 yd.); high-rise buildings have significant structural deformation; incredible phenomena will occur.

The EF Scale was revised from the original Fujita Scale to reflect better examinations of tornado damage surveys so as to align wind speeds more closely with associated storm damage. The new scale has to do with how most structures are designed.

The National Weather Services advised that it is important to note that the EF scale still is a set of wind estimates (not measurements) based on damage. Its uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators listed below. These estimates vary with height and exposure. Important: The 3 second gust is not the same wind as in standard surface observations. Standard measurements are taken by weather stations in open exposures, using a directly measured, "one minute mile" speed.
http://www.srh.noaa.gov/oun/?n=efscale

A downward rush of cool descending air from a thunderstorm is a downburst. The air rushing to the ground may look like a cloud or shaft of heavy rain. Once the air strikes the ground at a high speed, the air usually spreads out in all directions. The wind may be 100-150 miles per hour which is as strong as an EF1 or EF2 tornado and exceeds the lower limit of a hurricane. Downburst winds will damage roofs, overturn or push mobile homes off foundations, push autos off the road and may destroy attached garages. A linear group of thunderstorms, typically ahead of a cold front, can produce what is known as “straight-line” winds. High wind from straight-line gusts can reach speeds of 40 to 50 mph up to 110 mph. The width of the damage path can be several miles up to tens of miles. The damage path length can extend from tens of miles to hundreds of miles. Thunderstorm downbursts and straight-line winds are the leading cause of wind related damage.

According to the National Weather Service; some weather patterns can produce what is called a derecho. A derecho is a fast moving windstorm that is made up of thunderstorms that repeatedly develop along the leading edge. These lines or storms can move very quickly and produce widespread straight-line winds over long periods of time. Derechos can move anywhere from 35-70 mph and last 8 hours or more. Most derechos that produce severe weather move at speeds greater than 50 mph. Warm season events probably move a little slower than cold season events (www.nssl.noaa.gov).

Lightning occurs during all thunderstorms and is an electrical discharge that results from the buildup of positive and negative charges. Lightning appears as a “bolt” when the buildup becomes strong with the flash of light occurring between the clouds and the ground. In a split second the bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit. Thunder is the rapid heating and cooling of air near the lightning.

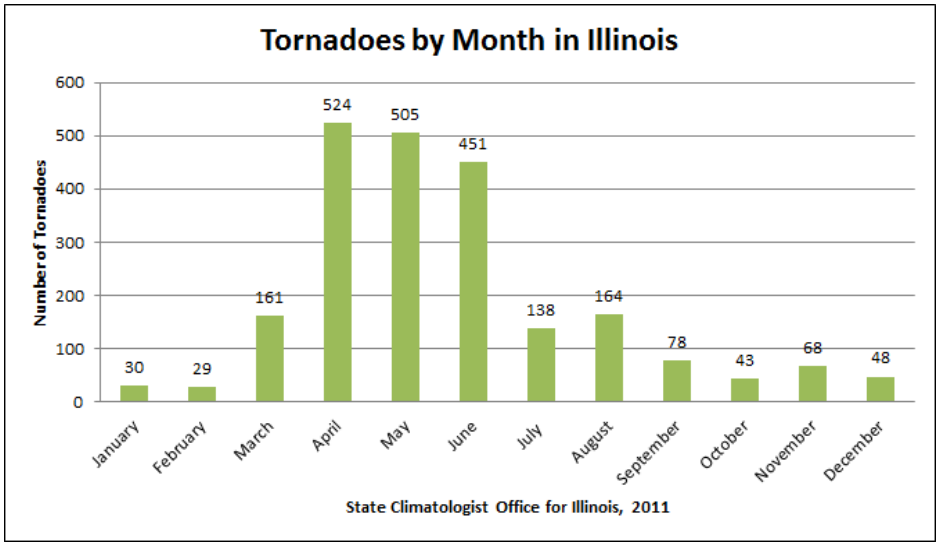
In addition to lightning, a thunderstorm can also produce hail which can be very destructive to plants/crops, animals and property causing over a billion dollars in damage each year nationally. Hail can be as small as a pea and as large as a softball. Most hail has a diameter smaller than a dime; however, there are records of hailstones weighing more than a pound.

These balls of ice are a large frozen raindrop. Super cooled water droplets hit ice crystals and freeze instantly. The hailstones grow as more and more droplets hit these ice balls and freeze as they fall through the clouds. As the hailstones reach the bottom of the clouds the wind updrafts may send the hail back up into the cloud to repeat the process and continue to grow. When the weight of the hailstones becomes too heavy to be supported by the updrafts, they fall out of the clouds. The very largest recorded hailstone in Illinois was over 5.6 inches in diameter and weighed 26 ounces, however, usually large hail is less than two inches in diameter and as stated above most is smaller than a dime. Most thunderstorms have hail, but not all thunderstorms produce hail at the ground. Temperatures at the upper levels of a thunderstorm are well below freezing, allowing for the development of hail, but sometimes it melts before reaching the surface of the earth. (www.nssl.noaa.gov)

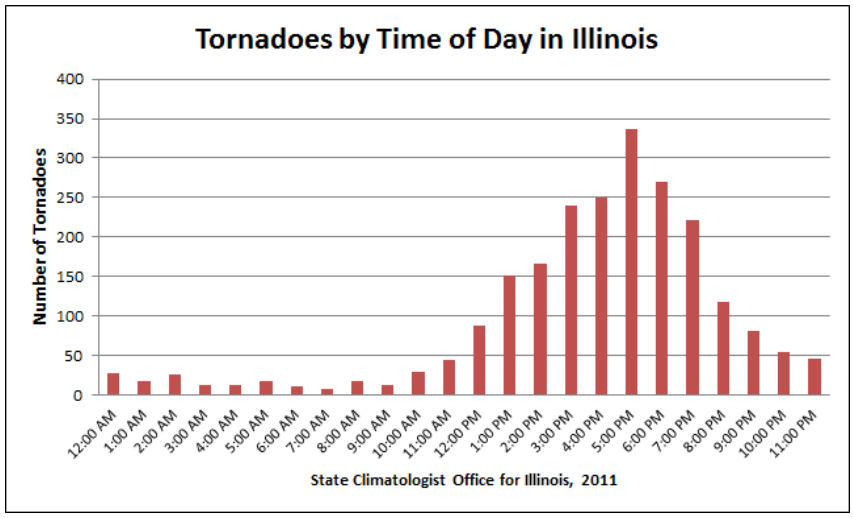
Historical Data

Illinois is situated on the northeast edge of "tornado alley," the tornado-prone area that extends approximately 400 miles on either side of a line from Fort Worth, Texas, to Detroit, Michigan. This area is the battleground of warm, moist air from the Gulf of Mexico and cold air from Canada, resulting in the world's leading breeding area for twisters. The greatest frequency of tornadoes in Illinois occurs in a wide band from Madison and St. Clair counties northeastward to Lake and Cook counties.

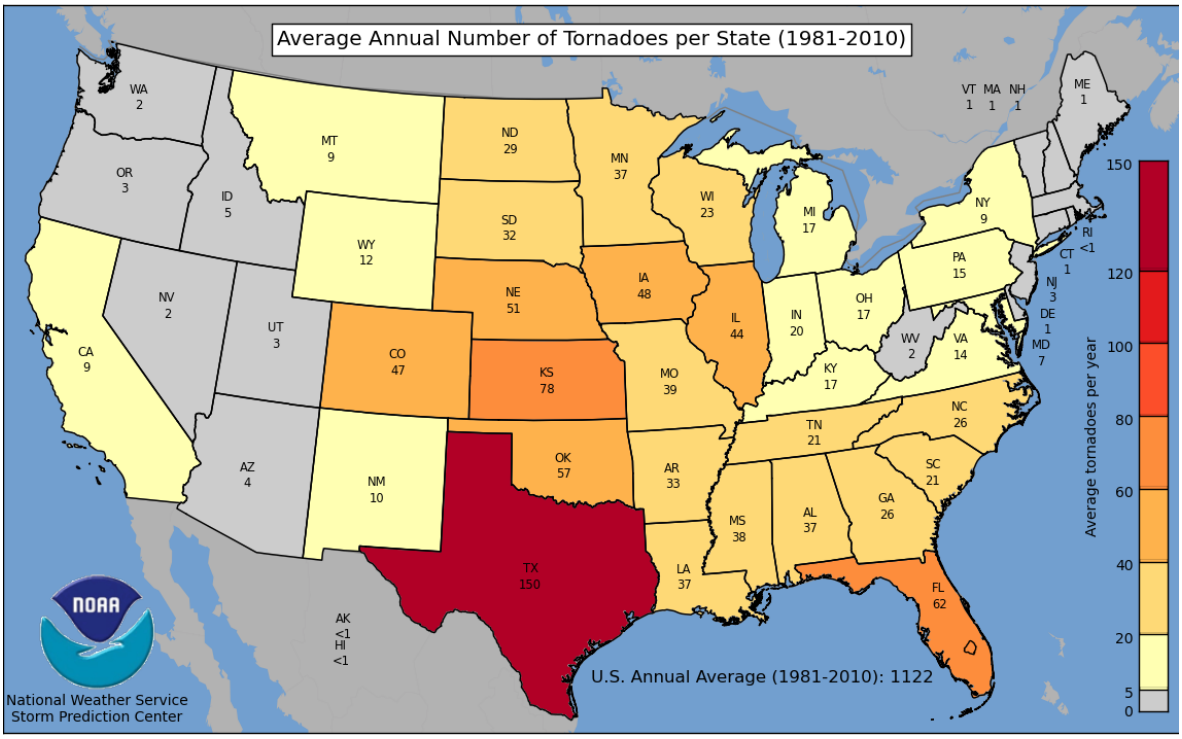
Officially, there have been 2,199 tornadoes in Illinois from 1950 through December 31, 2012. Tornadoes can and do occur in any month of the year. Contrary to the belief that there are numerous tornadoes in March, during the last fifty years the primary tornado season in Illinois has been April, May and June. Of the 2,199 tornadoes recorded since 1950, 66 percent (1,457 in number) occurred during the above three months. More than half of all tornadoes occur between the hours of 3:00 PM and 7:00 PM, but they can occur at any time of day or night.



Graphs supplies by Illinois State Water Survey-University of Illinois



Since 1950, Illinois has averaged 39 tornadoes per year; however, in some years, this average was greatly exceeded. In 1974, 107 tornadoes were reported, and in 1998, 99 were reported followed by 64 in 1999, 2003 recorded 120. The year of 2006 had a record number of tornadoes with 124 tornadoes occurring. According to NOAA; About 1,300 tornadoes hit the U.S. yearly. Since official tornado records only date back to 1950, we do not know the actual average number of tornadoes that occur each year. Tornado spotting and reporting methods have changed a lot over the last several decades which have increased the accuracy of reporting numbers.



Graph Supplied by National Weather Service Storm Prediction Center

Illinois has one of the higher tornado death tolls of the 50 states due to rare, intense tornadoes that have directly struck towns or cities. Since 1916, the State has recorded 1,129 tornado deaths. Of the 921 deaths prior to 1953, 695 occurred in 1925 in the Great Tri-state Tornado. This is the deadliest tornado in

United States history. From 1950 through 2012, there have been 212 deaths in Illinois due to tornadoes. Twenty-nine of these came in the Plainfield-Joliet tornado on August 28, 1990 (FEMA 878-DR). This was the worst to hit Illinois since 1967, when a twister struck Oak Lawn and Belvidere, killing 57.

Tornado outbreaks on May 9, 13, and 18, 1995 brought 54 tornadoes throughout the entire State, five reaching the F3 level and two the F4 level of the Fujita Scale. Even though there were no deaths attributed to these twisters, 87 people were injured, and the F3 and F4 tornadoes alone caused over $37,800,000 in property damage. Tornado outbreaks of this magnitude are not uncommon in Illinois.

Another such outbreak occurred on April 19 of 1996 (FEMA-1110-DR) when 41 tornadoes were reported across Central and East-central Illinois. In this outbreak, one tornado was reported to have been on the ground for over 3.5 hours and traversed virtually the entire State from eastern Pike County into Indiana. Nearly 90 percent of Ogden, a small town east of Champaign, was impacted when this tornado moved through Champaign County. A path of such incredible length is similar to the devastating tornadoes in Illinois in 1917 and 1925. However, due to the improved warning systems as well as what lies in the path of tornadoes, only one person was killed in 1996 versus 695 fatalities in 1925. When comparing the 102 counties in Illinois, the five leading tornado counties by square mile are: Will-(60 tornadoes), Logan (59), McLean (103), Sangamon (75), and Tazewell (54) (see pages 30-32).
April and May 2002 saw an outbreak of tornadoes beginning in Wayne County on April 21st with seven more occurring on April 28th in Clay, Franklin, Johnson, Pope, Saline, St. Clair and Union counties and the last one occurring May 9th in Marion County. These tornadoes resulted in five fatalities, 100 injuries, over 20 homes destroyed and approximately 200 damaged. (FEMA 1416-DR)

Between May 4 and May 10, 2003, tornadoes and damaging winds struck the extreme southern tip and the mid-western portion of the State. This week was unprecedented in American meteorological history. A series of damaging storms that included nearly 400 tornadoes covered seven states including 214 counties. In Illinois, twenty-six tornadoes struck thirteen counties during this time period. One of the 26 tornadoes was a F4 tornado that struck Southern Illinois and another of the 26 was a F3 that struck Central Illinois. One of these was 1,000 yards wide and traveled for 14 miles and the other one traveled 33 miles in distance. This outbreak of tornadoes resulted in two fatalities that occurred during the storms (one additional death resulting from a heart failure suffered during the cleanup efforts was reported and is attributed to the event) and 75 injuries. Approximately 25 homes were destroyed and approximately 200 homes damaged with property damage exceeding 35 million. Flooding also occurred during this period and a total of 16 counties received the Federal Disaster Declaration. (FEMA 1469-DR)

On the evening of April 20, 2004, fifteen tornadoes were spotted across northern Illinois. The core counties with the greatest damage were Kankakee, LaSalle, Putnam and Will. The Village of Utica in LaSalle County was struck by an F-3 tornado resulting in eight deaths, four serious injuries and serious impacts to the downtown area (businesses, city hall, elementary school and fire station). The F-3 tornado in Utica caused 8 deaths when a building collapsed where individuals were seeking safe shelter from the storm. In Granville, in Putnam County, six blocks of modest homes suffered major to minor damage. In addition to

the loss of life, these storms caused seven injures and over $4 million in damage (over 660 homes damaged, 20 destroyed and 87 with major damage). (FEMA 1513-DR)

On March 12, 2006, an unusually long-tracked supercell thunderstorm moved across the Central United States. The supercell caused significant damage across several Central Illinois counties. Although Sangamon County received the most damage, Green, Logan, Morgan, Randolph and Scott counties also received damage. A significant portion of the storm was caused by straight-line winds as opposed to tornados; however two F2 tornados also caused much damage, especially in the City of Springfield. More than two dozen people were injured, the damages totaled over $15 million in public (business and government) and private property damage and thousands lost electricity for days. (FEMA 1633-DR)

On February 29th, 2012, a severe thunderstorm produced a devastating EF4 tornado in Southern Illinois. The tornado had an average width of 275 yards and a track length of over 26 miles. The tornado originally touched down 1 mile north of Carrier Mills and tracked to Harrisburg. The deadly tornado resulted in over 100 injuries and 8 fatalities and destroyed or heavily damaged over 200 homes and approximately 25 businesses.

The following list of tornadoes, recorded by IEMA, have occurred in Illinois in recent years. In some cases the FEMA number or predecessor agency number is in parentheses.

March 18, 1925	Tri-State Tornado was the deadliest and most powerful tornado in the United States history. It killed 695 people, injured 2000, destroyed 15,000 homes and 40% of Murphysboro, IL was destroyed. It's 219 mile path began in Missouri and stayed on the ground until it ended in Indiana three and a half hours later. At times it reached one mile in width.
March 4, 1961	Chicago South Side (91st and Western northeast to 67th Street and Lake Michigan), 1 person killed, with more than 115 people injured and over $7 million in damages
April 21, 1967 (OEP 227-DR)	Cities of Belvidere and Oak Lawn in northern Illinois, 57 killed, close to 1000 injured, and over $100 million in damages.
April 3, 1974 (FDAA 427-DR)	Decatur in Macon County, 1 person killed, 26 injured, and $2 million in damages.
April 3, 1974 (FDAA 438-DR)	Morris in Grundy County, 2 people killed, over 1000 injured state-wide, and $25 million in damages.

May 20, 1975	Park Ridge and northeast Chicago area, 1 person killed, 6 injured, and $2 million in damages.
July 23, 1975 (FDAA 478-DR)	Canton in Fulton County, 3 people killed, more than 69 injured, and $7 million in damages.
March 12, 1976	Wilmette - northern Chicago suburbs, 2 people killed, 41 injured, and $14 million in damages.
June 13, 1976 (FDAA 509-DR)	Downers Grove and Lemont - 2 people killed, 23 injured, and $3 million in damages.
May 29, 1982 (FEMA 660-DR)	Marion in Williamson County; Conant in Perry County in southern Illinois - 12 people killed, 188 injured, $100 million in damages.
December 2, 1982 (FEMA 674-DR)	New Baden in Clinton County - 2 killed, no injuries, but $20 million in damages (27 counties total of which 26 were for flooding).
April 27, 1984	Grundy County and Plainfield in Will County - 1 killed, 5 injured, and $3 million in damages.
January 7, 1989 (FEMA 819-DR)	Allendale in Wabash County in southern Illinois - No fatalities, but $1.3 million in damages.
June 20, 1990 (FEMA 871-DR	Findlay in Shelby County and Newton in Jasper County, Wabash County in southern Illinois - 1 killed (Wabash Co.), 13 injured, and $6.4 million in damages.
August 28, 1990 (FEMA 878-DR)	Plainfield and Joliet in Will County - 29 killed, 350 injured, and $200 million in damages.
November 19, 1991	Marion in Williamson County - No fatalities, 24 injured, and $3.6 million in damages, SBA declaration.
April 19, 1996 (FEMA 1110-DR	Ogden in Champaign County and Decatur in Macon County - 1 killed. 41 tornadoes in one day - Illinois record.
April 21-May 9, 2002 (FEMA 1416-DR)	April 21st, Wayne County - 1 death and 42 injuries April 28th, Flora (Clay County), Sesser (Franklin County), Cypress (Johnson County), Golconda (Pope County), Galatia (Saline County).

	Belleville, Swansea and Shiloh (St. Clair County) and Dongola (Union County) - 2 fatalities and 49 injuries. May 9th, Centralia (Marion County) - 2 deaths, 9 injuries, 10 homes and 12 mobile homes destroyed, 194 damaged.
May 2003 (FEMA 1469-DR)	May 4 and 6, Massac County (Joppa and Hillerman) May 4 and 6, Pope County (Golconda, Bay City and Temple Hill) May 6, Pulaski County (Grand Chain); Alexander County (Willard) May 10, Adams County (Meyer and Liberty); Hancock County (Tioga); McDonough County (Tennessee); Brown County (Timewell); Schuyler County (Rushville); Fulton County (Ipava and Astoria); Mason County (Havana and Manito); Tazewell County (South Pekin and Morton); Woodford County (Eureka) and Jasper County (Wheeler) - 2 deaths, 75 injuries, 28 homes destroyed and 194 damaged.
July 4, 2003	Cook, Hancock, Henry, Iroquois, McLean, Stark and Winnebago - destruction to homes, businesses, other structures and trees causing broken power lines.
May 30 & 31, 2003	Logan and DeWitt counties - destruction to homes, businesses, other structures and trees.
April 20, 2004 (FEMA 1513-DR)	Kankakee, LaSalle, Putnam and Will counties - 8 deaths, 7 injuries, over 660 homes damaged, 20 destroyed, 87 with major damage and over $4 million in damage. All received individual assistance and only LaSalle and Putnam received public assistance.
May 24 & 26, 2004	Hardin, Morgan, Pike and Scott counties - homes and businesses damaged, topped trees and power lines causing one fatality.
July 13, 2004	Danville and Vermilion County, Champaign and Woodford counties - 500 homes and businesses, industrial buildings and farm operations damaged, downed trees and power lines.
March 11-13, 2006 (FEMA 1633-DR)	Sangamon County (Springfield), Greene, Logan, Morgan, Randolph, Scott – more than two dozen injured, over $15 million in damage: public (business and government) and private property damage, thousands lost electricity for days. All received public assistance. Greene, Morgan and Sangamon counties received individual assistance.
April 2, 2006	Central Illinois (18 counties) - one death, dozens of injuries, 564 homes and 91 businesses damaged.

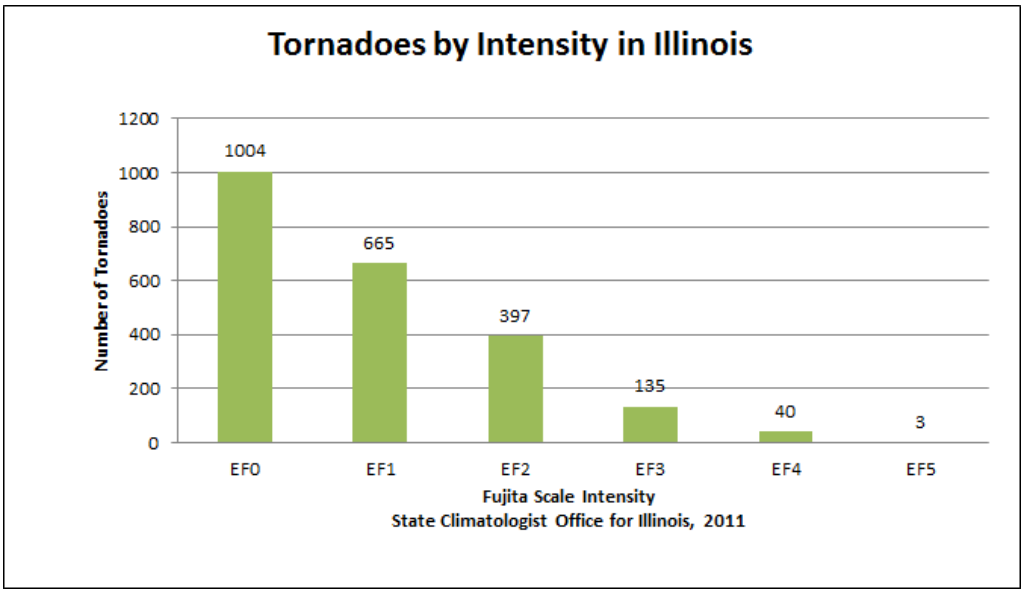
July 19 & 21, 2006	Metro East area continuing through Mt. Vernon - homes and businesses damaged, power outages intensifying extreme heat
Sept. 26, 2006	A series of tornadoes in Cook, Jackson, Pope, Massac, Washington, and Pike Counties formed as a result of a cold air system moving east from the Rocky Mountains. Caused over $1.3M worth of damage
August 23, 2007	An F1 tornado with a path length of 2.67 miles and a path width of 300 to 500 yards was confirmed in DuPage county. Damage to trees and minor structural damage was reported.
January 7, 2008	An F3 tornado touched down at 330 pm CST about 1.2 miles north of Popular Grove in Boone County and ended at 348 pm about 3.2 miles northeast of Harvard in McHenry County. The tornado crossed the Boone McHenry County line and approximately $4M worth of damage was reported.
June 7th, 2008	A single thunderstorm that produced eight different tornadoes as it moved east across Illinois caused more than $11.5M in damage in Livingston, Kankakee, Will, and Cook Counties.
May 8th, 2009 (FEMA 1850-DR)	The Storm, known as a Derecho, produced 39 tornadoes in its path including two F-3's.
August 19th, 2009	The tornado touched down on the west side of Williamsville, just west of I-55, at 319 PM CST. The maximum wind speed at this point was estimated at 140 mph (EF3). The tornado continued through fields, causing extensive crop damage, until crossing into Logan County around 326 PM CST. Seven tornadoes touched down on August 19th, affecting parts of Scott, Morgan, Sangamon, Logan, DeWitt, McLean, and Vermilion counties.
June 5th, 2010	Showers and thunderstorms moved east across portions of central and northern Illinois during the overnight and early morning hours. Twelve tornadoes were confirmed by the National Weather Services to have moved across portions of northern, causing significant damage across portions of La Salle, Livingston and Kankakee Counties. Six of these tornadoes appear to have been associated with particular cyclic supercell storm. The storm produced 6 - (EF-0), 2 – (EF-1), 2 – (EF-2), 2- (EF-3) tornadoes.

April 29th, 2011 — A severe outbreak of thunderstorms caused two EF-2 tornados and a third EF-3 in Montgomery and Macoupin Counties in the early evening of April 29th, causing significant damage to homes, outbuildings, farm steads and power poles. The EF-2 tornados touched down in Honey Bend and Farmersville, while the EF-3 struck Girard.

February 29th, 2012 — A severe thunderstorm produced a devastating EF4 tornado in Williamson County. The tornado had an average width of 275 yards and a track length of over 26 miles. The tornado originally touched down 1 mile north of Carrier Mills and tracked to Harrisburg. Over 200 homes and approximately 25 businesses were heavily damaged or destroyed. The tornado resulted in over 100 injuries and 8 fatalities.

The following is a graph supplied by the Illinois State Water Survey depicting tornadoes by intensity in Illinois. Using tornado statistics provided by the National Climatic Data Center, Michael Patrick a senior (2011) in the Department of Atmospheric Science at the University of Illinois explored the relationship of selected tornado characteristics as part of a Capstone project. This graph below shows the number of tornadoes in each category of the Fujita scale. The majority of the tornados in Illinois are at the weaker end of the Fujita scale. These "EF0", tend to cause little if any damage and injuries or deaths are rare. The worst category of tornadoes, an "EF5", are extremely rare. Only three have occurred in the records since 1950.

Tornadoes, Fatalities, and Injuries by F-Scale



Although they do not receive as much recognition as tornado events, thunderstorm winds cause more damage year-to-year than tornadoes. In 1993 alone, 38 events of thunderstorm winds caused a minimum estimate of well over five million dollars in damage, while the 34 tornadoes caused a maximum of just over 1.5 million dollars. Seven severe thunderstorms traversed the State in June of 1993, creating most of this damage, but significant losses occurred in seven other months. In the 10-year period from 1981 to 1990, damage estimates from severe wind equaled or exceeded damages caused by tornadoes in five of the years. In addition, death tolls from severe winds exceeded tornado deaths for six of these years, and the number of injuries caused by severe wind was greater in three years. (Data from *Storm Data* publication, NOAA/NWS). The damages caused by high winds have been relatively consistent from year-to-year.

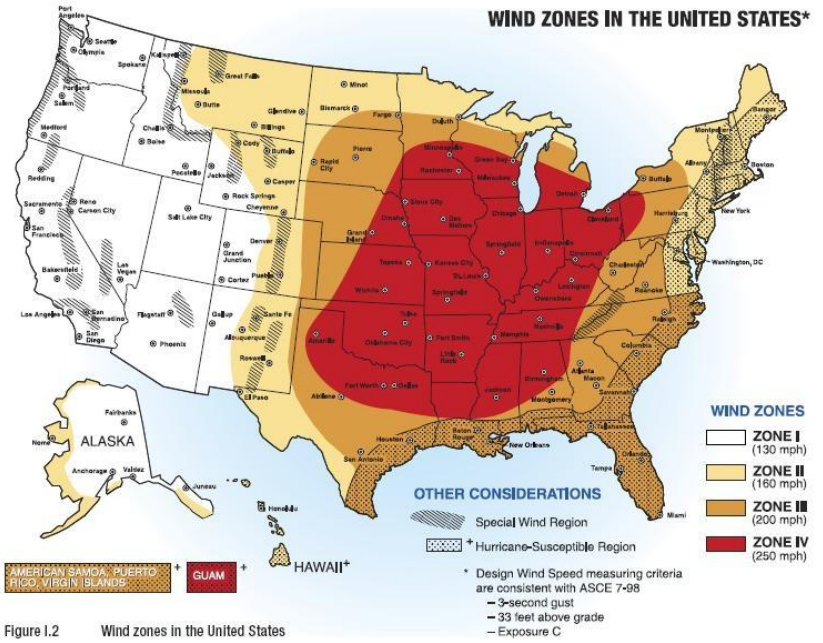


Figure I.2 Wind zones in the United States

In May of 2009, an extremely progressive storm moved from Southeastern Kansas, into Southern Missouri and ending up in Southwestern Illinois. The Storm, known as a Derecho, produced 39 tornadoes in its path including two F-3's. A Derecho is described as a widespread and straight-lined windstorm that often has a band of rapidly moving thunderstorms associated with it. These conditions are ripe for generating multiple tornadoes that can cause severe damage. Southern Illinois suffered damaging winds of above 80 mph, as well as numerous reports of flash flooding. It is estimated that at one point, 68,000 people were left without power as a result of the storm.

Lightning occurs during all thunder storms. Lightning is the buildup and discharge of electrical energy between positively and negatively charged areas. Lighting kills more people than tornadoes or hurricanes. Most lightning fatalities and injuries occur outdoors at recreation events and under or near trees. Lightning is most likely to happen in the spring and summer during late afternoon and evening. Nationwide it is estimated that 25 million cloud-to-ground lightning flashes occur each year, 1,000 people are injured, 60 are killed with about $5 billion in economic impact resulting from lightning. According to Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, "Illinois experiences nearly 650,000 lightning strikes each year." Illinois ranks high among the 50 states for lightning fatalities. Over the past 50 years, 99 people have been killed by lightning in Illinois. As a result IEMA and NWS have established the Lightning Safety Awareness Week as a public education project.

Hail occurs frequently in Illinois averaging 74 times a year or 3,951 times since 1950. There have been no deaths, but 23 injuries. Hail does extensive damage: property damage over $73 million and crop damage over $5 million in the last 53 years. The potential size of hail stones illustrate the damage they can cause. April 23, 1961, several six inch hail stones were reported in Kankakee, IL. While six inches is very unusual, 46 events had hail stones greater than three inches and in the 2-3 inch range 281 events occurred causing 15 of the 23 injuries.

Risk Analysis

Severe storms, tornadoes, winds, lightning and hail all occur separately and together in various combinations in Illinois. The historical data supports the fact that severe storms and tornadoes can and do happen here frequently. It is impossible to predict when and where one of these storms may occur.

Tornadoes are more likely to happen between 3PM and 7PM during April, May and June, however, as previously described there are no absolutes.

In 25 years, the State has had 10 wind related Presidential Disaster Declarations. This calculation is a wind event every two and one-half years severe enough for a federal declaration. Tornados/high winds are a continuous threat to the State as discussed in the next paragraph and indicated on the maps.

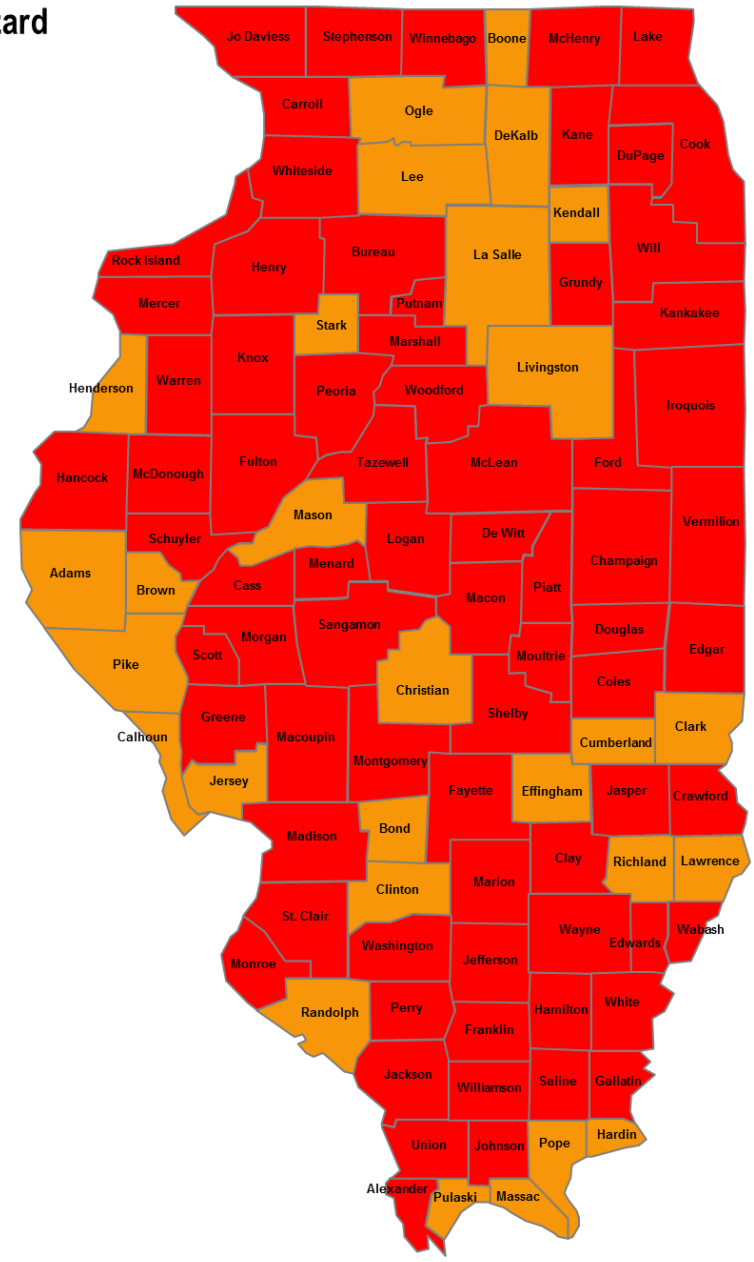
Pages 28 and 29 have maps indicating risk by county for severe storm and tornado. The Severe Storm Map shows the whole State is in a high to severe category for a severe storm. The Tornado Map indicates an elevated to high pattern from St. Louis to Northeastern Illinois. History verifies that tornadoes have and will strike all areas of the State. In 2003, an F4 tornado struck the southern tip of the State and an F4 struck the northern Belvidere area in 1967. F5 tornadoes, the most severe, have occurred in Illinois. Three are listed here: in December, 1957, in Perry County, and August, 1990, in Kendall and Will counties. One of these F5 tornadoes was in southern Illinois and the other two were in northern Illinois.

History proves that at any time of the day and on any day of the year an F5 tornado could strike any place in Illinois. This path of destruction could be over a mile wide and as much as 50 miles long.

As stated, the entire State is vulnerable to Tornadoes and high winds. Unfortunately, the State does not have a uniform standard building code. All areas in the State are at risk and each unit of government adopts and enforces the building codes they chose. The State has no authority in this matter and based on information received from the Capital Development Board, Division of Building Codes and Regulations Planning Team Member there is strong opposition to a statewide uniform building code.

IEMA **Illinois Natural Hazard Mitigation Plan**

Severe Storms Hazard Rating by County



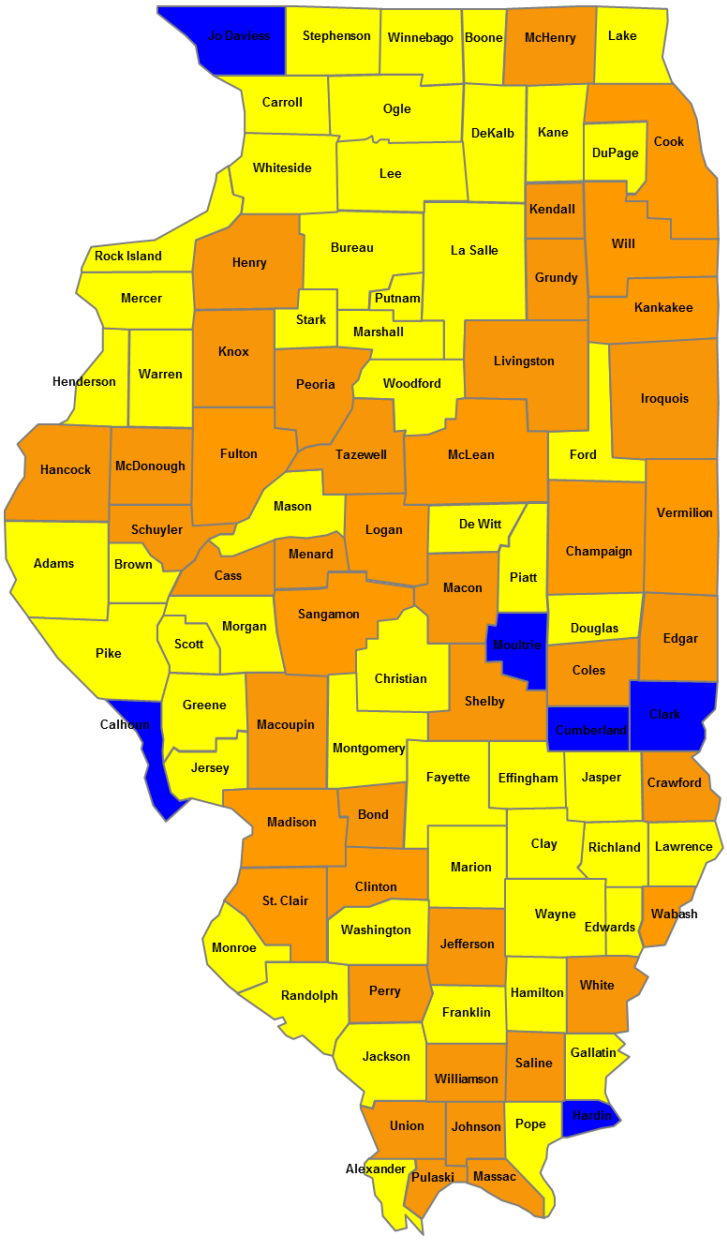
Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a county by county basis

IEMA **Illinois Natural Hazard Mitigation Plan**

Tornado Hazard Rating by County



Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a county by county basis

TORNADO RANK BY COUNTY
Normalized by Tornadoes per 100 square miles
Between 1950 and 2012

				59/581 x 100 = 10.15
RANK	**COUNTY**	**Tornadoes per 100 sq. miles**	**Total Tornadoes**	**County Area (sq. mi)**
1	Will	10.3270	60	581
2	Logan	9.5469	59	618
3	McLean	8.6993	103	1184
4	Sangamon	8.6406	75	868
5	Tazewell	8.3205	54	649
6	Monroe	7.4742	29	388
7	Woodford	7.3864	39	528
8	DuPage	7.1856	24	334
9	Madison	7.1724	52	725
10	Champaign	6.9208	69	997
11	Piatt	6.8182	30	440
12	Wabash	6.7265	15	223
13	Macon	6.6906	56	837
14	Randolph	6.4014	37	578
15	Vermilion	6.0067	54	899
16	Douglas	5.9952	25	417
17	Mason	5.9369	32	539
18	Coles	5.9055	30	508
19	DeWitt	5.7789	23	398
20	Ford	5.7613	28	486
21	St. Clair	5.5723	37	664
22	Alexander	5.5085	13	236
23	Cook	5.3911	51	946
24	Morgan	5.2724	30	569
25	Kankakee	5.0222	34	677
26	Bond	5.0000	19	380
27	Putnam	5.0000	8	160
28	Jackson	4.9320	29	588
29	Mercer	4.8128	27	561
30	Washington	4.7957	27	563
31	Scott	4.7809	12	251
32	Christian	4.6544	33	709
33	Johnson	4.6377	16	345
34	Massac	4.6025	11	239
35	Schuyler	4.5767	20	437
36	Henry	4.4957	37	823
37	Edgar	4.4872	28	624

38	Pulaski	4.4776	9	201
39	Montgomery	4.4034	31	704
40	Jefferson	4.3783	25	571
41	Marion	4.3706	25	572
42	McDonough	4.2445	25	589
43	Warren	4.2357	23	543
44	Rock Island	4.2155	18	427
45	Fulton	4.1570	36	866
46	Kendall	4.0498	13	321
47	Kane	4.0385	21	520
48	Clinton	4.0084	19	474
49	Union	3.8462	16	416
50	Stark	3.8194	11	288
51	Lake	3.7946	17	448
52	Effingham	3.7578	18	479
53	Livingston	3.6398	38	1044
54	Knox	3.6313	26	716
55	Perry	3.6281	16	441
56	Macoupin	3.5880	31	864
57	Calhoun	3.5433	9	254
58	Jersey	3.5230	13	369
59	Adams	3.5006	30	857
60	Iroquois	3.4946	39	1116
61	Cumberland	3.4682	12	346
62	Shelby	3.4256	26	759
63	Crawford	3.3784	15	444
64	Pike	3.3735	28	830
65	Bureau	3.3372	29	869
66	Richland	3.3333	12	360
67	Hancock	3.2704	26	795
68	LaSalle	3.2599	37	1135
69	White	3.2323	16	495
70	Clay	3.1983	15	469
71	Henderson	3.1662	12	379
72	Franklin	3.1553	13	412
73	Carroll	3.1532	14	444
74	Edwards	3.1532	7	222
75	Peoria	3.0645	19	620
76	Lee	3.0345	22	725
77	Pope	2.9650	11	371
78	Menard	2.8662	9	314
79	Marshall	2.8497	11	386

80	Boone	2.8470	8	281
81	Jasper	2.8340	14	494
82	Wayne	2.8011	20	714
83	Whiteside	2.7737	19	685
84	Greene	2.7624	15	543
85	McHenry	2.6490	16	604
86	Brown	2.6144	8	306
87	Saline	2.6110	10	383
88	Winnebago	2.5292	13	514
89	Fayette	2.5140	18	716
90	Ogle	2.5033	19	759
91	Gallatin	2.4691	8	324
92	Lawrence	2.4194	9	372
93	Grundy	2.3810	10	420
94	Stephenson	2.3050	13	564
95	Hamilton	2.2989	10	435
96	Cass	2.1277	8	376
97	Williamson	2.1277	9	423
98	Moultrie	2.0833	7	336
99	DeKalb	1.8927	12	634
100	Jo Daviess	1.8303	11	601
101	Clark	1.7928	9	502
102	Hardin	1.6854	3	178

This table was provided by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL.

Loss Estimation For Tornadoes and Severe Storms

All properties in counties affected by severe storms and tornado-prone were considered at-risk for damages, and the risks for each county were calculated from historic data compiled by the National Climatic Data Center, most importantly the Storm Events Database. The total number of tornadoes and severe storms reported over a 61-year period were divided by the number of years in the reporting period, to establish the annual number of tornadoes and severe storms that each county would be expected to have, in probabilistic terms. Then, an average dollar amount of property damage (not including crop damages), for each event, was compiled from the same data source. The expected number of tornadoes and severe storms per county was then multiplied by the average historic damages reported for each event, to produce an estimate of annual dollar losses. Utilizing the NCDC data tornadoes produced a total of over $29.3 million dollars, while severe storms totaled over $12.5 million dollars statewide in damage. The 61 year period that produces information for this study is 1951 to 2012. Higher risks are associated to areas with increased populations as well as residential growth. Part of this is due to populations shifting to areas previously uninhabited by humans. The population of Illinois has increased by 9.7% since the 2000 Census. Five counties have experienced a population increase of 25% or greater since

2000. These counties include: Boone, Kane, Kendall, Grundy and Will. Kendall County has experienced an increase in population of over 110 percent making it the fastest growing county in Illinois. Three counties experienced a population increase from 15 percent to 25 percent including: McHenry, DeKalb and Monroe. Twelve additional counties experienced a population increase of 5 percent to 15 percent in the state. These counties were represented in a variety of locations throughout the state. The majority of the counties that experienced 25 percent or greater growth were located in the North-Eastern section of the state. However, the additional counties experiencing growth were located in all portions of the state, providing no correlation to geographical location. The remaining 82 counties experienced less than 5 percent growth or negative growth.

Future plans will continue to keep track of these high growth populations and note that they have the potential for higher vulnerability to climate extremes. Census data will aid in providing this information, and will continue to be updated as future Census data is formulated. For an example of how losses were estimated, consider the tornado data for Adams County, which has had 31 reported tornadoes between 1951 and 2012. This translates to an annual probability of 51%. (31/61=.50819672) Each tornado event has averaged $121,355.16 in damage within the county ($3.762 million total damages divided by 31 events) and so $121,355.16 average per event, times a .50819672 chance of an event per year, equals $60,677.58. Some of these figures are rounded off when they appear in the Loss Estimation table.

It should be noted that certain counties may reflect higher numbers than their neighboring jurisdictions. Examples are losses in areas such as Williamson, Will, Madison and Sangamon Co. Since these jurisdictions have had large tornado or severe storm events in the past, the average damage per event is higher in dollar amounts. Our formula looks for the average dollar amount in damages calculated by dividing total previous county damages by the amount of tornadoes. Thus the higher the damages are for one event, the more skewed the projected losses are. The emphasis here is to say that risks cannot be diminished just because one county has not had a large scale damaging tornado or severe storm.

Once this calculation has been made for all tracts in a county, the results can be totaled to develop an estimate at the county level. The following figure provides the result of this analysis for counties within the State.

Tornado Loss Estimates by County

County	Number of Tornadoes 1951-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Adams	31	$3,762,010	$121,355.16	50.0%	$60,677.58
Alexander	19	$1,478,350	$77,807.89	30.6%	$23,844.35
Bond	19	$50,450,000	$2,655,263.16	30.6%	$813,709.68
Boone	8	$2,352,500	$294,062.50	12.9%	$37,943.55
Brown	8	$2,820,000	$352,500.00	12.9%	$45,483.87
Bureau	41	$4,974,700	$121,334.15	66.1%	$80,237.10
Calhoun	10	$425,030	$ 42,503.00	16.1%	$6,855.32
Carroll	17	$2,567,750	$151,044.12	27.4%	$41,415.32
Cass	7	$2,025,000	$289,285.71	11.3%	$32,661.29
Champaign	63	$42,023,300	$667,036.51	101.6%	$677,795.16
Christian	33	$1,872,750	$56,750.00	53.2%	$30,205.65
Clark	9	$405,300	$45,033.33	14.5%	$6,537.10
Clay	16	$3,280,000	$205,000.00	25.8%	$52,903.23
Clinton	18	$30,825,000	$1,712,500.00	29.0%	$497,177.42
Coles	30	$19,932,500	$664,416.67	48.4%	$321,491.94
Cook	54	$120,665,500	$2,234,546.30	87.1%	$1,946,217.74
Crawford	17	$1,605,000	$94,411.76	27.4%	$25,887.10
Cumberland	12	$332,500	$27,708.33	19.4%	$5,362.90
DeKalb	14	$325,000	$23,214.29	22.6%	$5,241.94
DeWitt	22	$14,908,000	$677,636.36	35.5%	$240,451.61
Douglas	24	$5,830,500	$242,937.50	38.7%	$94,040.32
DuPage	27	$12,412,500	$459,722.22	43.5%	$200,201.61
Edgar	28	$662,560	$23,662.86	45.2%	$10,686.45
Edwards	7	$5,330,000	$761,428.57	11.3%	$ 85,967.74

County	Number of Tornadoes 1951-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Effingham	17	$1,607,560	$94,562.35	27.4%	$25,928.39
Fayette	19	$3,745,250	$197,118.42	30.6%	$60,407.26
Ford	29	$6,374,500	$219,810.34	46.8%	$102,814.52
Franklin	20	$5,867,000	$293,350.00	32.3%	$94,629.03
Fulton	34	$39,219,000	$1,153,500.00	54.8%	$632,564.52
Gallatin	10	$1,322,530	$132,253.00	16.1%	$21,331.13
Greene	17	$3,398,900	$199,935.29	27.4%	$54,820.97
Grundy	13	$26,078,500	$2,006,038.46	21.0%	$420,620.97
Hamilton	12	$9,000,000	$750,000.00	19.4%	$145,161.29
Hancock	32	$34,562,530	$1,080,079.06	51.6%	$557,460.16
Hardin	3	$25,030	$8,343.33	4.8%	$ 403.71
Henderson	15	$8,340,090	$556,006.00	24.2%	$134,517.58
Henry	49	$32,077,650	$654,645.92	79.0%	$517,381.45
Iroquois	41	$9,385,750	$228,920.73	66.1%	$151,383.06
Jackson	35	$4,771,500	$136,328.57	56.5%	$76,959.68
Jasper	13	$642,500	$49,423.08	21.0%	$10,362.90
Jefferson	27	$12,966,000	$480,222.22	43.5%	$209,129.03
Jersey	13	$5,577,500	$429,038.46	21.0%	$89,959.68
Jo Daviess	9	$525,250	$58,361.11	14.5%	$8,471.77
Johnson	18	$3,900,000	$216,666.67	29.0%	$62,903.23
Kane	23	$6,225,000	$270,652.17	37.1%	$100,403.23
Kankakee	35	$35,470,250	$1,013,435.71	56.5%	$572,100.81
Kendall	14	$5,325,000	$380,357.14	22.6%	$85,887.10
Knox	23	$7,127,000	$309,869.57	37.1%	$114,951.61
Lake	16	$14,702,500	$918,906.25	0.3%	$2,466.03
LaSalle	43	$8,892,780	$206,808.84	69.4%	$143,431.94

County	Number of Tornadoes 1951-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Lawrence	8	$3,405,000	$425,625.00	12.9%	$54,919.35
Lee	24	$983,000	$40,958.33	38.7%	$15,854.84
Livingston	40	$10,194,750	$254,868.75	64.5%	$164,431.45
Logan	59	$41,581,750	$704,775.42	95.2%	$670,673.39
Macon	55	$26,604,750	$483,722.73	88.7%	$429,108.87
Macoupin	32	$1,127,750	$35,242.19	51.6%	$18,189.52
Madison	53	$65,290,000	$1,231,886.79	85.5%	$1,053,064.52
Marion	25	$7,635,030	$305,401.20	40.3%	$123,145.65
Marshall	9	$2,817,500	$313,055.56	14.5%	$45,443.55
Mason	31	$6,180,250	$199,362.90	50.0%	$99,681.45
Massac	18	$11,290,000	$627,222.22	29.0%	$182,096.77
McDonough	30	$1,728,000	$57,600.00	48.4%	$27,870.97
McHenry	16	$30,327,500	$1,895,468.75	25.8%	$489,153.23
McLean	103	$22,496,370	$218,411.36	166.1%	$362,844.68
Menard	8	$12,460,000	$1,557,500.00	12.9%	$204,262.30
Mercer	34	$5,240,000	$154,117.65	54.8%	$84,516.13
Monroe	28	$2,038,030	$72,786.79	45.2%	$32,871.45
Montgomery	32	$1,960,700	$61,271.88	51.6%	$31,624.19
Morgan	27	$6,010,500	$222,611.11	43.5%	$96,943.55
Moultrie	7	$150,000	$21,428.57	11.3%	$2,419.35
Ogle	21	$3,575,000	$170,238.10	33.9%	$57,661.29
Peoria	20	$90,885,000	$4,544,250.00	32.3%	$1,465,887.10
Perry	18	$3,326,500	$184,805.56	29.0%	$53,653.23
Piatt	27	$7,107,500	$263,240.74	43.5%	$114,637.10
Pike	27	$3,255,030	$120,556.67	43.5%	$52,500.48
Pope	14	$4,400,500	$314,321.43	22.6%	$70,975.81

County	Number of Tornadoes 1951-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Pulaski	14	3,990,000	$285,000.00	22.6%	$64,354.84
Putnam	9	8,402,500	$933,611.11	14.5%	$135,524.19
Randolph	37	6,762,000	$182,756.76	59.7%	$109,064.52
Richland	10	5,575,000	$557,500.00	16.1%	$89,919.35
Rock Island	19	10,767,500	$566,710.53	30.6%	$173,669.35
Saline	15	6,275,280	$418,352.00	24.2%	$101,214.19
Sangamon	72	24,346,750	$338,149.31	116.1%	$392,689.52
Schuyler	17	2,837,780	$166,928.24	27.4%	$45,770.65
Scott	13	937,000	$72,076.92	21.0%	$15,112.90
Shelby	26	7,520,250	$289,240.38	41.9%	$121,294.35
St. Clair	38	15,962,500	$420,065.79	61.3%	$257,459.68
Stark	10	2,552,500	$255,250.00	16.1%	$41,169.35
Stephenson	21	2,973,000	$141,571.43	33.9%	$47,951.61
Tazewell	51	26,917,500	$527,794.12	82.3%	$34,153.23
Union	18	5,962,500	$331,250.00	29.0%	$96,169.35
Vermilion	48	34,615,780	$721,162.08	77.4%	$558,319.03
Wabash	17	32,989,000	$1,940,529.41	27.4%	$532,080.65
Warren	24	623,950	$25,997.92	38.7%	$10,063.71
Washington	26	1,050,000	$40,384.62	41.9%	$16,935.48
Wayne	24	10,755,000	$448,125.00	38.7%	$173,467.74
White	18	6,402,500	$355,694.44	29.0%	$103,266.13
Whiteside	32	5,607,500	$175,234.38	51.6%	$90,443.55
Will	65	346,512,060	$5,330,954.77	104.8%	$5,588,904.19
Williamson	16	278,000,000	$17,375,000.00	25.8%	$4,483,870.97
Winnebago	13	5,440,000	$418,461.54	21.0%	$87,741.94
Woodford	39	913,275	$23,417.31	62.9%	$14,730.24

Severe Storm Loss Estimates by County										
County		**Number of Severe Storms 1950-2012 (NCDC)**		**Total Recorded Loss (NCDC)**		**Average $ in property damage per event (NCDC)**		**Annual Probability of Event**		**Estimated Annual Loss**
Adams		363		$140,515		$387.09		585.5%		$2,266.37
Alexander		114		$1,111,000		$9,745.61		183.9%		$17,919.35
Bond		145		$124,200		$856.55		233.9%		$2,003.23
Boone		122		$544,500		$4,463.11		196.8%		$8,782.26
Brown		85		$6,000		$70.59		137.1%		$96.77
Bureau		249		$4,502,502		$18,082.34		401.6%		$72,621.00
Calhoun		86		$27,100		$315.12		138.7%		$437.10
Carroll		211		$2,707,000		$12,829.38		340.3%		$43,661.29
Cass		118		$4,110,800		$34,837.29		190.3%		$66,303.23
Champaign		338		$5,545,000		$16,405.33		545.2%		$89,435.48
Christian		190		$832,000		$4,378.95		306.5%		$13,419.35
Clark		126		$158,808		$1,260.38		203.2%		$2,561.42
Clay		171		$1,456,900		$8,519.88		275.8%		$23,498.39
Clinton		266		$345,638		$1,299.39		429.0%		$5,574.81
Coles		207		$1,367,508		$6,606.32		333.9%		$22,056.58
Cook		1130		$40,428,600		$35,777.52		1822.6%		$652,074.19
Crawford		147		$1,636,600		$11,133.33		237.1%		$26,396.77
Cumberland		79		$365,200		$4,622.78		127.4%		$5,890.32
DeKalb		218		$652,000		$2,990.83		351.6%		$10,516.13
DeWitt		131		$1,388,000		$10,595.42		211.3%		$22,387.10
Douglas		112		$1,075,000		$9,598.21		180.6%		$17,338.71
DuPage		444		$6,949,001		$15,650.90		716.1%		$112,080.66
Edgar		143		$1,044,000		$7,300.70		230.6%		$16,838.71
Edwards		78		$2,533,000		$32,474.36		125.8%		$40,854.84

County	Number of Severe Storms 1950-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Effingham	167	$647,600	$3,877.84	269.4%	$10,445.16
Fayette	178	$1,621,000	$9,106.74	287.1%	$26,145.16
Ford	110	$1,226,000	$11,145.45	177.4%	$19,774.19
Franklin	207	$9,071,000	$43,821.26	333.9%	$146,306.45
Fulton	310	$2,034,600	$6,563.23	500.0%	$32,816.13
Gallatin	73	$3,155,500	$43,226.03	117.7%	$50,895.16
Greene	131	$1,064,000	$8,122.14	211.3%	$17,161.29
Grundy	187	$6,245,500	$33,398.40	301.6%	$100,733.87
Hamilton	77	$1,188,050	$15,429.22	124.2%	$19,162.10
Hancock	235	$5,267,750	$22,415.96	379.0%	$84,963.71
Hardin	40	$319,000	$7,975.00	64.5%	$5,145.16
Henderson	110	$10,765,025	$97,863.86	177.4%	$173,629.44
Henry	312	$52,724,500	$168,988.78	503.2%	$850,395.16
Iroquois	200	$1,757,060	$8,785.30	322.6%	$28,339.68
Jackson	272	$104,646,500	$384,729.78	438.7%	$1,687,846.77
Jasper	123	$1,753,500	$14,256.10	198.4%	$28,282.26
Jefferson	180	$14,364,400	$79,802.22	290.3%	$231,683.87
Jersey	166	$153,000	$921.69	267.7%	$2,467.74
Jo Daviess	209	$1,833,700	$8,773.68	337.1%	$29,575.81
Johnson	152	$8,087,000	$53,203.95	245.2%	$130,435.48
Kane	382	$1,620,800	$4,242.93	616.1%	$26,141.94
Kankakee	247	$4,664,000	$18,882.59	398.4%	$75,225.81
Kendall	145	$276,500	$1,906.90	233.9%	$4,459.68
Knox	188	$2,859,550	$15,210.37	303.2%	$46,121.77
Lake	384	$553,000	$1,440.10	6.4%	$92.75
LaSalle	278	$7,879,000	$28,341.73	448.4%	$127,080.65

County	Number of Severe Storms 1950-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Lawrence	152	$727,000	$4,782.89	245.2%	$11,725.81
Lee	200	$186,500	$932.50	322.6%	$3,008.06
Livingston	187	$284,500	$1,521.39	301.6%	$4,588.71
Logan	265	$17,087,500	$64,481.13	427.4%	$275,604.84
Macon	252	$3,355,000	$13,313.49	406.5%	$54,112.90
Macoupin	345	$6,065,500	$17,581.16	556.5%	$97,830.65
Madison	522	$2,353,800	$4,509.20	841.9%	$37,964.52
Marion	231	$1,199,200	$5,191.34	372.6%	$19,341.94
Marshall	139	$2,014,000	$14,489.21	224.2%	$32,483.87
Mason	39	$789,550	$20,244.87	62.9%	$12,734.68
Massac	136	$1,690,550	$12,430.51	219.4%	$27,266.94
McDonough	300	$1,073,550	$3,578.50	483.9%	$17,315.32
McHenry	305	$1,443,500	$4,732.79	491.9%	$23,282.26
McLean	338	$7,444,000	$22,023.67	545.2%	$120,064.52
Menard	161	$666,000	$4,136.65	259.7%	$0.00
Mercer	166	$13,553,600	$81,648.19	267.7%	$218,606.45
Monroe	173	$1,193,100	$6,896.53	279.0%	$19,243.55
Montgomery	255	$105,900	$415.29	411.3%	$1,708.06
Morgan	205	$1,803,500	$8,797.56	330.6%	$29,088.71
Moultrie	83	$8,289,200	$99,869.88	133.9%	$133,696.77
Ogle	228	$928,000	$4,070.18	367.7%	$14,967.74
Peoria	333	$3,562,200	$10,697.30	537.1%	$57,454.84
Perry	160	$3,228,200	$20,176.25	258.1%	$52,067.74
Piatt	113	$1,979,000	$17,513.27	182.3%	$31,919.35
Pike	201	$136,200	$677.61	324.2%	$2,196.77
Pope	80	$670,000	$8,375.00	129.0%	$10,806.45

County	Number of Severe Storms 1950-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Pulaski	99	$604,000	$6,101.01	159.7%	$9,741.94
Putnam	85	$4,719,020	$55,517.88	137.1%	$76,113.23
Randolph	284	$184,300	$648.94	458.1%	$2,972.58
Richland	105	$637,150	$6,068.10	169.4%	$10,276.61
Rock Island	326	$1,931,200	$5,923.93	525.8%	$31,148.39
Saline	168	$7,351,000	$43,755.95	271.0%	$118,564.52
Sangamon	401	$13,512,500	$33,697.01	646.8%	$217,943.55
Schuyler	107	$2,230,850	$20,849.07	172.6%	$35,981.45
Scott	91	$499,100	$5,484.62	146.8%	$8,050.00
Shelby	147	$9,047,500	$61,547.62	237.1%	$145,927.42
St. Clair	594	$603,973	$1,016.79	958.1%	$9,741.50
Stark	89	$119,000	$1,337.08	143.5%	$1,919.35
Stephenson	276	$5,090,000	$18,442.03	445.2%	$82,096.77
Tazewell	339	$4,523,250	$13,342.92	546.8%	$72,955.65
Union	119	$1,582,000	$13,294.12	191.9%	$25,516.13
Vermilion	290	$16,040,200	$55,311.03	467.7%	$258,712.90
Wabash	122	$1,226,500	$10,053.28	196.8%	$19,782.26
Warren	156	$3,479,250	$22,302.88	251.6%	$56,116.94
Washington	213	$1,251,500	$5,875.59	343.5%	$20,185.48
Wayne	136	$3,634,000	$26,720.59	219.4%	$58,612.90
White	135	$3,169,500	$23,477.78	217.7%	$51,120.97
Whiteside	312	$1,042,310	$3,340.74	503.2%	$16,811.45
Will	537	$3,493,000	$6,504.66	866.1%	$56,338.71
Williamson	175	$278,000,000	$1,588,571.43	282.3%	$4,483,870.97
Winnebago	325	$5,963,500	$18,349.23	524.2%	$96,185.48
Woodford	210	$1,629,000	$7,757.14	338.7%	$26,274.19

D. Floods

Description

Except for fire, the most common hazard in the United States is flooding with thousands occurring each year. Flooding occurs along the coast, rivers, lakes, small streams, gullies, creeks, and in typically dry streambeds. Sheet flow can occur when the land is saturated or impervious. Ponding can occur in low lying ground. Street flooding and basement flooding are often associated with overwhelmed stormwater systems. The standard definition of a flood is "A general and temporary condition of partial or complete inundation of normally dry land areas from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land". A simpler definition is too much water in the wrong place. Since water circulates from clouds to the soil to streams to rivers to the oceans and returns to the clouds, a scientific definition of a flood is an imbalance in the "hydrological system" with more water flowing through the system than the system can draw off.

Floods are not all alike:

- Riverine Floods: Develop slowly, sometimes over a period of days or weeks.
- Flash Floods: Develop quickly, sometimes in just a few minutes. Usually flash floods are the result of intense storms dropping large amounts of rain within a brief period.
- Overland Floods: Occurs outside a defined river or stream (e.g. sheet flow or ponding in a low lying area)
- Aquifer Flood: Water is expelled from a subterranean geologic formation to the surface causing flooding in the immediate area.
- Subterranean Flood: Water floods into tunnels that are normally dry.

Snow melt filling rivers too quickly, heavy rainfall associated with slow-moving, low-pressure or frontal storm systems or storm surge create excess water. This water accumulates and overflows onto adjacent lands not normally covered by water. These floods can occur any time of the year, any time of the day or night and in any part of the country. Flooding can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states. The severity of floods is determined by the amount of rainfall or other water source, duration, topography, ground cover, frozen soil, wet or saturated soil that can't hold any more water, full reservoirs, high river or stream levels, ice-covered rivers or urbanization (lots of buildings, parking lots and roads). The majority of scientists believe that global warming causes extremes in weather that have increased flooding. Human activity influences the frequency and severity of floods.

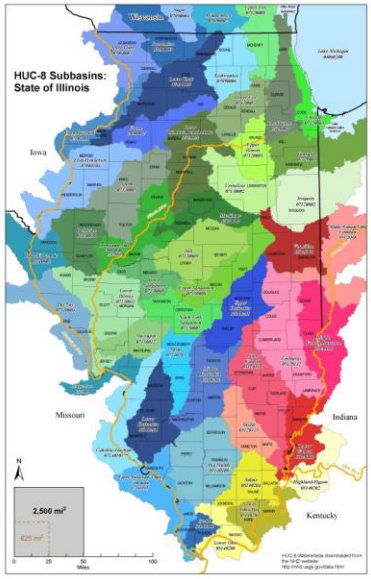
An aquifer is a subterranean geologic formation composed of permeable layers of rock or sand that hold or transmit groundwater. Aquifer flooding is most often found in areas that have what is termed an "Unconfined Aquifer" underneath them. An unconfined aquifer is an aquifer that is close to the ground surface, with continuous layers of materials of high intrinsic permeability extending from the land surface to the base of the aquifer. Water is fed into the aquifer through a process called "Recharge". Recharge takes place when water seeps downward through the soil layer called the unsaturated zone into the aquifer. Recharge can also occur through lateral ground water flow, or upward seepage from underlying strata. The water in the aquifer is always under pressure. This is normally not a problem, as the amount of water expelled from the aquifer by natural methods is equal to the amount entering the aquifer. If for any reason the amount of water entering the aquifer is greater than the amount expelled (for example seepage into the aquifer from unusually heavy rain causes the amount of water in the aquifer to rise dramatically faster than the water can be naturally expelled) the water in the aquifer, which is already under increased pressure, is placed under even greater pressure until the

pressure is greater than the rock and sand of the aquifer can withstand and the water breaks out of the aquifer and rises to the surface where it causes surface flooding in the immediate area. An important thing to remember about aquifer flooding is that the area affected by the flooding may not have any history of flooding and may not even be located near any significant body of water. The only way to be certain that a locality is not susceptible to aquifer flooding is to undertake a systematic geologic study of the area. In Illinois, Mason County has a history of aquifer flooding. The aquifer was mapped by the State Water Survey using HMGP funds following floods in 1994.

Subterranean flooding occurs mainly in urban centers that are adjacent to significant bodies of water (i.e. rivers, lakes, and streams) or in urban centers situated in areas with high water tables. Subterranean flooding occurs when a normally dry tunnel running underneath an urban center such as a train tunnel, is breached. Some examples of a subterranean breach would be malicious action, internal tunnel damage as a result of train derailment, external tunnel damage as a result of sinking vessels, dredging or dropped objects, water main malfunction or structural failure of the tunnel itself. Once the tunnel is breached water from nearby bodies of water flows into the void. The weight of the water flooding the tunnel can cause extreme pressure on the foundations of nearby buildings, placing those buildings in danger of structural collapse, thus endangering lives and property.

Basement flooding causes significant damage in some urban areas, most commonly in older communities. The damage is exacerbated where there are combined stormwater and sanitary sewers. When the capacity of storm sewers and waterways is exceed water backs up into streets, yards and basements.

Watersheds are an important component in understanding the accumulation and pathway of surface water. A watershed is an area of land that drains into a lake, stream or other body of water. The next page has a map complied by the ISWS showing the watersheds identified by the US Geological Survey as Hydrologic Unit Code 8 (HUC8). Geographically smaller watersheds are coded as HUC10, and HUC12. Within the watershed, smaller channels or tributaries collect runoff from rain and snowmelt and convey the water to larger channels and eventually to the main channel which is the lowest body of water in the watershed. A flood, a natural occurrence, happens when the channel capacity is exceeded and water overflows the banks onto the adjacent land (floodplain). The land and the condition of the land affect the rate and quantity of water:



1. If the terrain is steep water will more rapidly run off the land into streams.
2. If the ground is already saturated from previous rains, during subsequent precipitation events water will run off the land into streams rather than being intercepted or stored and flooding is more likely.
3. If the depression storage areas are already inundated, flooding is more likely If a significant part of the land area of the watershed has been covered with pavement and other impervious areas, more water will reach the streams and flooding is more likely. Urban watersheds will flood more quickly than rural watersheds because in the country the water can soak into the ground instead of running quickly into the streams and rivers.

Flood damage is often exacerbated by snow melt and spring rains which create excessive stormwater run-off. The paving over of permeable soils and the fact that most stormwater drainage systems are only designed for 10-year storm events increase both rural and urban run-off problems. As with all natural disasters, it is the presence of humans which creates the problem. In the specific case of floods, the floodplain is a clear visual symbol which tells us that, by nature, a river periodically overflows its banks and that we should expect it. Development of the floodplain without any heed to the flood threat is irrational and costly in both economic and ecological terms. The acquisition/relocation program following the Great Mississippi River Flood of 1993 is a mitigation measure that begins to correct the construction/destruction/reconstruction phenomenon caused by unwise floodplain development and remains the priority program for the State of Illinois with which to permanently reduce the effects of riverine flooding.

Historical Data

According to the Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR), Illinois has one of the largest inland systems of rivers, lakes and streams in the United States. Nearly 15% of our total land area (or 7,400 square miles) is subject to flooding. Floods are an inevitable natural event. Floods are by far the most common natural disaster in Illinois, accounting for well over 90% of the declared disasters. It is estimated that over 250,000 buildings are located in floodplains of Illinois.

Since 1965 all but one county in Illinois had been declared at least once by the President as major disaster areas due to flooding. FEMA 4116-DR in 2013 resulted in the sole remaining county becoming declared. Three counties (Cass, St. Clair and Monroe) have been declared in each of the four years from 1993 to 1996. Ten counties were declared in both the 1993 and 1995 floods. Calhoun County, less than ten miles wide and approximately 42 miles from north to south and located between the Mississippi and Illinois rivers, and Cass County which has the Illinois River as its western boundary has had seventeen major flood declarations since 1965.

Most of the counties in recent declarations have an extensive history of repetitive flooding. In March 1979, the Illinois River flooded 29 counties (FEMA 583-DR). In June 1981, heavy rains produced flooding in the Chicago suburbs of south Cook County and Will, Schuyler and Carroll counties (FEMA 643-DR). In February and March of 1982, the Kankakee and Illinois rivers flooded, with Kankakee and Will counties receiving State declarations; however, Federal assistance was not requested. In December, the Illinois River flooded again, and 26 counties received Federal declarations for flooding and one county (Clinton) received a declaration for a tornado (FEMA 674-DR). In June of 1983, the Mississippi River caused flooding from its confluence with the Illinois River south to its juncture with the Ohio River at Cairo, Illinois, and 13 counties received Federal declarations (FEMA 684-DR). In July 1983, flooding occurred in four northern counties for which State declarations were proclaimed. Federal assistance was not requested. Then in February of 1985 flooding again occurred on the Kankakee, Wabash and Illinois rivers, and 28 counties received Federal declarations (FEMA 735-DR). Within an eleven-month period (October, 1986 to August, 1987), the Chicago-metro area experienced two major storms that created flash and overland flooding, FEMA 776-DR and 798-DR. In FEMA 776-DR, Cook, Lake, McHenry and Kane counties were declared along with four counties along the Mississippi River (Adams, Calhoun, Jersey and St. Clair counties). In FEMA 798-DR, only Cook and DuPage counties were declared.

Flooding occurred again in May and June, 1990, when 30 counties received Federal declarations (FEMA 871-DR). A structural failure resulted in underground flooding of the Chicago Loop area in 1992 (FEMA 941-DR).

The Great Flood of 1993 (FEMA 997-DR) did the most damage along the Mississippi River in the recorded history of Illinois. Following a wet winter, continuous and persistently heavy rain fell on most of the Upper Midwest throughout spring and into the summer causing major flooding in nine states. Flood waters began rising in March of 1993 and did not recede until September of that year. Prior to the Presidential declaration of this major disaster on July 9, 1993, the State had activated the Emergency Operations Center four times as a result of scattered flooding and Gubernatorial Proclamations.

Northwest and west-central Illinois (the latter located between the Mississippi and Illinois rivers) were particularly hard-hit. Between July 9 and August 27, 1993, thirty-nine (39) counties in Illinois were declared Federal Disaster Areas as many levees failed along the Mississippi and Illinois rivers. The Great Flood of 1993 brought an increased interest and new attitudes about mitigation. The failure of costly structural flood control methods changed the emphasis from trying to protect properties located in harm's way to moving people and property from harm's way. Flooding was recognized as a natural process and the wisdom of fighting nature was questioned.

The Great Flood severely impacted agricultural lands in Illinois. Barge traffic above Cairo, Illinois was halted for over eight weeks due to the record-high water, causing severe economic loss to their operators, but having only negligible effects on the national transportation costs. Some bridges across the Mississippi and the Illinois rivers were impassable, requiring personal and commercial traffic to reroute well out of their way. In Illinois, the Great Flood of 1993 caused 6 deaths, displaced 16,000 people, destroyed or severely damaged 6,000 homes; and caused more than 10,000 jobs to be lost (*The Mississippi Flood of 1993*, ISWS).
Less than one year later, the spring flood of 1994 (FEMA 1025-DR) resulted in a Federal Disaster Declaration for 16 counties across Illinois. Extensive rainfall and groundwater flooding were the culprits in this disaster. Hardest hit were the Central Illinois counties along the Illinois River, but Monroe, St. Clair, Calhoun, and Alexander counties maintained their reputation for flooding. Six eastern Illinois counties were also declared in this disaster. Excess rainfall and groundwater flooding caused Madison and St. Clair counties to be declared again in the spring of 1995, but this was later amended to include 19 more counties, all along the Illinois and Mississippi Rivers (FEMA 1053-DR). In the Spring of 1996 (FEMA 1112-DR), severe flooding Statewide led to a Federal Disaster Declaration for 27 counties mostly in Central and Southern Illinois.

In late July of 1996, the second highest 24-hour rainfall amount in the nation's history was recorded in Northeastern Illinois (FEMA 1129-DR). Seventeen inches fell in southern DuPage and Kane counties with the other nine counties (Cook, DeKalb, Grundy, Kendall, LaSalle, Ogle, Stephenson, Will and Winnebago) ranging from 6 to 12 inches. Although much of the region witnessed record flooding from this severe rainfall event which impacted 11 counties, some of the hardest hit areas in the eleven declared counties were Montgomery in Kane and Kendall counties; Shorewood in Will county; Ottawa in LaSalle County; Kirkland in DeKalb County; and the Valley View Subdivision in DuPage County. Hazard mitigation funds made available (15% of the total FEMA assistance for damages) from this disaster represent nearly two-thirds the amount made available from the 1993 flood. However, unlike the 1993 flood (FEMA 997-DR), there was no State funding match for the FEMA 1129-DR disaster. As

a result, it was difficult to secure interest from counties and communities to sponsor mitigation projects, specifically acquisitions, when no non-Federal match was available. In many instances, counties funded the 25 percent match through Community Development Block Grant (CDBG) funds. Other counties and municipalities agreed to a partial non-Federal contribution, and still others requested that homeowners voluntarily contribute their individual 25 percent, which in essence meant the homeowner was only receiving 75 percent of the pre-flood fair market value on their home.

In late March and early April of 1997, six counties along the Ohio River were declared flood disaster areas (FEMA 1170-DR). Torrential rainfall caused record flooding upstream in some portions of Ohio, Indiana, and Kentucky. Naturally, this excess water caused flooding when the crests moved along Southern Illinois. This was a relatively small disaster in comparison to the major flood events from previous years. Of particular interest in this disaster is the fact that three of the six counties were not participants in the National Flood Insurance Program, making them ineligible to receive any type of mitigation assistance.

On August 16, 1997, torrential rain fell across Northeastern Illinois producing heavy rainfall in a short period. The National Weather Service reported that over four inches fell in less than two hours on the City of Chicago's west side and several suburban communities, causing flash flooding that severely overloaded the storm water drainage system. As much as 6.1 inches was recorded in some areas. With nowhere else to flow, the rainwater and sewage that accumulated in the combined storm water/sanitary sewer system backed up into over 6,000 basements in the City of Chicago and over 1,000 in suburban Cook County (FEMA 1188-DR). Four fatalities were caused by the flash flooding.

In late May 1999, a severe rain storm over Northwestern Illinois resulted in a Presidential Declaration. Through the days of May 16 and 17 this storm exceeded ten inches in East Dubuque and western Jo Daviess County. Flash flooding severely impacted the local government's infrastructure damaging a new storm sewer under construction and destroying two police cars. Residences and businesses alike had to evacuate and damage was severe (FEMA 1278-DR).

On April 18, 2001, flooding began as a result of heavy rains and snow melt in the upper Midwest and continued through the end of the month. On May 9, 2001, the President declared 10 counties a major disaster where near-record flooding occurred on the Mississippi River from the Wisconsin border down to the confluence of the Mississippi and Missouri rivers (FEMA 1368-DR). As mentioned on the previous page, the City of Chicago in August 1997 had torrential rains resulting in a Federal declaration (FEMA 1188-DR) . As a result of this storm, HMGP funds from FEMA paid $9.7 million towards the $13 million project to install inlet control valves in the city's storm water/sewer system. In August of 2001, Chicago was hit by two torrential rainstorms that were equal to or greater than the August 1997 storm. There was no Presidential declaration in 2001 because the damage estimates were only 10% of the 1997 event or $6.7 million. The city also reported much less in overtime costs and debris removal. The impact of these storms clearly illustrated the cost effectiveness of inlet control valves as a mitigation tool.

A series of severe storms began April 21, 2002, and continued through mid-May. These severe storms produced tornadoes, high winds, hail and heavy rains causing flooding. Meanwhile, during the first week of May, Illinois received extraordinary amounts of rain that resulted in both flash and riverine flooding throughout the State. With the ground being saturated from rain for three weeks, flooding occurred in a widespread area. Homes, roads and bridges were damaged. IDOT reported 13

highway closures due to flash flooding including Interstates 55 and 72 near Springfield. May 15th a Gubernatorial Proclamation was issued for all 102 Illinois counties. On May 21, 2002, the President declared a major disaster (FEMA-1416-DR) resulting in 68 Illinois counties being declared. In addition to flooding the following tornadoes occurred: April 21, Wayne County; April 28, Clay, Franklin, Johnson, Pope, Saline, St. Clair and Union counties and May 9, Marion County.

Between May 4 and May 10, 2003, severe weather including tornadoes, damaging winds and flooding affected the extreme southern-tip and a wide area of the mid-western portion of the State (16 counties).

Sunday, July 27, 2003, month long torrential rain resulted in flash flooding causing basements to flood in northern Illinois Will County.

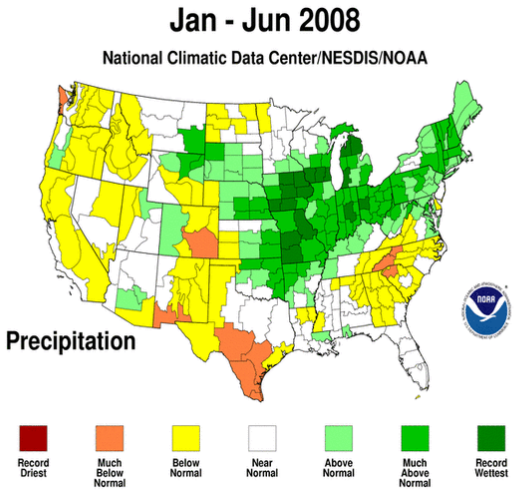
May 2004, continual heavy rains in northeastern Illinois resulted in near or surpass record levels on the Des Plaines and Fox rivers. Lake County and parts of Cook County displaced many people from their homes and forced businesses and schools to close.

December 2004 and January 2005, historic snowfall and continued heavy rains in Southeastern Illinois (9 counties along the Ohio) damaged homes, businesses and roadways.

Monday, September 4, 2007, severe storms moved through Winnebago County and the City of Rockford. Because of flash flooding many residents were forced from their homes, with damage to homes, businesses and infrastructure.

August 20th -31st, 2007 Severe Storms and flooding moved through most of Northeast Illinois removing residents from their homes and affecting businesses and infrastructure in DeKalb, Grundy, Kane, LaSalle, Lake and Will Counties.

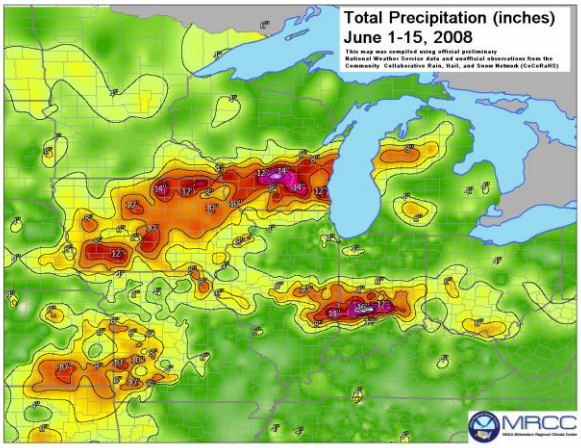
Beginning on January 7th, 2008, Livingston and Iroquois Counties began to receive over 3 inches of rainfall that eventually led to flooding. The ground at the time was still frozen in most areas so the earth could not handle normal saturation. The rain quickly ran off into streams and rivers which then overflowed their banks. Widespread and significant flooding occurred and many areas of the two counties were under water with businesses, schools and homes flooded and damaged.



During March of 2008 the City of Harrisburg experienced extensive flooding in part from interior drainage systems as pumping facilities were not sufficient to discharge accumulated water outside the levee.

After a wet winter and spring, heavy rain fell in June causing moderate to major flooding in much of Illinois. Parts of southern Wisconsin received more than 10 inches of rain which eventually relieved into the Illinois stream network. During the course of the first half of June, 2008, much of the

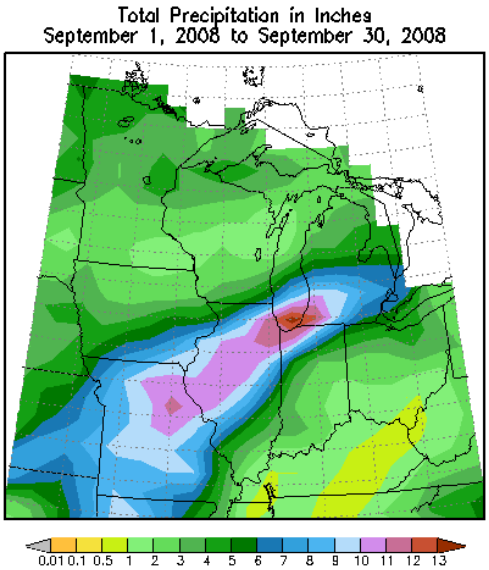
Midwestern U.S. received copious amounts of rainfall as one storm system after another traversed the region. Parts of Indiana, Illinois, Iowa and Wisconsin were recipients of over a foot of rainfall with widespread flooding reported along the Mississippi River and its tributaries. Dams and levees were breached across parts of Wisconsin, Iowa, Indiana and along the Mississippi River. By the end of June, many of the communities along the Mississippi River from Rock Island, IL to Cape Girardeau, MO were still experiencing major flooding. (NCDC) The large-scale weather pattern during the first two weeks of June primarily consisted of a high pressure system over the southern Plains and Ohio Valley and abnormally low pressure situated over the northern Plains. The boundary between these two pressure systems was the focal point for the development of the heavy rainfall and severe storms. (NOAA)



During the month of June, over 1100 daily precipitation records were broken throughout the Midwest. The majority of these records occurred in Iowa, Illinois, Wisconsin and Missouri. For the month, 78 stations reported their wettest day in any June on record and 15 of these stations set a new all-time record for the wettest 24-hour period for any month on record. (NOAA)

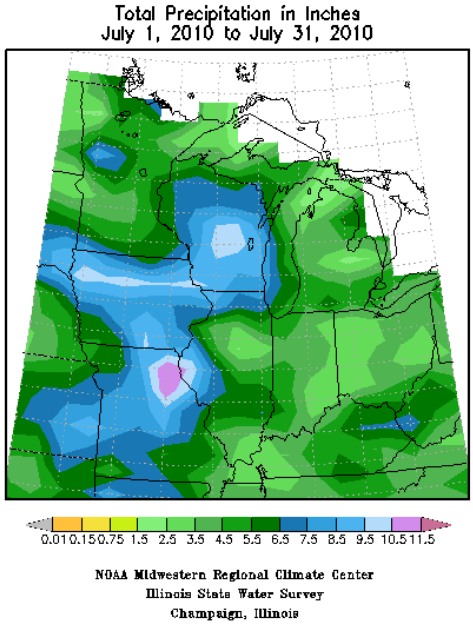
Flooding along the Embarrass and Wabash Rivers was experience in June 2008, due to intense rain events in Indiana and southeastern Illinois on the 2–3, and then again on the 6–7, 2008. Precipitation totals for June 2008 for the entire Wabash River basin varied from 3 to 7 inches in the northern and southern portions of the watershed, while the central portion of the watershed experienced totals from 7 to 17 inches. Hutsonville, IL in Crawford County reported more than 15 inches of rain in June 2008. (*Aftermath of the Floods of June 2008 and Recommendations for Long-term Economic Recovery*, Long Term Recovery Council Final Report, 2009)

Levee breaks on June 10, 2008 flooded portions of Lawrence County near Lawrenceville, inundating a campsite and forcing the evacuations of 200 homes



September 2008 was unfortunately a lot like the month of June. Based on preliminary data from the State Climatologist office, the state-wide average precipitation for September was 7.98 inches, making this the third wettest September on record (going back to 1895) for Illinois. The all-time record is 1926 with 9.71 inches while second place goes to 1911 with 9.06 inches. Starting on September 12th and continuing through September 15th, the system termed "Hurricane Ike" that was once a category 2 storm in the gulf dropped anywhere from 4-10 inches of rainfall over the State. Considerable flooding was the end result, with the northeastern portion of the state receiving the most damage.

July 2010 experienced above normal temperatures and precipitation across Illinois and much of the Midwest. According to the National Weather Service Central Illinois Weather Forecast Office, "Rainfall amounts in extreme northwest Illinois ranged from 13 to 15 inches, which was 11 inches above normal and among the wettest July's on record from Freeport west to Dubuque, Iowa. By contrast a pocket of below normal rainfall by an inch or so occurred from Bloomington-Normal and Champaign-Urbana north to Pontiac and in far southeast Illinois near Paducah. Below are graphics for July 2010 showing total rainfall, departure of normal and percent of normal rainfall across the Midwest and zoomed in on Illinois.

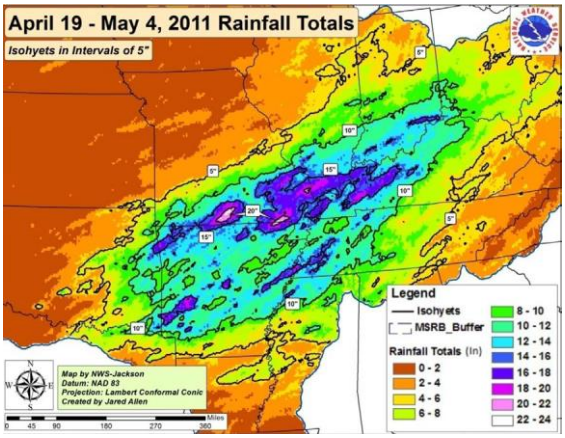


An article published by the Illinois Association of Floodplain and Storm water Management, indicated that, up to 7.02 inches of rain fell in one day and up to 12.10 inches were recorded over two days. Total precipitation records were broken across the affected area, which included Cook, DuPage, Jo Daviess, Stephenson, Winnebago, Carroll, Ogle, Adams, Pike and Schuyler Counties. The majority of rivers in the affected area were reported by the National Weather Service to have been at moderate or major flood stage. Many of the rivers reached record breaking heights and remained above flood stage for periods of up to nine days. The majority of damage was concentrated in in Cook and DuPage Counties, caused by sewer backup in basements. The flooding in northwestern counties washed out several critical roads and bridges, while causing major structural damage to a number of homes and businesses.

"The 2011 Mississippi River Flood broke numerous stage records and produced the highest flows ever recorded along the waterway from Cairo [Illinois] to the Morganza Floodway (below the Morganza Floodway all record flows date to before floodway construction). River stages and flow rates were comparable to the major floods of 1927 and 1937. Well above-average precipitation fell throughout the Mississippi, Missouri, and Ohio River Valleys from January through early May. Several areas across the Mississippi Valley reached flood stage beginning in late February. In April, two major storm systems deposited record levels of rainfall on the Mississippi River watershed. That rainfall combined with the springtime snowmelt resulted in the river and many of its tributaries swelling to record levels by the beginning of May.

The primary meteorological factors that led to the historic Mississippi River Flood of 2011 included above-normal snowfall over the Upper Mississippi Valley, elevated river levels from heavy rain events from February to April, and a very heavy rain event the end of April/beginning of May. Heavy snow in December 2010/early January 2011 and again at the end of February/beginning of March led to 150 to 300 percent of normal SWE (snow water equivalents) on the ground over Minnesota and Wisconsin. Cold temperatures delayed the melting process until the third week of March, which allowed for the crest from the snow to reach the confluence of the Mississippi and Ohio Rivers at the end of April.

Heavy rains that fell over the Ohio and Middle Mississippi Valleys between the end of February and the middle of March produced the 14th highest historical stage at Cairo on March 18. The river fell through the end of April, but rain occurred once again at the beginning of April producing river stages of 9 feet above flood stage at Cairo by the middle of April. At that time, very heavy rains began and lasted from the middle of April through the beginning of May over the watershed from Arkansas City to Chester and over the Lower Ohio Valley.

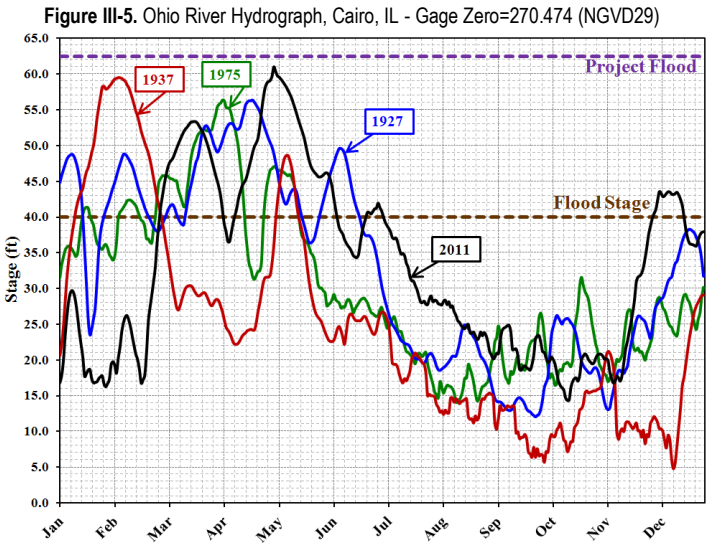


Two week totals from April 19 to May14 of 8 to16 inches of rain occurred over the Mississippi watershed from Arkansas City to Caruthersville and amounts of 12 to 22 inches occurred over the watershed from Caruthersville to Chester and over the Lower Ohio Valley. These amounts were 600 to 1000 percent of normal rainfall for that time period. With the addition of the water from 150 to 300 percent of normal snow water equivalents over Minnesota and Wisconsin which melted and reached the confluence of the Mississippi and Ohio Rivers in conjunction with the very heavy rains and already elevated river levels, river stages exceeded record levels at the confluence of the Mississippi and Ohio Rivers on April 29 and at downstream locations as the flood progressed."

"Mississippi River to the north of St Louis also began its initial break-up at this time causing some ice jam flooding. Due to the snow melt and ice break-up, minor flooding was experienced along the mainstream Mississippi River from Grafton to Hannibal during the third week of February and minor to moderate flooding was occurring over many tributaries in Iowa, Missouri, and Illinois.

During March "minor to moderate flooding continued on the mainstream Mississippi from Osceola to Grafton; along the Illinois River downstream from Starved Rock; along the Ohio River downstream from McAlpine L&D."

Figure III-5. Ohio River Hydrograph, Cairo, IL - Gage Zero=270.474 (NGVD29)



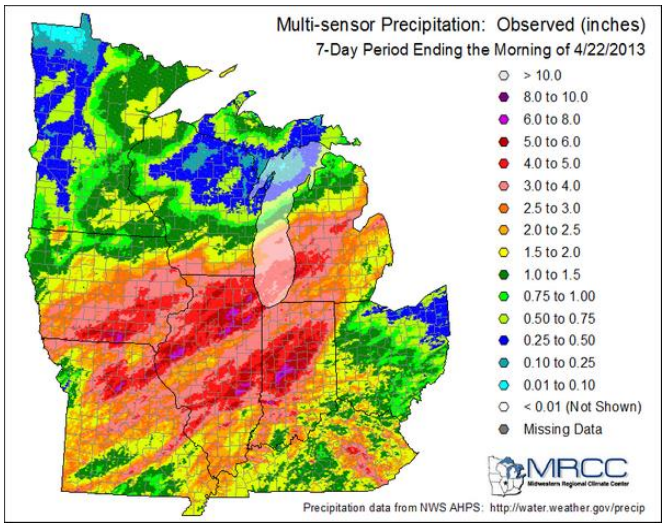
"On April 28, the Mississippi River at St Louis was cresting around 34.1 feet and the Ohio River at Cairo was rising at 58.7 feet with an expected crest of 60.5 feet on May 1. The final round of rain occurred from April 30 to May 2 over the watershed from Greenville to Chester and over the Lower Ohio Valley where 2 to 8 inches fell. Cairo reached 61.0 feet during the morning of May 2 with a forecasted crest of 63.0 feet on May 5."

Activation of the Birds Point New Madrid Floodway reduced flood stages at Cairo and averted overtopping the levee system protecting Cairo, IL. The Birds Point New Madrid Floodway was operated for only the second time in its existence in 2011 on May 2. "Operation lowered the stage at Cairo by 0.5 foot in the

first hour, and lowered the expected crest by 3.5 feet. Maximum flow through the Floodway was 403,000 cfs. Water ceased entering the inflow crevasse June 3, 30 days after operation."

Source: Mississippi River and Tributary 2011 Post Flood Report: Documenting the 2011 Flood, The Corps' Response and the performance of the MR&T System; December 2012, US Army Corps of Engineers (http://www.mvd.usace.army.mil/Missions/FloodRiskManagement/RegionalFloodRiskManagementProgram/MRTPostFloodReport.aspx, access July 11, 2013)

April of 2013 brought excessive rainfall causing widespread flooding across a large part of northern and central Illinois. Areas from the Chicago metro, southwest along the Illinois River Valley, received 5 to 10 inches over a two day period from April 17th to 18th. This caused record flooding along portions of several of Illinois rivers. Federal assistance in Illinois has reached more than **$**144 million, distributed among more than 58,000 individuals and households, since a major disaster was declared for storms and flooding that occurred April 16 through May 5. Federal assistance numbers continue to grow as recovery from this disaster continues at the time of the update.



7-day rainfall totals from around the Midwest.
Image courtesy of the Midwestern Regional Climate Center.

April 2013 Flood Event, Shauna Urlacher, P.E., CFM, Clark Dietz from IAFSM Current, Summer 2013. Daily rainfall records were reported in Peoria, Galesburg and Chicago. Peoria set 24-hour rainfall records on April 17th with 2.47 inches, and on April 18th with 1.37 inches. Galesburg set a daily record of 4.16 inches on April 18th. Chicago reported 3.54 inches on April 18th and a two-day total of 5.55 inches, with some western suburbs reporting two day totals in excess of 7 inches.

Communities along the Chicago River, Fox River, Des Plaines River, DuPage River, Illinois River, and tributaries experienced riverine flooding, and many rivers recorded record flood stages. Heavy rainfall in these watersheds overwhelmed storm and sanitary sewer systems, causing sewer backups and localized flooding throughout the Chicago area. In addition, many communities, including parts of London Mills (Fulton County), Forest View (Cook County), and Marseilles (LaSalle County) experienced significant riverine flooding outside of mapped Special Flood Hazard Areas.

Reports of flooding from this storm vary by community, even within the same watershed. In northeast Illinois, Bolingbrook reported slightly more than a 10-year event, while upstream Lisle experienced rainfall in excess of the 100-year event. Lisle had levees along the East Branch DuPage River and part of St. Joseph Creek overtop for the first time since they were constructed in the late 1960s. The flooding was so severe that the Village had to evacuate over 1,000 living units (apartments, condominiums, and single-family homes) by boat.

The following is a summary of recent Federal flood declarations in Illinois (FEMA number in parentheses):

Feb. 23-Apr. 5, 1985 (FEMA 735-DR)	Severe flooding along the Illinois, Kankakee, and Wabash rivers with over $11 million in damages. This was the seventh flooding of these areas since 1979 (28 counties).
Oct. 7-28, 1986 (FEMA 776-DR)	McHenry, northern Lake, and parts of Cook and Kane counties. counties were flooded by the Fox and Des Plaines river systems. Continuing rains resulted in later flooding by the Mississippi and Illinois rivers (Adams, Calhoun, Jersey and St. Clair counties). Damage exceeded $50 million with 4 deaths attributed to the storm (8 counties).
Aug. 13-14, 1987 (FEMA 798-DR)	All-time record rains over a 15-hour period caused flooding along the Des Plaines River valley and Salt Creek tributary. (Cook and DuPage counties). Private property damages totaled $77.6 million with at least 4 deaths attributed to the flooding (2 counties).
5/1/1990 (FEMA 871-DR)	Reoccurring thunderstorms over southeast Illinois created flooding of the Little Wabash and Skillet Fork rivers (30 counties).
6/1/1990 (FEMA 871-DR)	Similar thunderstorms occurred in Cass and Tazewell counties, producing flash flooding, and $6.4 million in damages which included two tornadoes (included in the above county).
4/13/1992 (FEMA 941-DR)	Underground flooding of the Chicago Freight Tunnel caused by a breach of the wall between the Chicago River and the Tunnel.
March - Sept. 1993 (FEMA 997-DR)	Major flooding along the entire stretch of the Illinois (280 miles) and Mississippi (581 miles) rivers, Northern Illinois, Cook County, and Ohio River counties in Southern Illinois. Record rainfalls and river crests were recorded in 9 states. There were 6 deaths in Illinois and 16,000 displaced. Initial loss estimates totaled more than $15 billion (39 counties).
April & May, 1994 (FEMA 1025-DR)	The heavy rain and groundwater flooding in the spring of 1994 resulted in various counties being declared across the State. FEMA disaster costs estimated to be $17.4 million (16 counties).
May & June, 1995 (FEMA 1053-DR)	Heavy rain and some groundwater flooding along the Illinois and Mississippi rivers. FEMA disaster costs estimated to be $24.6 million (19 counties)

5/1/1996 (FEMA 1112-DR)	Statewide flooding, but most severe in Central and Southeastern Illinois. FEMA disaster costs estimated to be $2.8 million including tornado damage (27 counties).
7/1/1996 (FEMA 1129-DR)	Near-record national rainfall for a 24-hour period in north-eastern Illinois. Worst flooding seen along Fox and Kishwaukee rivers, and Blackberry and Waubansee creeks. FEMA disaster costs estimated to be $136.4 million (11 counties).
March & April, 1997 (FEMA 1170-DR)	Flooding along the Ohio River in southern Illinois. FEMA disaster costs estimated to be $2.4 million (6 counties).
Mid-Sept., 1997 (FEMA 1188-DR)	Between 4" and 6" of rainfall in 2-hour period on Chicago's west and several suburban communities causing flash flooding in (IA only) more than 7,000 basements. Over 20,260 applied for assistance, however, only 11,739 were eligible. FEMA disaster costs estimated to be $63.0 million.
5/1/1999 (FEMA 1278-DR)	Jo Daviess County in northwestern Illinois was declared because a storm system caused serious flash flooding in East Dubuque. Major damage to infrastructure, evacuation of 50 people, and damage to nearly 25 homes and businesses. FEMA disaster costs estimated to be nearly $600,000 (1 county).
4/1/2001 (FEMA 1368-DR)	Major flooding along the Mississippi River in extreme Northern and Central Illinois (10 counties).
4/1/2002 (FEMA 1416-DR)	Severe storms produced tornadoes, high winds, hail, heavy rains and flash flooding. A Gubernatorial Proclamation was issued for all 102 counties because of widespread damage to items such as homes, roads and bridges. Fewer counties received the Federal Declaration (68 counties).
5/1/2003 (FEMA 1469-DR)	Severe weather causing tornadoes, damaging winds and flooding affected the extreme Southern-tip counties and a wide area of the mid-western portion of the State (16 counties).
8/7-8/2007 (FEMA 1722-DR)	Severe weather causing tornadoes, damaging winds and flooding affected the extreme north of Illinois. (2 counties).
8/20-31/2007 (FEMA 1729-DR)	Severe storms and flooding affected the north-eastern counties and portions of the mid-western portion of the State (9 counties).
1/7/2008 (FEMA 1747-DR)	Severe storms and flooding affected the mid-eastern portion of the State. Heavy rains on frozen soil led to a disastrous outcome (2 counties).

6/6-8/2008 (FEMA 1771-DR) Record Severe storms and flooding affected the entire border of the State with the worst damage on the Western portion along the Mississippi. The "Great Flood of 08" affected 7 states during its course. (Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Wisconsin) (25 counties).

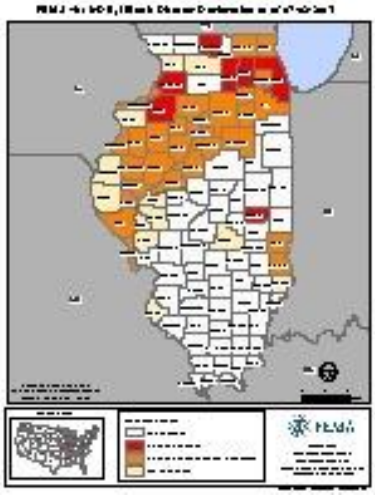
9/13/2008 (FEMA 1800-DR) Severe storms and flooding affected16 counties in the State with the worst damage in the Northeast. Similar storms occurred 1 year previously, but this storm was linked directed to Hurricane Ike.

7/2/09 (FEMA 1850-DR) In May of 2009, an extremely progressive storm moved from Southeastern Kansas, into Southern Missouri and ending up in Southwestern Illinois. Southern Illinois suffered damaging winds of above 80 mph, as well as numerous reports of flash flooding.

7/19/2010 thru 8/7/2010
(FEMA 1935-DR) The second most costly flood disaster occurred during the months of July and August in 2010. Severe storms and flooding affected 8 counties in Illinois. Extreme basement flooding and sewer back up was experienced in Cook and DuPage Counties with major structural damage to homes and businesses in the remaining counties. More than $300 million was approved in assistance grants to individuals and households in Illinois for the severe storms and flooding.

4/19/2011 thru 6/14/2011
(FEMA 1991-DR) Severe Storms and Flooding occurred in Southern Illinois from mid-April and continued into June, 2011. This severe flooding affected 21 counties and resulted in over $29 million dollars in Individual Assistance and Public Assistance combined.

4/16/2013 thru 5/5/2013
(FEMA 4116-DR) Severe Storms, flooding and straight-line winds affected 40 counties in northern and central Illinois. Federal assistance in Illinois has reached more than **$**144 million, distributed among more than 58,000 individuals and households, since a major disaster was declared for storms and flooding that occurred April 16 through May 5.



Federally Declared Flood Disasters by County (January, 1981 – May, 2013)

County:	# of Declared Floods	County:	# of Declared Floods	County:	# of Declared Floods
Calhoun	12	Bureau	5	Williamson	3
Adams	11	Carroll	5	Henry	3
Cook	11	Crawford	5	Kendall	3
Greene	11	DuPage	5	Knox	3
Cass	10	Henderson	5	Livingston	3
Monroe	10	Tazewell	5	McHenry	3
Pike	10	Mercer	5	Putnam	3
Schuyler	10	Kane	5	Shelby	3
Alexander	9	Lake	5	Warren	3
Jersey	9	Lawrence	5	Champaign	2
Hancock	9	Franklin	5	Coles	2
Randolph	8	Hamilton	4	DeWitt	2
St. Clair	8	Jasper	4	Edgar	2
Scott	8	Menard	4	Edwards	2
Mason	8	Saline	4	Effingham	2
Brown	8	Sangamon	4	Ford	2
Jackson	7	Stephenson	4	Jefferson	2
Madison	7	Wabash	4	Macon	2
Pulaski	7	White	4	Montgomery	2
Fulton	7	Clark	4	Piatt	2
Douglas	6	DeKalb	4	Washington	2
LaSalle	6	Marshall	4	Wayne	2
Rock Island	6	McDonough	4	Bond	1
Whiteside	6	Ogle	4	Boone	1
Will	6	Peoria	4	Christian	1
Winnebago	6	Cumberland	3	Clay	1
Woodford	6	Hardin	3	Clinton	1
Union	6	Iroquois	3	Fayette	1
Grundy	6	Macoupin	3	Johnson	1
Gallatin	5	Marion	3	Lee	1
Jo Daviess	5	Moultrie	3	Logan	1
Massac	5	Perry	3	Stark	1
Morgan	5	Richland	3	Kankakee	0
Pope	5	Vermillion	3	McLean	0

Risk Analysis

Flooding is a major, recurring problem in Illinois. Determining total expected dollar losses is extremely hard to estimate in Illinois. In years past, the best source of past damages in dollars was the National Climatic Data Center, which was combined with data from several other areas to give a well-rounded picture of the flood risk. Flood losses recorded in the National Oceanic and Atmospheric Administration's (NOAA) Nation Climatic Data Center (NCDC) database exceeded $5.5 billion in Illinois between 1993 and 2012. Since 1965, flooding was the either the main or a significant contributing factor for 32 out of the 52 Presidential Disaster Declarations declared in Illinois.

The 2013 INHMP utilized Hazard Mitigation Grant Program funds to have a state-wide Level 1.5 HAZUS analysis conducted to develop a risk assessment focused on defining the potential flood exposure throughout the 102 counties in Illinois. This project identified critical and essential facilities located within the 100-year floodplain. A flood vulnerability report for each of the 102 Illinois counties was generated by the Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale. The report reviewed previous occurrences of flooding in the county, identified the FEMA mapped floodplains, summarized the flood-exposure modeling results and identified any critical facilities susceptible to flooding. Sources of uncertainty were associated with the assessment of Illinois Statewide Flooding including; the flood-exposure methods, with the loss estimation, with the social vulnerability parameters, and with the essential and critical facilities data. The results identified in the assessment documented in the INHMP should be interpreted in the context of the methods by which they were generated. A detailed description of the methodology utilized may be located in the complete "Illinois Statewide Flooding Assessment." In Illinois, previous research has shown that building-related loss estimates can average up to 50% greater than loss estimates using individual structure data with assessed values (Remo et al., 2012). Hence, the flood- exposure and -loss values presented here should be viewed as coarse estimates useful for comparative purposes. Due to the nature of these data, it is likely that there were some omissions, misidentifications and some of the facilities identified may not currently be in operation. However, all of the 400 essential and critical facilities identified as at-risk were checked to ensure the facility was located within the floodplain. These facilities were not individually checked for flood-proofing measures. *(Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale)*

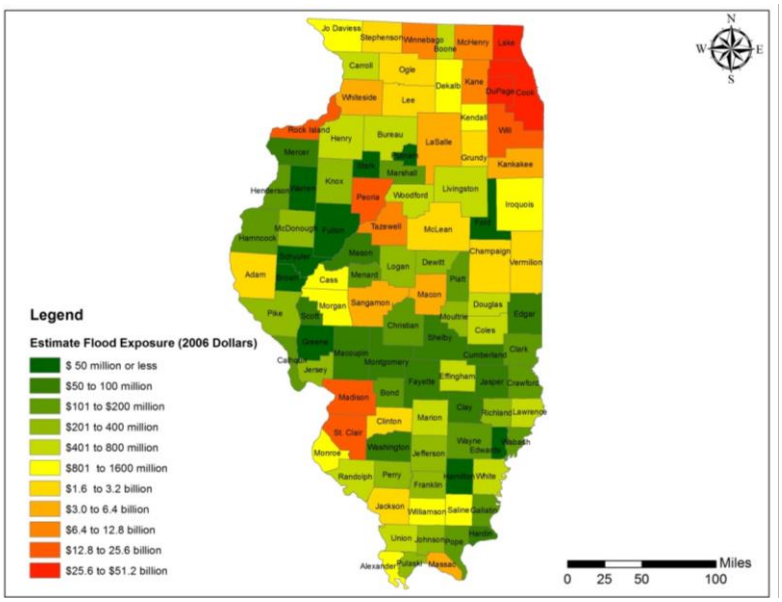


Figure 3 - Estimated flood exposure on 100-year floodplains aggregated by County

The next few pages identify the criteria that were used for this update to quantify damage potentials:

The following diagrams and text are portions taken directly from the "Illinois Statewide Flood Hazard Assessment" completed by Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale:

According to Hazus-MH, the building-related-flood exposure within the 100-year floodplain in Illinois is estimated to be $190.25 billion dollars. The greatest concentration of this flood exposure is located in Cook and adjacent five counties: Dupage, Kane, Lake, McHenry and Will. These counties contain $120.92 billion or nearly 64% of the 100-year flood exposure in Illinois (Figure 3). Correspondingly, the cities within these counties generally had the largest estimate jurisdictional flood exposure.

As identified by Hazus-MH, nine out of the top ten jurisdictions with the largest estimate flood exposure are located within these six counties (Figure 4).

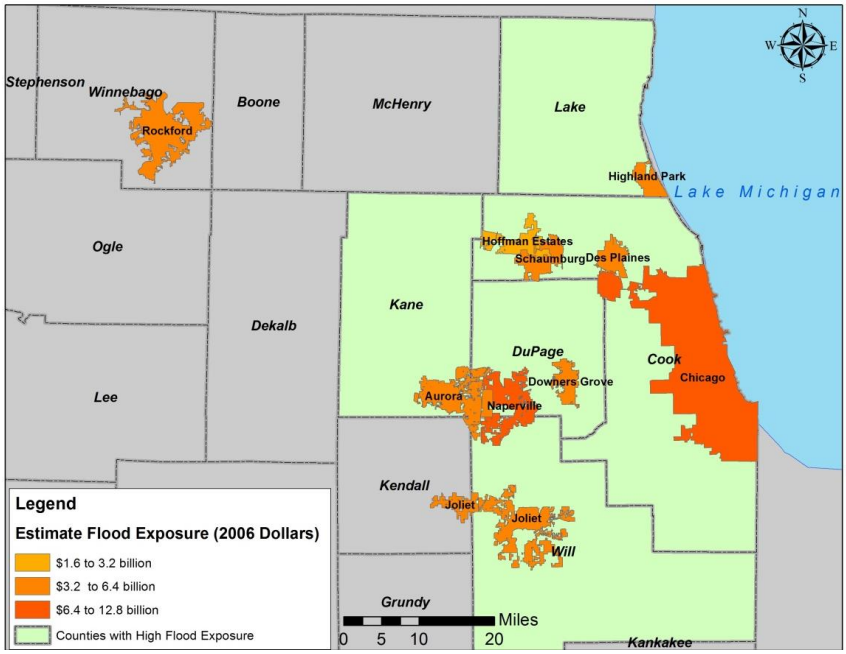


Figure 4 - Top ten jurisdictions in Illinois with highest absolute values of flood exposure on the 100-year floodplains.

According to the Illinois Statewide Flood Hazard Assessment and Hazus-MH, the estimated building-related-flood losses on 100-year Illinois floodplains are $18.03 billion. Aggregated county-level losses ranged from a minimum of $2.39 million in Ford County up to $3.27 billion in Cook County (Figure 6). At the jurisdictional level, flood losses ranged from less than a $1,000 in Bonneville up to $950 million in the City of Chicago. As with the flood exposure estimates, the largest flood losses generally were in and around the City of Chicago.

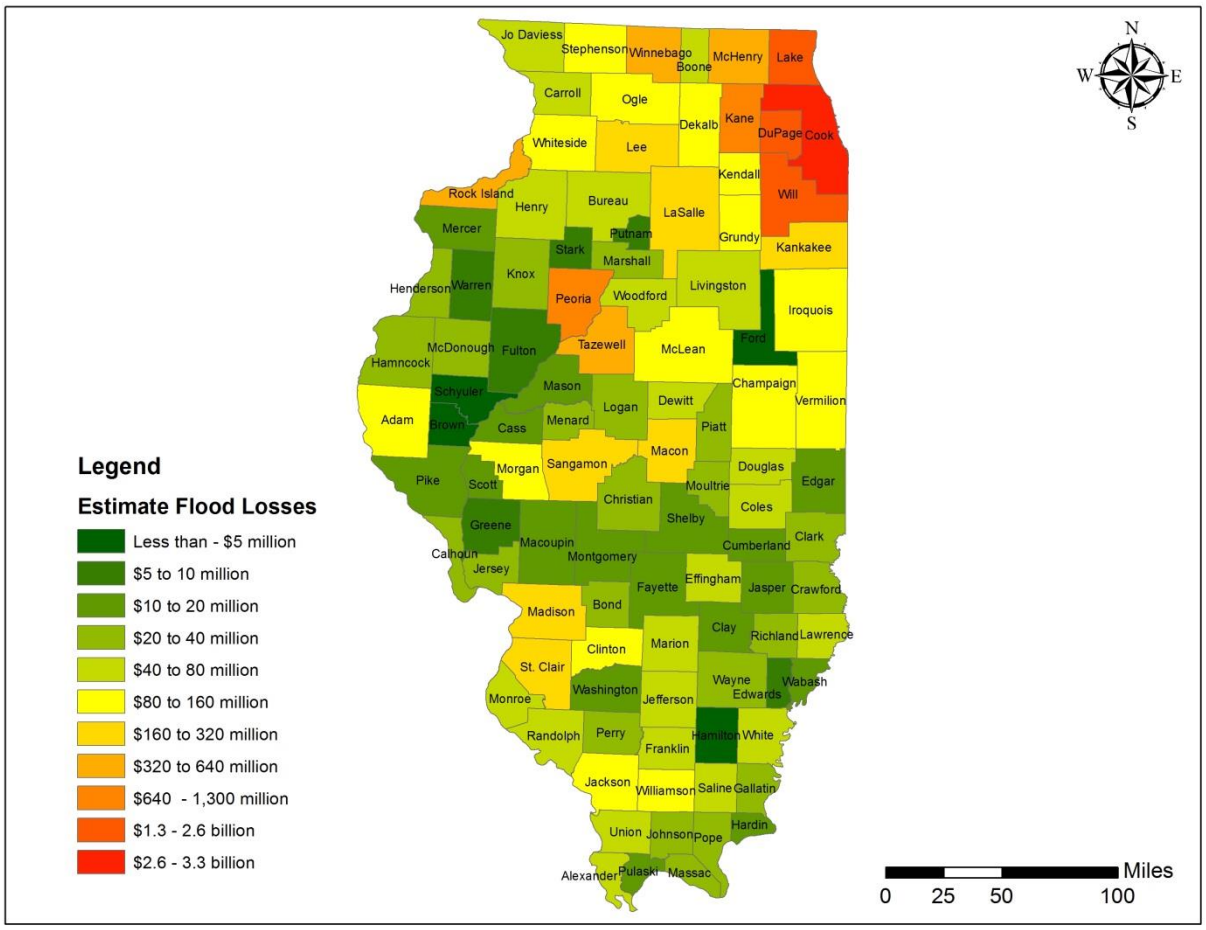


Figure 6- Estimated flood loss on the 100-year floodplain by county.

Flood-loss ratios were calculated in order to normalize losses to total building infrastructure exposure for different jurisdictions. This was done to provide an assessment of the relative impact of flood losses for jurisdictions of different sizes and total quantities of at-risk infrastructure. The average county flood-loss ratio was 0.10, the maximum county flood-loss ratio was 0.3 and the minimum was 0.02 (Figure 7). The flood-loss ratio provides a different perspective on flood risk than flood- exposure and -loss maps. When normalized to total exposure, Cook and surrounding counties have average (0.1) to slightly below average ratios. According to Hazus-MH, the counties with the largest flood-loss ratios are Lee, Peoria, Tazewell, White, and Lawrence Counties (Figure 7). These counties have large expanses of floodplain along larger rivers such as the Rock, Green, Illinois and Wabash. Jurisdictions with higher flood-loss ratios tend to be small and relatively less protected river towns such as Gulfport, Naples, Grand Tower, Old Shawnee town and Liverpool . *Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale*

The flood-loss modeling in this study was performed using Hazus-MH. Hazus-MH is a Geographic Information System- (GIS-) based risk assessment tool designed by FEMA in collaboration with the National Institute of Building Sciences. The Hazus-MH flood module assesses the impact of flooding based on FEMA and USACE damage relationships. These relationships are applied to Hazus-MH

infrastructure inventories or user-defined facilities to estimate losses for a selected flood scenario (Schneider and Schafer, 2006).

Hazus-MH allows modelers either to choose default settings ("Level 1" analysis) or else to provide increasingly detailed user-supplied data to improve the resolution and accuracy of loss estimates ("Level 2" or "Level 3" analyses). For a Level 1 analysis, the demographic and infrastructure inventories provided with the Hazus-MH package are not significantly updated. The Hazus-provided demographic and infrastructure inventories are compiled from existing national datasets. A Level 2 analysis improves the loss estimates by considering additional data such as improved flood inundation modeling results or significant updates to the demographic and / or infrastructure inventory. A Level 3 analysis generally requires extensive time, resources, and effort in order to modify the Hazus-MH model to fit specific community, location, or geographic region. An example of a Level 3 analysis would be a study in which site-specific building inventory data are used to calculate flood losses for individual building. This type of analysis is referred to as a user defined facility (UDF) analysis.

Level 1 Hazus-MH flood-loss-modeling was utilized to create a flood-hazard assessment report for each of the 102 Illinois County's. Updating building and infrastructure data or performing hydraulic modeling to created detailed depth grids for all counties in Illinois could be done in the future but was beyond the scope of this project. For each county, we estimated the potential flood losses within the 100-year floodplain. *Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale*

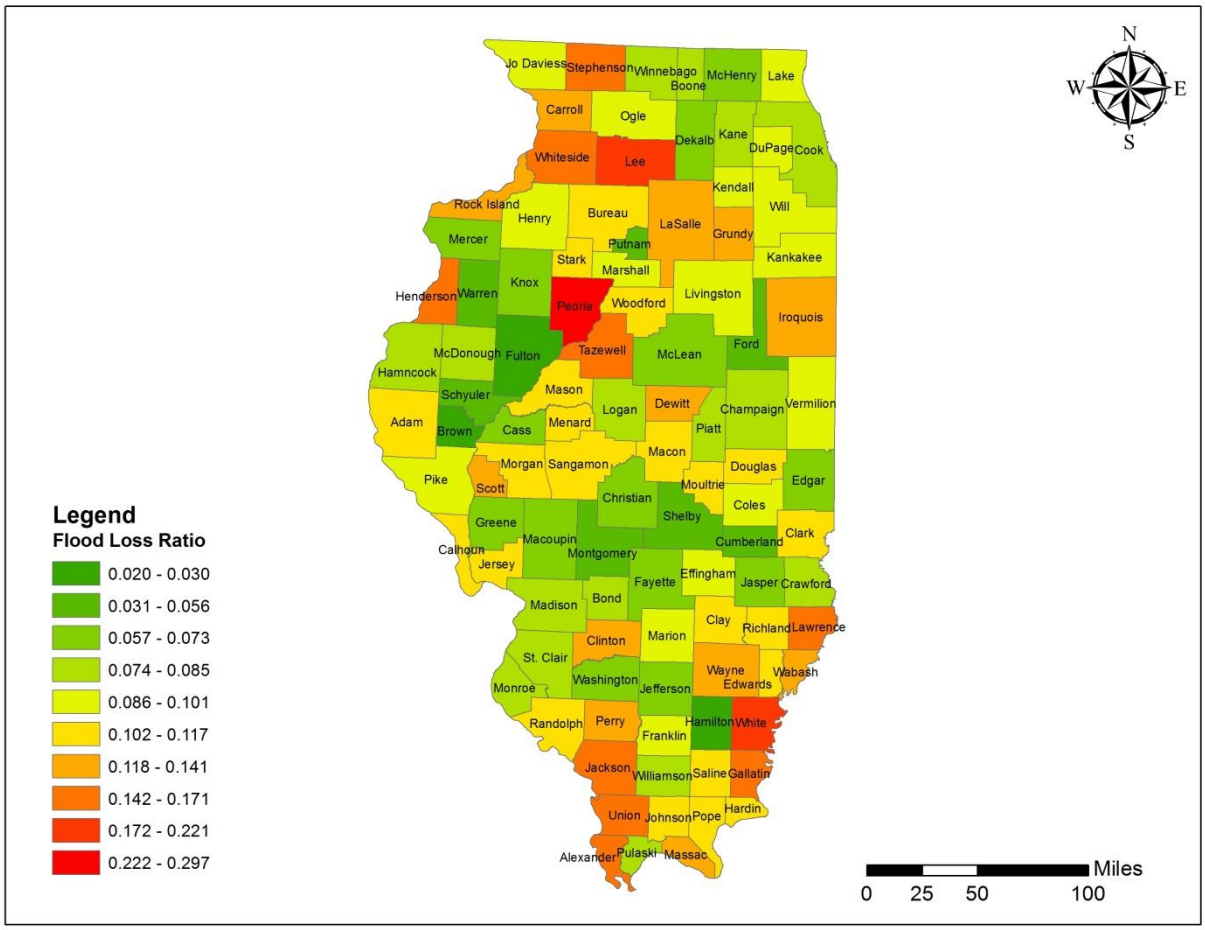


Figure 7 – County flood-loss ratios; values shown are a ratio estimated flood losses in each county's 100-year floodplain relative to total building-related exposure in the floodplain.

As identified in the Illinois Statewide Flood Hazard Assessment, flood vulnerability was quantified as a combined function of potential building-related-economic losses and socioeconomic factors. Differences in socioeconomic factors were incorporated into the analysis because the current social science research suggests that a community's wealth, gender distribution, race, class, and sociopolitical structures can influence the impacts of flood losses, casualties, and the ability the community to recover from a flood disaster. These social factors produce variations in vulnerability among groups of people and geographic locations (Ngo, 2001; Tierney, 2006; Emerson, 2007; Burton and Cutter, 2008, Cutter et al., 2013). To capture both the economic and social aspects of flood vulnerability, Hazus-MH was utilized to quantify potential flood losses within the 100-year floodplain and county-level So VI scores to quantify the social component of a jurisdiction's flood vulnerability.

The flood vulnerability of Illinois counties and incorporated jurisdictions was accomplished in the Illinois Statewide Flood Hazard Assessment, by calculating a Flood Vulnerability Index (FVI) using the Hazus-MH flood-exposure and loss-estimates and SoVI score. Each county's and jurisdiction's FVI score was then used to rank their flood vulnerability.

The FVI values were calculated as follows:

1. The flood-exposure (*Flood* $_{exposure}$) and -loss (*Flood* $_{loss}$) estimates for the 100-year floodplain were calculated using Hazus-MH (see Flood-Loss Modeling section above for details).

2. A flood loss ratio (*Loss* $_{ratio}$) was calculated to normalize flood-loss estimation parameter so that urban jurisdictions with large absolute values of flood exposure could be more easily compared with rural jurisdictions with smaller levels of flood exposure.

$$Loss_{ratio} = \frac{Flood_{loss}}{Flood_{exposure}}$$

(Eq. 1)

3. The SoVI (HVRI, 2012) was assigned to its respective county and jurisdictions.

4. Hazus-MH does not calculate flood exposure and losses at jurisdictional scales. The minimum spatial scale at which Hazus-MH calculates flood exposure and losses is at the census block level. In order to ascribe the exposure and flood estimates to a particular jurisdiction, we used the spatial join tool within ArcMap. The join tool summed flood -exposure and -loss estimates from the census blocks that were either fully or partly contained within each jurisdiction's boundaries.

5. In order to account for the overlap of census blocks outside a jurisdictional boundary, a floodplain area weighting factor was calculated and then used to weight the jurisdictional flood-loss ratio. This provided a more realistic estimate of a jurisdiction's flood-loss ratio. The floodplain area weighting factor (FP_{wf}) was calculated by dividing the 100-year floodplain area (FP_{area}) within the jurisdiction by the total area of the jurisdiction (JD_{area}).

$$FP_{wf} = \frac{JD_{area}}{FP_{area}}$$

(Eq. 2)

The floodplain area weighting factor was then multiplied by the jurisdiction's loss ratio to calculate the weighted flood loss ratio ($WLoss_{Ratio}$).

$$WLoss_{Ratio} = Loss_{Ratio} \times FP_{wf}$$

(Eq. 3)

6. The county flood-loss ratio, jurisdictional weighted flood-loss ratio and SoVI scores were combined to create a flood-loss index (FLI) and SoVI at the county and jurisdictional levels. The general indexing formula for the FLI and SoVI are as follows. The index (I_i) corresponding to each respective index (FLI and SoVI) indicator for i^{th} county or jurisdiction

is calculated using the following equation, which normalizes each index value to a range from 0.0 to 1.0:

$$I_i = \frac{I_i - I_{min}}{I_{max} - I_{min}}$$

(Eq. 4)

where I_{min} *and* I_{max}, are the minimum and maximum values of these indicators for all the counties or jurisdictions, respectively, and I_i is the actual value of the indicator for i th county or jurisdiction.

7. The FLI and SoVI were added together to calculate a flood score (*FS*) for each county and jurisdiction.

$$FS = FLI + SoVI$$

(Eq. 5)

8. The *FS* were normalized so each county or jurisdiction could be ranked by flood vulnerability relative to other Illinois counties and jurisdictions. The flood score was index (FS_i) was calculated using Equation 4.

9. A z-score (*z*) for the FS_i for each county or jurisdiction was calculated in order to rigorously qualify their relative flood vulnerability.

$$z = \frac{FS_i - \mu}{\sigma}$$

(Eq. 6)

where:
FS_i is the actual flood score for i th county or jurisdiction;
 is the mean of the county or jurisdictional flood scores; and
σ is the standard deviation the flood scores.

The z-score was used to assign the relative flood vulnerability description to each jurisdiction (Table 3).

Table 3 – Relative flood vulnerability description for the z or standard score

z – Score Range	Relative Flood Vulnerability Description
5.0 to 1.6	High
1.5 to 0.6	Elevated
0.5 to -0.5	Average
-0.6 to -3.0	Low

Vulnerability to flooding was assessed in the ISFA by calculating a Flood Vulnerability Index (FVI) that combines Hazus-based estimates of flood exposure and loss with the widely utilized Social Vulnerability Index (SoVI; HVRI, 2012). The modeling results suggest the least flood vulnerably county is Kendall County and the most vulnerable county is Alexander County. The results also suggest that Boulder Hill is one of the least flood vulnerable jurisdictions in Illinois that contains a FEMA Special Flood Hazard Area (100-year floodplain) and Gulfport, IL is the most flood-vulnerable jurisdiction. The ten most vulnerable jurisdictions in Illinois, identified by Hazus-MH are listed in Table 1. Individual county rankings are identified in the flood loss estimate table of this section.

The highest vulnerability scores (FVI) and vulnerability ratings are generally in the rural counties and communities located along Illinois's larger rivers. The greatest concentration of jurisdictions with high vulnerability rating is in the portions of southern Illinois bordering the Mississippi and Ohio Rivers. The other jurisdictions with high flood vulnerability ratings were located along other major rivers such as the Green, Illinois, Kaskaskia, and Rock Rivers (Figures 9).

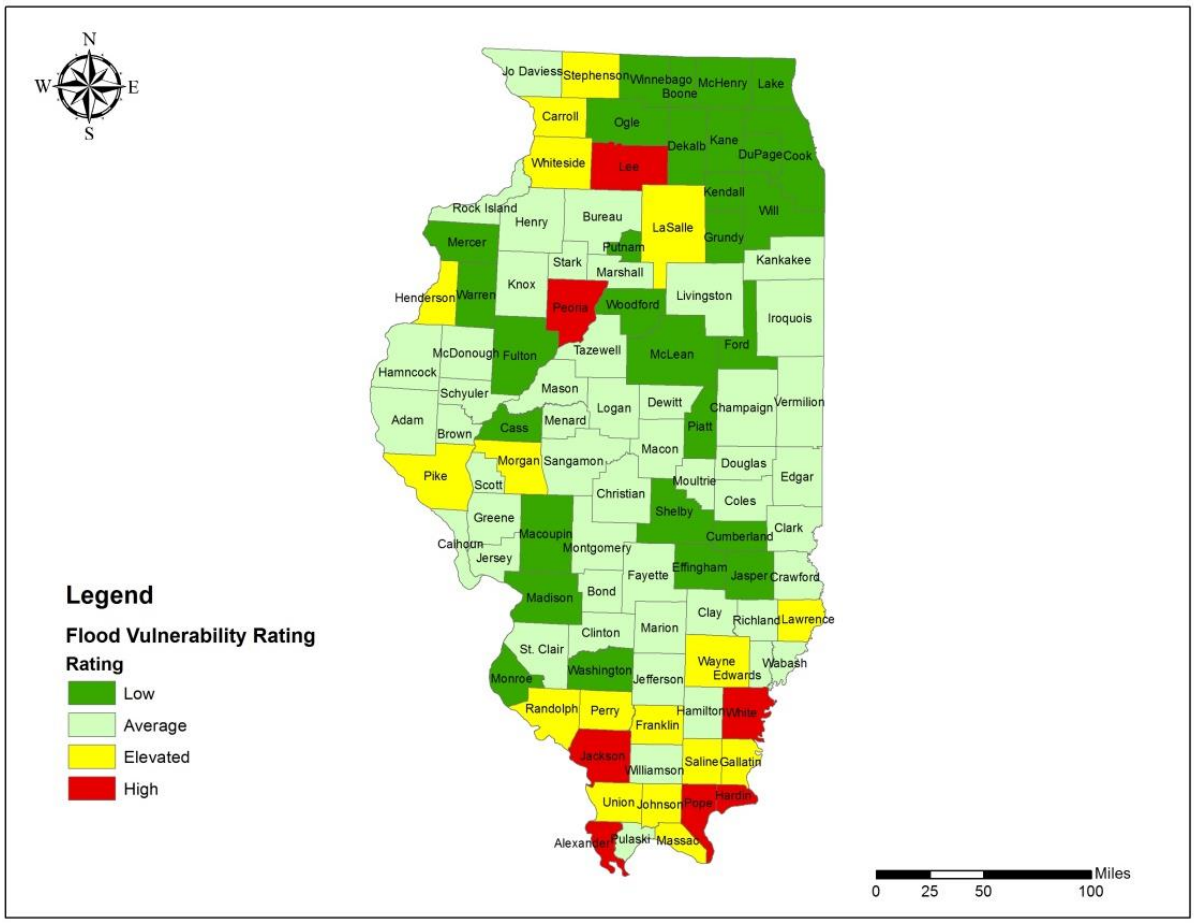


Figure 9 - Flood vulnerability ratings for the 102 counties in Illinois. These vulnerability ratings are categorical representations (low, average, elevated, or high) of the flood vulnerability index (FVI; see text).

Table 1 – Identified by Hazus-MH: The ten jurisdictions in Illinois most vulnerable to flooding

Town/City	Rank	Total Losses ($1000)	Total Exposure ($1000)	Loss Index	SoVI Index	Flood Score	Flood Vulnerability Index	Flood Vulnerability Rating
Gulf Port	1	6,135	23,775	1.000	0.606	1.606	1.000	High
East Cape Girardeau	2	6,213	43,849	0.560	1.000	1.560	0.971	High
Naples	3	3,618	15,753	0.886	0.587	1.472	0.917	High
Grand Tower	4	11,332	56,161	0.722	0.743	1.465	0.912	High
Old Shawneetown	5	3,913	22,190	0.697	0.722	1.419	0.883	High
McClure	6	3,820	27,457	0.550	0.823	1.372	0.854	High
Liverpool	7	3,593	21,226	0.669	0.682	1.350	0.841	High
Maunie	8	1,696	11,862	0.565	0.785	1.350	0.840	High
Gorham	9	3,098	20,789	0.499	0.743	1.242	0.773	High
Cairo	10	27,391	243,913	0.307	0.867	1.174	0.731	High

Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale

National Flood Insurance Program (NFIP)

In 1968, Congress created the National Flood Insurance Program (NFIP) to help provide a means for property owners to financially protect themselves. The NFIP offers flood insurance to homeowners, renters, and business owners if their community participates in the NFIP. Participating communities agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding (FEMA Flood Smart) The NFIP is a voluntary program based on a mutual agreement between the federal government and the local community. The Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR) is the state coordinating agency for the NFIP and is a leader in the nation for NFIP coordination. Currently, 82 counties and 871 communities in Illinois have adopted a local floodplain ordinance and participate in the National Flood Insurance Program. Both FEMA and the Illinois Office of Water Resources have established floodplain management standards for communities to follow. These regulations prevent future flood losses from occurring. The area of the state with the greatest growth (Northeastern Illinois) has adopted floodplain regulations that go beyond the requirements of the NFIP. These areas only allow appropriate open space uses in the floodway and any development in the floodway requires compensatory storage. This area also has the largest and best trained staff in code and zoning enforcement. As a result, very few new structures in Illinois are out of compliance with the NFIP.

Total communities in the NFIP: 871
Communities not in the NFIP: 128
Total polices: 49,068
Average premium: $881
Total coverage: $8,726,759,100
Total claims (since 1978): 46826
Total paid damages: 460,804,748

Illinois also encourages jurisdictions to participate in the National Flood Insurance Program's (NFIP) Community Rating System (CRS) which is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. The Community Rating System (CRS) is a voluntary program which provides incentives in the form of premium discounts for communities which go above-and-beyond minimum floodplain management standards. The State of Illinois is very proud of the way communities have embrace the Community Rating System (CRS). Illinois leads the nation in participation for non-coastal states and is ranked 6th overall in the United States with 56 CRS communities. Illinois also has ten communities that have achieved a Class 5 rating which results in a 25% reduction in flood insurance premiums. This distinction ranks us 3rd nation-wide and 1st for non-coastal communities. Not only do we have the largest number of CRS communities among inland states, we are also national leaders when it comes to floodplain management. The citizens of Illinois will realize nearly $1.5 million in savings due to CRS. Based strictly on Illinois' state regulations, every community in the state could be achieving a 10% reduction in flood premiums simply by joining CRS. This speaks loudly of everyone who works with floodplain management in Illinois.

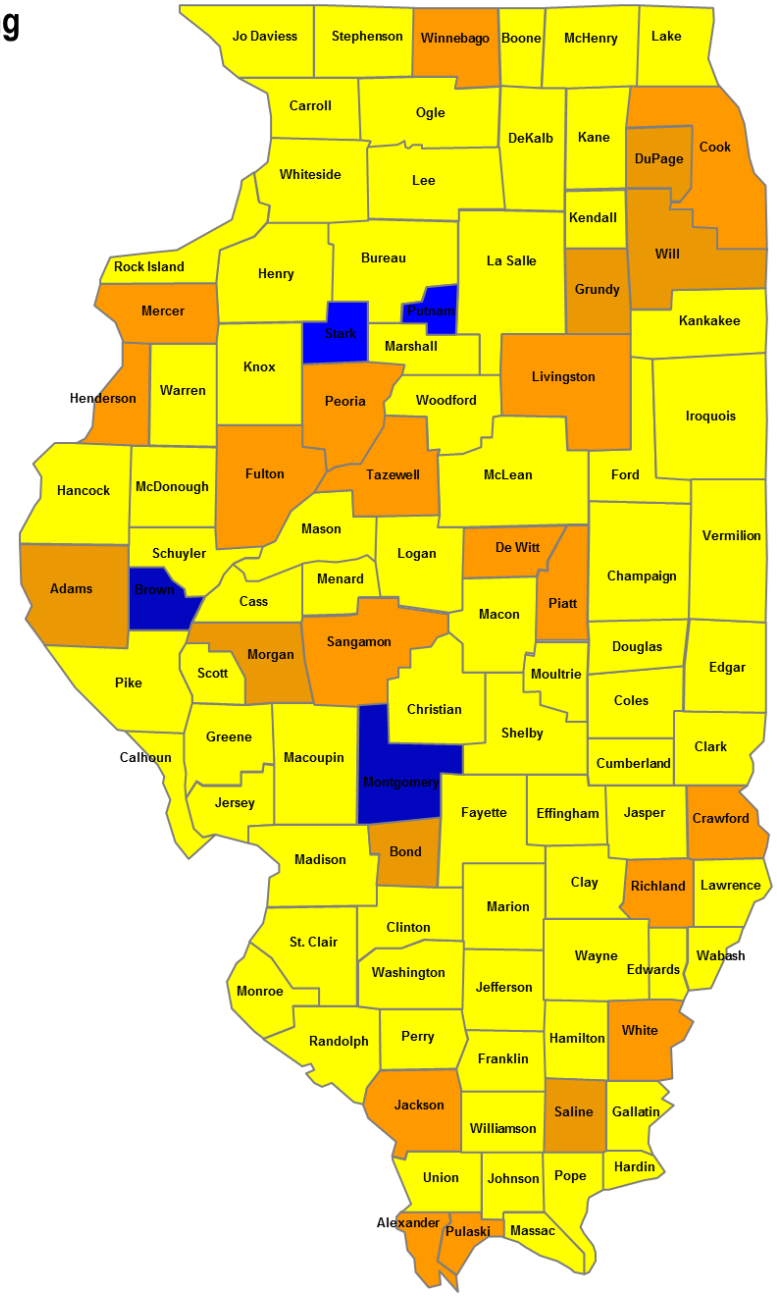
Illinois currently has over 56 communities participating in the CRS program, ranking it 6th in the nation in CRS communities. Of these communities, 10 are rated as a Class 5 community which results in a 25% reduction in flood insurance premiums. This distinction ranks Illinois 3rd nation-wide and 1st for non-coastal communities.

COMPARISON OF FLOOD DATA BY COUNTY 7-1-2013

Hazard Rating Process	History	Repetitive Loss	100 Year Floodzone
Alexander	Calhoun	Cook	Gallatin
Jackson	Pike	Peoria	White
Saline	Adams	Jersey	Lawrence
Sangamon	Cook	Calhoun	Monroe
White	Schuyler	DuPage	Clinton
Winnebago	Jersey	Winnebago	Calhoun
Pulaski	Green	Rock Island	Scott
Richland	Cass	Will	Massac
Crawford	Monroe	Lake	Saline
Bond	Alexander	LaSalle	Wabash
Morgan	Randolph	Kankakee	Jackson
Adams	St. Clair	Fulton	Union
Henderson	Hancock	Woodford	Pulaski
Mercer	Mason	Grundy	Hamilton
Fulton	Brown	McHenry	Pike
Peoria	Rock Island	Henderson	Randolph
Livingston	Carroll	St. Clair	Wayne
Grundy	Scott	Tazewell	Franklin
Will	Jackson	Pike	Whiteside
DuPage	Madison	Mason	
Cook	Pulaski	Jo Daviess	
	Fulton	Ogle	
	Whiteside	Cass	
	Jo Daviess	Alexander	

IEMA **Illinois Natural Hazard Mitigation Plan**

Flood Hazard Rating by County



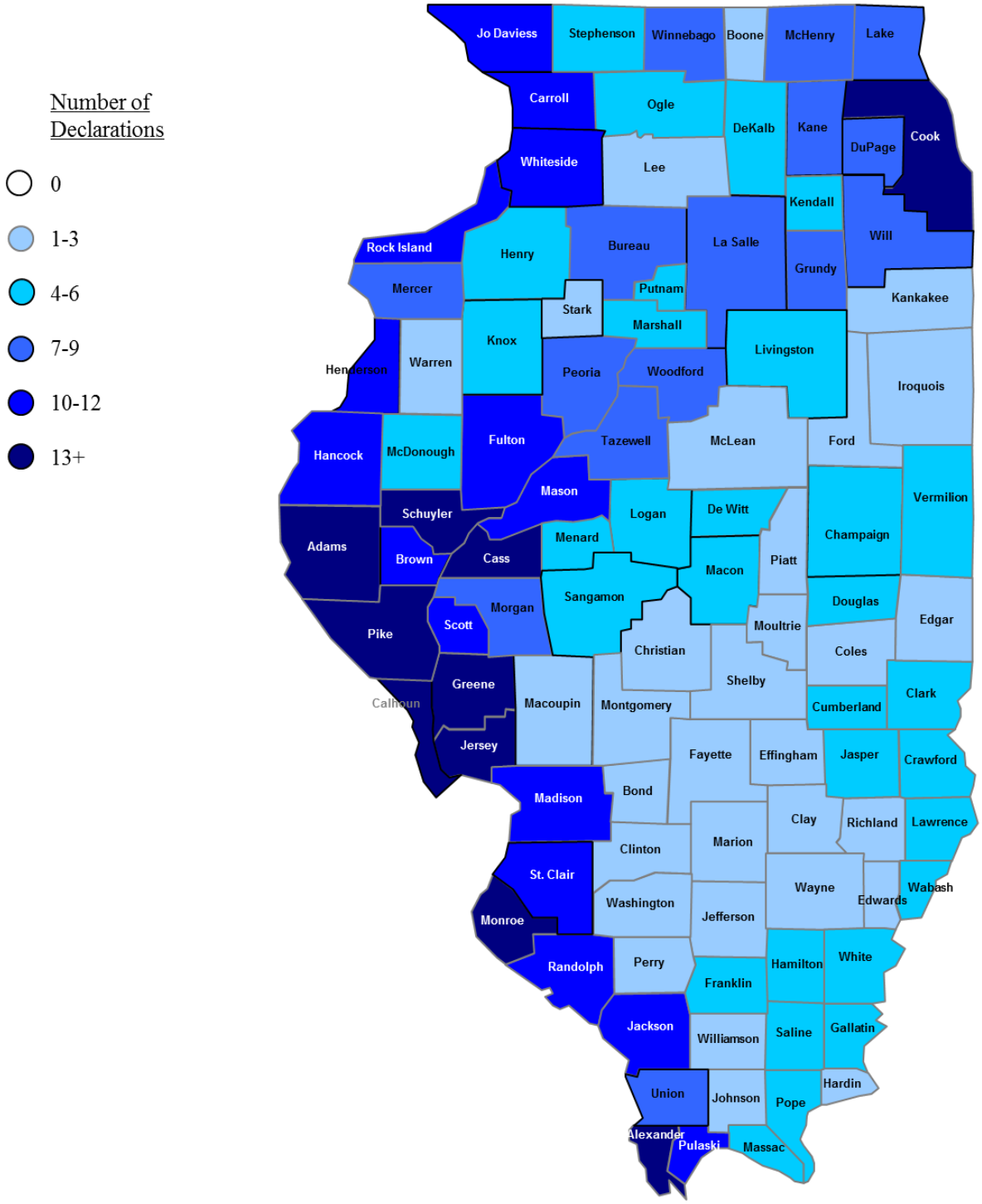
Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a county by county basis

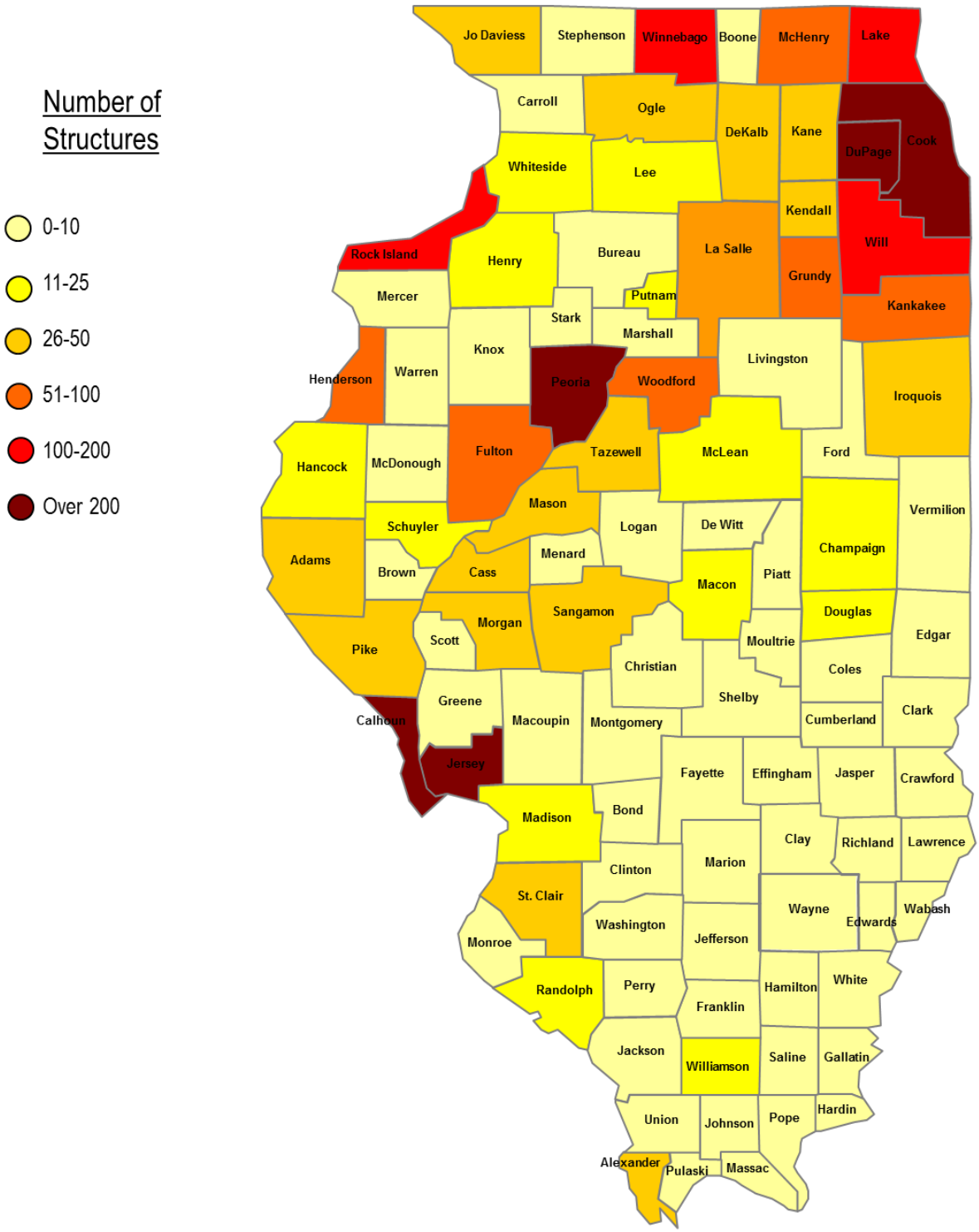
IEMA

State of Illinois
Federally Declared Flood Disasters by County
1/1/1965-7/1/2013



IEMA

State of Illinois
Repetitive Loss Structures by County
7/1/2013



•Based off of most recent data FEMA supplied (6-2013) *Data contained repetitive loss properties as well as mitigated properties.

The tables below provide a listing of the top 20 jurisidictions and top 15 counties with the highest insurance payouts to repetitive loss properties. The information was supplied by IDNR, from a repetitive loss dataset. The table includes information related to the number repetitive loss properties including the number of losses and insurance payment amounts. The repetitive loss list excludes those structures that have already been mitigated. The county listing is for repetitive loss properties located in unincorporated areas within said county. The previous map represents the total repetitive loss numbers for the county.

Community Repetitive Loss Listing

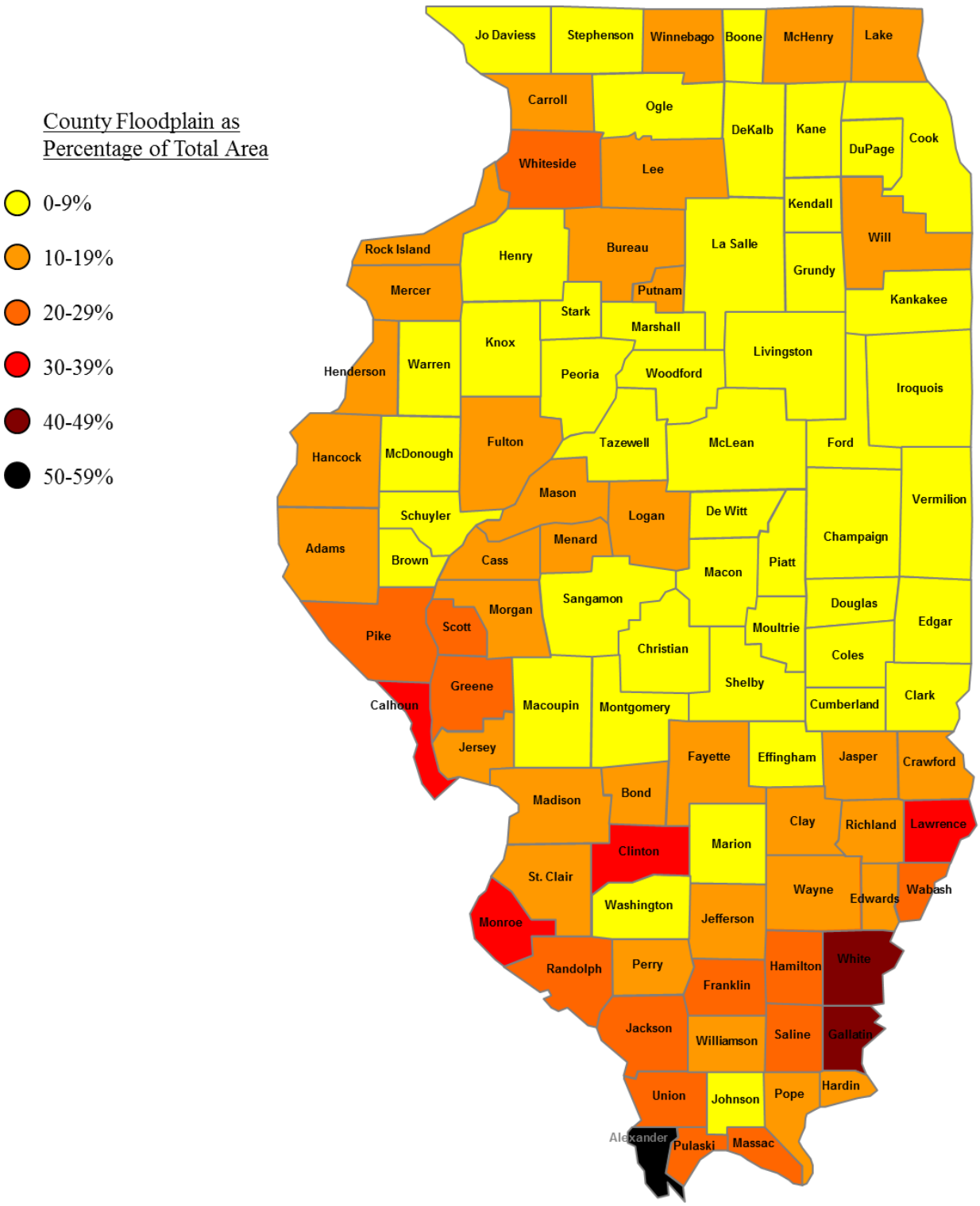
Community Name	Number of Repetitive Loss Properties	Number of Losses	Total Insurance Claims Paid	Average Insurance Claim Paid
Rockford	120	249	$6,883,285.97	$3,415,301.86
Des Plaines	86	245	$5,282,518.22	$1,884,557.16
South Holland	38	92	$625,832.96	$253,316.65
Machesney Park	30	84	$1,627,946.98	$560,059.20
Peoria Heights	28	149	$1,291,674.75	$224,006.38
East Dubuque	27	90	$965,708.10	$263,759.70
Watseka	25	58	$770,509.77	$355,845.15
Dolton	24	54	$333,747.25	$140,983.30
Peoria	24	98	$100,295.09	$296,886.10
Markham	21	50	$417,777.21	$143,782.79
Fox Lake	21	61	$481,876.03	$154,843.97
Bellwood	20	43	$267,654.09	$113,927.93
Grafton	20	80	$911,362.22	$238,329.60
Glenview	19	48	$1,048,852.30	$397,598.19
Stone Park	19	49	$504,135.53	$182,784.30
Harvey	18	41	$140,267.23	$62,668.32
Skokie	18	51	$607,833.58	$125,052.69
Chicago	17	40	$953,638.82	$393,054.22
East St. Louis	17	43	$330,138.97	$125,143.81
Kampsville	16	62	$1,160,144.59	$179,495.39

County Repetitive Loss Listing

County Name	Number of Repetitive Loss Properties	Number of Losses	Total Insurance Claims Paid	Average Insurance Claim Paid
Peoria	138	520	$5,054,282.45	$1,263,689.33
Jersey	111	468	$5,453,655.91	$1,285,041.98
Will	94	292	$3,757,466.58	$1,127,426.80
Rock Island	78	274	$2,660,687.88	$853,454.70
Calhoun	70	267	$2,394,302.47	$637,405.84
Kankakee	66	189	$2,213,200.70	$779,448.65
Woodford	51	167	$1,584,490.67	$496,610.89
Cook	49	141	$1,485,087.44	$517,966.32
McHenry	36	106	$985,862.13	$316,073.67
Grundy	28	68	$994,324.52	$438,057.42
Lake	23	66	$661,293.46	$227,960.08
Winnebago	22	73	$932,635.47	$242,017.43
Mason	21	76	$697,456.10	$169,084.88
Ogle	19	66	$809,709.52	$248,475.10
Henderson	19	54	$853,057.52	$325,838.21

IEMA

State of Illinois
100-Year Floodplain Proportional Area
7/1/2013



Loss Estimation according to Hazus-MH For Floods

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Alexander	1	54730	350565	0.16	0.49	4.75	1.00	1.49	1.00	2.7	High
Peoria	2	1007400	3391926	0.30	1.00	-1.56	0.47	1.47	0.98	2.6	High
White	3	70270	355209	0.20	0.64	2.19	0.78	1.43	0.95	2.4	High
Pope	4	21750	185248	0.12	0.35	4.11	0.95	1.30	0.84	1.9	High
Lee	5	161510	730949	0.22	0.73	-0.53	0.56	1.28	0.83	1.8	High
Hardin	6	12680	113683	0.11	0.33	3.91	0.93	1.26	0.81	1.7	High
Jackson	7	154400	998106	0.15	0.49	1.69	0.74	1.23	0.79	1.6	High
LaSalle	8	281280	2060057	0.14	0.42	1.92	0.76	1.18	0.75	1.4	Elevated
Gallatin	9	24840	169928	0.15	0.46	1.44	0.72	1.18	0.75	1.4	Elevated
Johnson	10	32240	275579	0.12	0.35	2.26	0.79	1.14	0.72	1.2	Elevated
Henderson	11	30510	184335	0.17	0.53	0.06	0.61	1.13	0.71	1.2	Elevated
Lawrence	12	56700	336329	0.17	0.54	-0.23	0.58	1.12	0.70	1.1	Elevated
Perry	13	35330	272062	0.13	0.40	1.32	0.71	1.11	0.69	1.1	Elevated
Union	14	70000	474138	0.15	0.46	0.53	0.65	1.11	0.69	1.1	Elevated
Whiteside	15	154200	947245	0.16	0.52	-0.4	0.57	1.08	0.67	1.0	Elevated
Saline	16	75220	673263	0.11	0.33	1.68	0.74	1.07	0.66	1.0	Elevated
Carroll	17	57950	409575	0.14	0.44	0.32	0.63	1.07	0.66	0.9	Elevated
Stephenson	18	129770	851978	0.15	0.48	-0.17	0.59	1.06	0.66	0.9	Elevated
Massac	19	38920	312129	0.12	0.38	0.87	0.67	1.05	0.65	0.9	Elevated
Franklin	20	40530	441770	0.09	0.26	2.24	0.79	1.05	0.64	0.8	Elevated
Wayne	21	23770	170222	0.14	0.43	-0.07	0.59	1.03	0.63	0.8	Elevated
Morgan	22	85850	792258	0.11	0.32	0.87	0.67	0.99	0.60	0.6	Elevated
Randolph	23	63950	597776	0.11	0.31	0.88	0.67	0.99	0.60	0.6	Elevated
Pike	24	14370	152930	0.09	0.27	1.43	0.72	0.99	0.60	0.6	Elevated
Rock Island	25	342530	2505693	0.14	0.42	-0.63	0.55	0.97	0.58	0.5	Average
Pulaski	26	14340	169434	0.08	0.23	1.59	0.73	0.97	0.58	0.5	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Marion	27	53940	572355	0.09	0.27	1.15	0.70	0.97	0.58	0.5	Average
Tazewell	28	454300	2661830	0.17	0.54	-2.25	0.41	0.96	0.57	0.5	Average
Wabash	29	15850	130800	0.12	0.36	-0.14	0.59	0.95	0.57	0.5	Average
Vermilion	30	123600	1243312	0.10	0.29	0.65	0.66	0.94	0.56	0.4	Average
Adam	31	110210	947578	0.12	0.35	-0.13	0.59	0.94	0.56	0.4	Average
Calhoun	32	27620	250702	0.11	0.33	0.09	0.61	0.93	0.55	0.4	Average
Dewitt	33	41170	302236	0.14	0.42	-1.07	0.51	0.93	0.55	0.4	Average
Mason	34	18420	166071	0.11	0.33	-0.02	0.60	0.93	0.55	0.4	Average
Richland	35	32620	302456	0.11	0.32	0.11	0.61	0.93	0.55	0.4	Average
Knox	36	37840	515381	0.07	0.19	1.54	0.73	0.92	0.54	0.3	Average
Iroquois	37	87070	700991	0.12	0.38	-0.65	0.55	0.92	0.54	0.3	Average
Clay	38	15870	141698	0.11	0.33	-0.25	0.58	0.91	0.54	0.3	Average
Macon	39	212940	1925620	0.11	0.33	-0.24	0.58	0.91	0.53	0.3	Average
Bureau	40	63980	574753	0.11	0.33	-0.4	0.57	0.90	0.52	0.2	Average
Moultrie	41	34240	327897	0.10	0.30	-0.12	0.59	0.90	0.52	0.2	Average
Brown	42	2600	112709	0.02	0.01	3.35	0.88	0.89	0.52	0.2	Average
Clark	43	21010	198880	0.11	0.31	-0.29	0.58	0.89	0.51	0.2	Average
Marshall	44	27760	273602	0.10	0.29	-0.34	0.57	0.87	0.50	0.1	Average
Williamson	45	97300	1142675	0.09	0.23	0.33	0.63	0.86	0.50	0.1	Average
Clinton	46	125260	962267	0.13	0.40	-1.64	0.46	0.86	0.49	0.1	Average
Edwards	47	5670	49066	0.12	0.34	-1.09	0.51	0.85	0.49	0.1	Average
McDonough	48	33700	429648	0.08	0.21	0.44	0.64	0.85	0.49	0.0	Average
Scott	49	13410	104179	0.13	0.39	-1.81	0.45	0.84	0.48	0.0	Average
Schuyler	50	3070	54524	0.06	0.13	1.29	0.71	0.84	0.48	0.0	Average
Coles	51	63890	648722	0.10	0.28	-0.6	0.55	0.83	0.47	0.0	Average
Greene	52	9120	136790	0.07	0.17	0.75	0.66	0.83	0.47	0.0	Average
Jefferson	53	40080	580847	0.07	0.18	0.61	0.65	0.83	0.47	-0.1	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Stark	54	8350	80955	0.10	0.30	-0.92	0.52	0.82	0.46	-0.1	Average
Logan	55	33330	413402	0.08	0.22	-0.06	0.60	0.81	0.46	-0.1	Average
Christian	56	26400	375896	0.07	0.18	0.35	0.63	0.81	0.46	-0.1	Average
Fayette	57	16670	253200	0.07	0.17	0.53	0.65	0.81	0.45	-0.1	Average
Livingston	58	74040	819864	0.09	0.25	-0.53	0.56	0.81	0.45	-0.1	Average
Douglas	59	50080	470359	0.11	0.31	-1.27	0.49	0.81	0.45	-0.1	Average
Montgomery	60	11950	252162	0.05	0.10	1.23	0.70	0.80	0.45	-0.2	Average
Crawford	61	21050	284808	0.07	0.19	0.09	0.61	0.80	0.45	-0.2	Average
Jo Daviess	62	75040	795935	0.09	0.27	-0.93	0.52	0.79	0.44	-0.2	Average
Jersey	63	36090	328308	0.11	0.32	-1.71	0.46	0.78	0.43	-0.2	Average
Kankakee	64	198930	2071666	0.10	0.27	-1.23	0.50	0.77	0.42	-0.3	Average
Hancock	65	28950	379773	0.08	0.20	-0.38	0.57	0.77	0.42	-0.3	Average
Sangamon	66	309090	2685773	0.12	0.34	-2.12	0.42	0.77	0.42	-0.3	Average
Edgar	67	11570	184342	0.06	0.15	0.09	0.61	0.76	0.42	-0.3	Average
Hamilton	68	4030	135221	0.03	0.03	1.32	0.71	0.75	0.40	-0.4	Average
Henry	69	57330	614438	0.09	0.26	-1.59	0.47	0.73	0.39	-0.5	Average
Menard	70	22730	215605	0.11	0.31	-2.12	0.42	0.73	0.39	-0.5	Average
Bond	71	20510	267956	0.08	0.20	-0.95	0.52	0.72	0.39	-0.5	Average
Jasper	72	12540	173289	0.07	0.19	-0.9	0.53	0.71	0.38	-0.5	Average
Cook	73	3273790	43728088	0.07	0.20	-1.01	0.52	0.71	0.38	-0.5	Average
Shelby	74	13180	242679	0.05	0.12	-0.17	0.59	0.71	0.37	-0.5	Average
Winnebago	75	467060	5588832	0.08	0.23	-1.45	0.48	0.71	0.37	-0.5	Average
St. Clair	76	202020	2509109	0.08	0.22	-1.36	0.49	0.70	0.37	-0.6	Low
Cass	77	10230	162022	0.06	0.16	-0.63	0.55	0.70	0.37	-0.6	Low
Ogle	78	126530	1252250	0.10	0.29	-2.26	0.41	0.70	0.37	-0.6	Low
Macoupin	79	13700	215085	0.06	0.16	-0.72	0.54	0.70	0.36	-0.6	Low
Ford	80	2390	50666	0.05	0.10	-0.02	0.60	0.70	0.36	-0.6	Low

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Warren	81	6680	141830	0.05	0.10	-0.04	0.60	0.69	0.36	-0.6	Low
Effingham	82	55360	622949	0.09	0.25	-1.97	0.44	0.68	0.35	-0.7	Low
Fulton	83	9250	459592	0.02	0.00	0.96	0.68	0.68	0.35	-0.7	Low
Washington	84	14610	214510	0.07	0.17	-1.13	0.51	0.68	0.35	-0.7	Low
Champaign	85	151490	1960497	0.08	0.21	-1.7	0.46	0.66	0.34	-0.7	High
Mercer	86	15760	238450	0.07	0.17	-1.56	0.47	0.64	0.31	-0.8	Low
Grundy	87	121980	1008513	0.12	0.36	-3.96	0.27	0.63	0.31	-0.9	Low
Cumberland	88	10390	205235	0.05	0.11	-1.05	0.51	0.62	0.30	-0.9	Low
Madison	89	225880	2960648	0.08	0.20	-2.23	0.41	0.62	0.30	-0.9	Low
Woodford	90	61660	579495	0.11	0.31	-3.65	0.29	0.61	0.29	-1.0	Low
Piatt	91	30900	368835	0.08	0.23	-2.7	0.37	0.60	0.29	-1.0	Low
Putnam	92	7350	136742	0.05	0.12	-2.23	0.41	0.53	0.23	-1.3	Low
DeKalb	93	103050	1494590	0.07	0.18	-3.01	0.35	0.52	0.23	-1.3	Low
Monroe	94	49310	612245	0.08	0.22	-3.83	0.28	0.50	0.20	-1.4	Low
McLean	95	131850	2137957	0.06	0.15	-3.7	0.29	0.44	0.16	-1.7	Low
Boone	96	61430	780967	0.08	0.21	-4.51	0.22	0.43	0.15	-1.7	Low
Kane	97	702320	8717526	0.08	0.22	-5.06	0.18	0.39	0.12	-1.8	Low
Will	98	1399440	15129593	0.09	0.26	-5.73	0.12	0.38	0.11	-1.9	Low
Lake	99	2090820	22539796	0.09	0.26	-6	0.10	0.36	0.09	-2.0	Low
DuPage	100	2199620	23666320	0.09	0.26	-6.36	0.07	0.33	0.07	-2.1	Low
McHenry	101	517800	7140216	0.07	0.19	-6.16	0.08	0.27	0.02	-2.3	Low
Kendall	102	104850	1199314	0.09	0.24	-7.15	0.00	0.24	0.00	-2.5	Low

Levee Failure

Description

Levee failure fits into the second definition of flooding " the unusual and rapid accumulation or runoff of surface waters from any source." There are several areas in Illinois that utilize levees to protect land:

a) from peak flood levels, and/or

b) to protect land that is below river level.

What is a Levee?

"A levee is a manmade structure, usually an earthen embankment, which is constructed to contain, control or divert the flow of water in order to provide protection from floods. Levees are generally designed to control water up to a given elevation and, unlike dams; they do not typically have spillways to reduce structural damage if water levels overtop the structure. A levee system is a system, constructed to reduce flood damage, consisting of one or more levees and related structures that are constructed and operated in accordance with sound engineering principles."
Levees and the National Flood Insurance Program, 2013, Water Science & Technology Board, Division on Earth & Life Studies, The National Academy of Sciences (http://nas-sites.org/levees/, access July 11, 2013))

"Levees are man-made barriers along a water course constructed for the primary purpose of providing flood, storm and hurricane protection. Even though levees were originally constructed to protect property and reduce damages from flooding, they have often inadvertently increased flood risks by attracting greater development to the floodplain. In fact, many levees built to protect agricultural fields now stand between waterways and large urban communities." *Recommendations for a National Levee Safety Program*, National Committee on Levee Safety (http://www.leveesafety.org/levee.cfm, access July 11, 2013)

Nature of Hazard

Failure can be grouped into six main failure mechanisms: bearing failure, sliding failure, slump or spreading failure, seepage failure, erosion failure, and over topping (Moss and Eller, 2007). Although, when the water level exceed the design standard for the level, it is not strictly a failure. Many levees have been constructed to meet the criteria for a 1% annual chance flood (a.k.a. 100-year flood). These levees are not designed to withstand a greater event, which may occur less frequently, but is expected to occur.

A bearing failure in levees is typically deep-seated and is most likely induced by seismic ground shaking. Failure is commonly triggered by a seismic event that either causes a loss of soil strength or produces destabilizing inertial loading conditions.

A sliding failure may occur if the foundation soil has a weak or brittle zone resulting in a preferred failure plane. Both seismic induced inertial loading and high water levels can cause sliding failures. Slumping and spreading can be generated by two loading conditions. Cyclic loading from earthquakes may generate increased pore pressures and reduced soil strength, leading to volumetric and/or deviatoric strains in the foundation. The same results can also occur due to increased pore pressures from high water levels and increased seepage.

Seepage is one of the most common failure mechanisms in levees. Levees are built in fluvial depositional environments and it is common to find levees with an existing sandy layer beneath the

foundation. The sandy layer can be a conduit for flow underneath the levee, resulting in critical conditions at the inboard) or landside) toe. This leads to erosion of the foundation during high water or a consistent weakening of the foundation over a long period of time, both eventually leading to failure. Biogenic agents can also lead to destabilizing seepage. This can include rodent holes, tree roots, or other biological activity that create conduits for seepage.

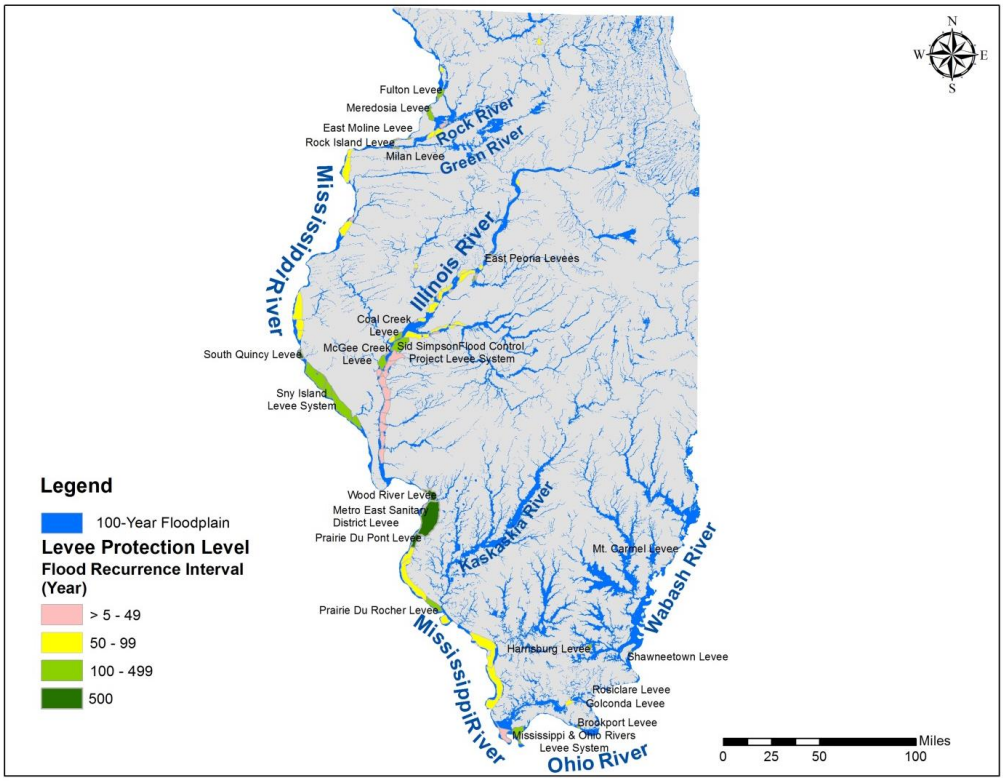
High velocity flows can erode material from the outboard or waterside of the levee, which may lead to instability and failure. Erosion can occur at once or over time as a function of the storm cycle and scale of the peak storms. The failure mechanism of overtopping occurs when high water exceeds the elevation of the levee crest. The water energy is then concentrated at the inboard toe of the levee leading to soil erosion and decreased levee stability. Overtopping failure can be exacerbated by decreased levee crest height due to land subsidence.

Sources:

Moss, R.E.S. and Eller, J.M. (2007) "Estimating the Probability of Failure and Associated Risk of the California Bay Delta Levee System." GeoDenver, Feb.
Illinois State Water Survey, McConkey, Sally (2013)

According to the "Illinois Statewide Flood Hazard Assessment" conducted by the Natural Hazard Research and Mitigation Group (NHRMC) at Southern Illinois University, Carbondale; FEMA-mapped 100-year floodplains in Illinois encompass approximately 7,140 mi^2 or 13% of the State. Within the total Illinois floodplain area, 143 levees, together protecting 1,500 mi^2 of floodplain have been identified. Protection levels of Illinois's levees range from 5- to 10-year flood which are generally privately owned and constructed levees up to 100- and 500-year flood protection level for federally constructed levees which usually protect developed or urban areas.

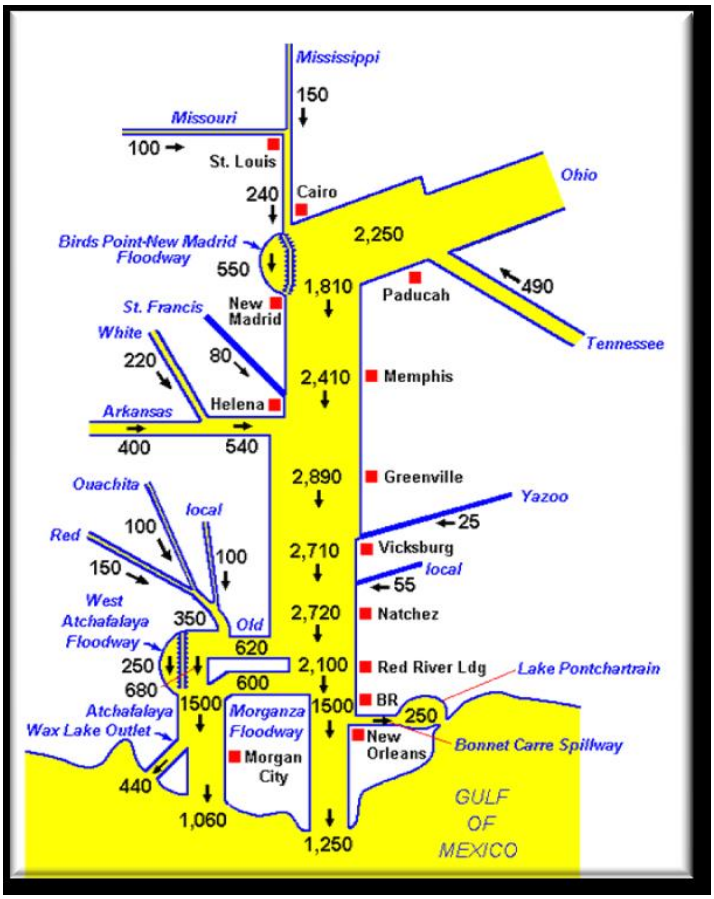
100-year floodplain extent and levees in Illinois. Levees with a protection level of ≥100-year flood are labeled.



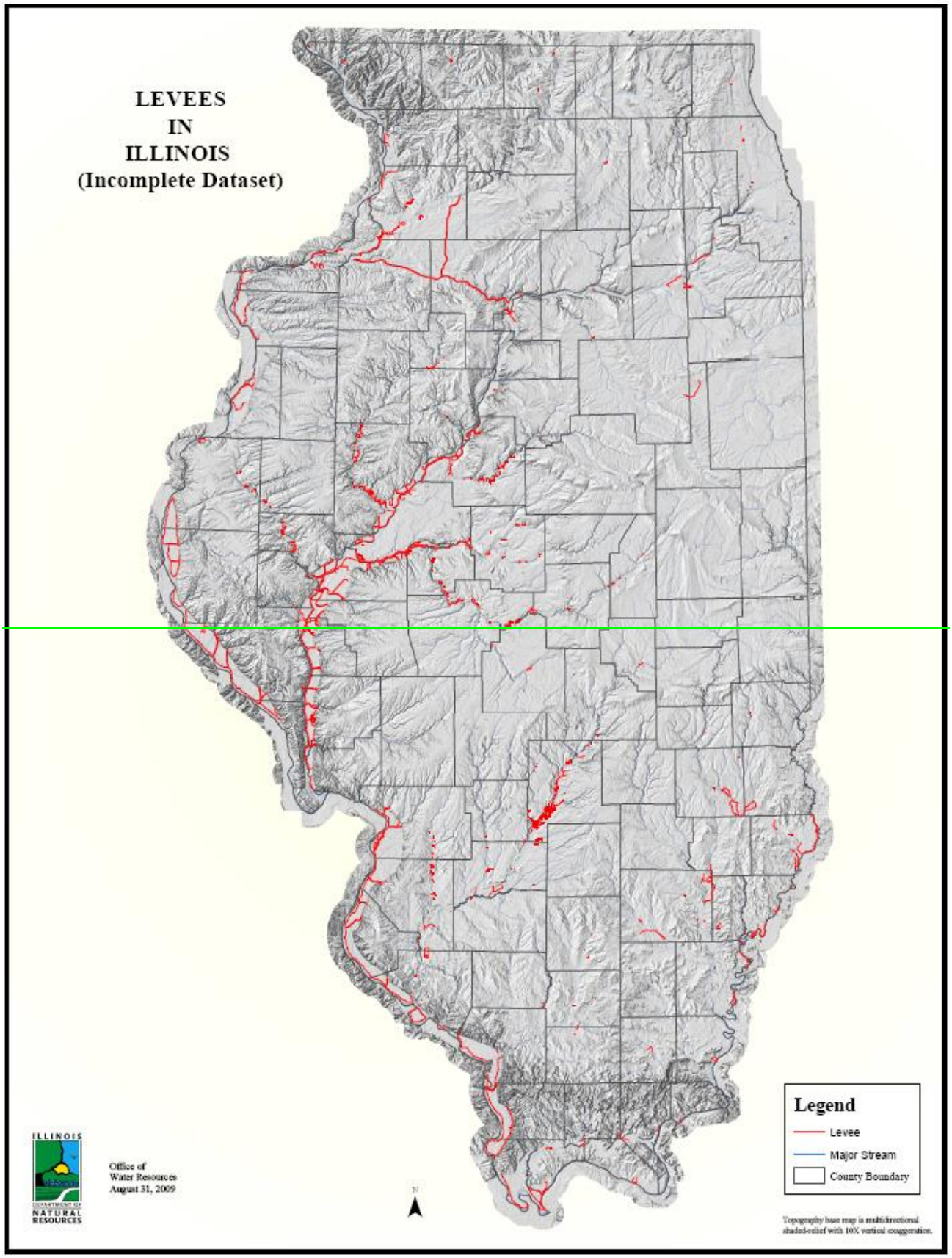
Of the 143 levees identified, the National Levee Database indicates 124 of these participate in or are eligible for the USACE's Public Law 84-99 program (PL-84-99). Enrollment in the PL-84-99 program provides reimbursement for some-flood related damages for levees that are actively maintained and pass regular inspections. Maintenance and proper operation of the levee are intended to prevent routine damage and reduce the possibility of levee failure. In the case of severe flood-related damage to a participating levee, the USACE will provide post-damage assistance.

USACE's levee inspection records showed that 10 of the levee systems in Illinois were rated as "acceptable", 84 levee systems were rated as "minimally acceptable", 28 levees were rated as "unacceptable" or inactive, and 2 were not rated. An acceptable rating indicates no "unacceptable" rating on any inspection criteria, and significantly more "acceptable" criteria ratings than "minimally acceptable" ratings. Minimally acceptable indicates no "unacceptable" rating on any inspection criteria, and generally fewer "acceptable" criteria than "minimally acceptable" ratings. An "unacceptable" levee rating indicated one or more "unacceptable" results on any of the inspection criteria. Unacceptable ratings are generally interpreted to mean that a levee has one or more structural or operational deficiency that could result in it not performing to design specification during a large flood. Levees with an overall unacceptable rating are often moved from active to inactive status within the PL-84-99 program until the necessary repairs to the levee system are made. The "Illinois Statewide Flood Assessment" lists unacceptable and inactive levees in Illinois; while providing details for all 143 levees identified in Illinois.

The first figure is a schematic of the Mississippi River and Tributaries flood protection system which has a combination of levees and overflow areas (in this instance called floodways). The second figure show levees in Illinois identified in the US Army Corps of Engineers National levee Database combined with levees identified in FEMA's midterm levee database. These maps are being updated continuously as the levee index is amended. The third diagram is a more detailed map showing the levees in the St. Louis USACE District.



Schematic of the Mississippi River and Tributary system.


LEVEES
IN
ILLINOIS
(Incomplete Dataset)
Legend
Levee
Major Stream
County Boundary
ILLINOIS
DEPARTMENT OF
NATURAL
RESOURCES
Office of
Water Resources
August 31, 2009
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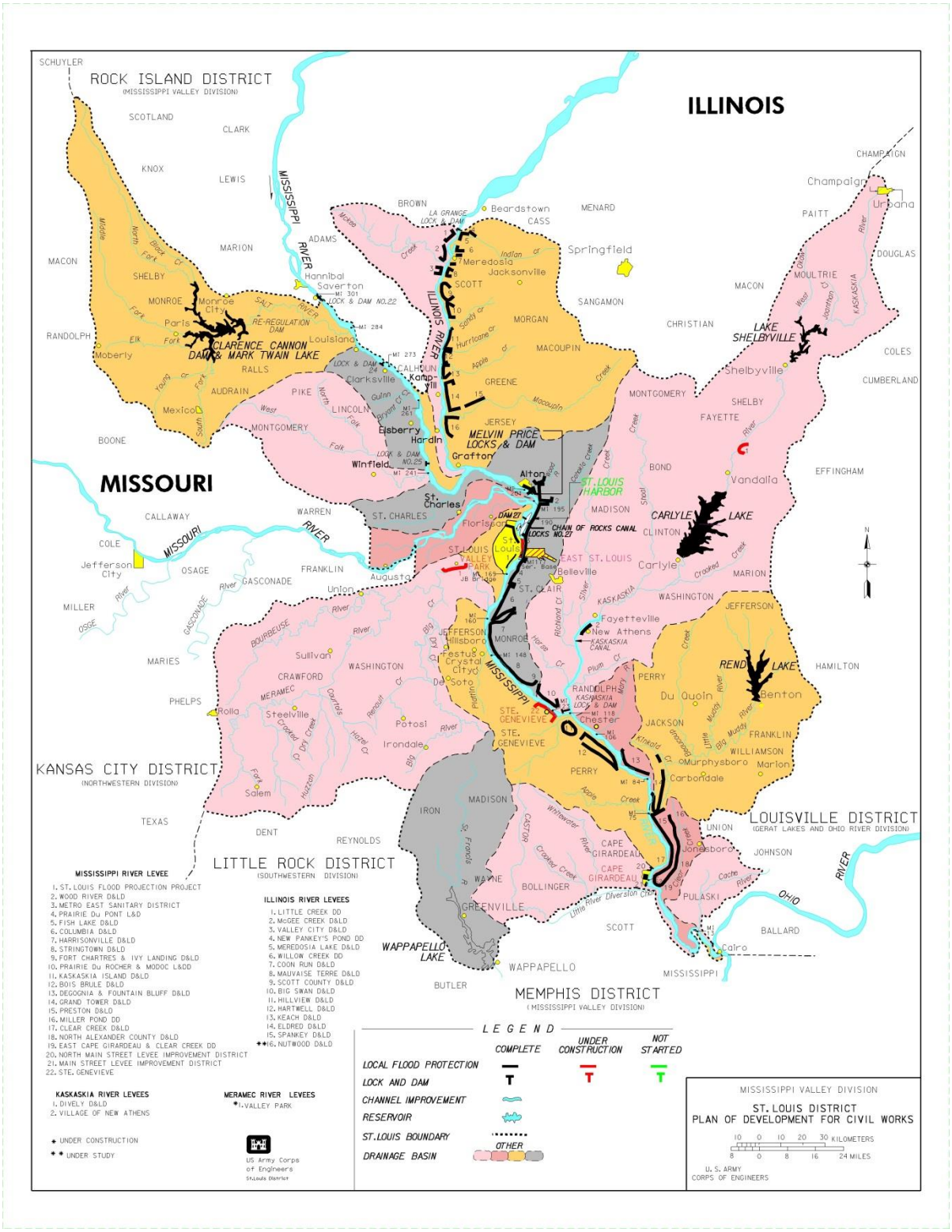
Topography base map is multidirectional
shaded-relief with 10X vertical exaggeration.


ROCK ISLAND DISTRICT
(MISSISSIPPI VALLEY DIVISION)
ILLINOIS
MISSOURI
KANSAS CITY DISTRICT
(NORTHWESTERN DIVISION)
LITTLE ROCK DISTRICT
(SOUTHWESTERN DIVISION)
MEMPHIS DISTRICT
(MISSISSIPPI VALLEY DIVISION)
LOUISVILLE DISTRICT
(GERAT LAKES AND OHIO RIVER DIVISION)
MISSISSIPPI RIVER
ILLINOIS RIVER
MISSOURI RIVER
OHIO RIVER
CLARENCE CANNON DAM & MARK TWAIN LAKE
MELVIN PRICE LOCKS & DAM
ST. LOUIS HARBOR
CHAIN OF ROCKS CANAL
LOCKS NO.27
CARLYLE LAKE
LAKE SHELBYVILLE
REND LAKE
WAPPAPELLO LAKE
MISSISSIPPI RIVER LEVEE
1. ST. LOUIS FLOOD PROJECTION PROJECT
2. WOOD RIVER D&LD
3. METRO EAST SANITARY DISTRICT
4. PRAIRIE Du PONT L&D
5. FISH LAKE D&LD
6. COLUMBIA D&LD
7. HARRISONVILLE D&LD
8. STRINGTOWN D&LD
9. FORT CHARTRES & IVY LANDING D&LD
10. PRAIRIE Du ROCHER & MODOC L&DD
11. KASKASKIA ISLAND D&LD
12. BOIS BRULE D&LD
13. DEGOGNIA & FOUNTAIN BLUFF D&LD
14. GRAND TOWER D&LD
15. PRESTON D&LD
16. MILLER POND DD
17. CLEAR CREEK D&LD
18. NORTH ALEXANDER COUNTY D&LD
19. EAST CAPE GIRARDEAU & CLEAR CREEK DD
20. NORTH MAIN STREET LEVEE IMPROVEMENT DISTRICT
21. MAIN STREET LEVEE IMPROVEMENT DISTRICT
22. STE. GENEVIEVE
ILLINOIS RIVER LEVEES
1. LITTLE CREEK DD
2. McGEE CREEK D&LD
3. VALLEY CITY D&LD
4. NEW PANKEY'S POND DD
5. MEREDOSIA LAKE D&LD
6. WILLOW CREEK DD
7. COON RUN D&LD
8. MAUVAISE TERRE D&LD
9. SCOTT COUNTY D&LD
10. BIG SWAN D&LD
11. HILLVIEW D&LD
12. HARTWELL D&LD
13. KEACH D&LD
14. ELDRED D&LD
15. SPANKEY D&LD
16. NUTWOOD D&LD
KASKASKIA RIVER LEVEES
1. DIVELY D&LD
2. VILLAGE OF NEW ATHENS
MERAMEC RIVER LEVEES
1. VALLEY PARK
UNDER CONSTRUCTION
UNDER STUDY
US Army Corps of Engineers
St.Louis District
LEGEND
COMPLETE
UNDER CONSTRUCTION
NOT STARTED
LOCAL FLOOD PROTECTION
LOCK AND DAM
CHANNEL IMPROVEMENT
RESERVOIR
ST.LOUIS BOUNDARY
OTHER
DRAINAGE BASIN
MISSISSIPPI VALLEY DIVISION
ST. LOUIS DISTRICT
PLAN OF DEVELOPMENT FOR CIVIL WORKS
KILOMETERS
MILES
U. S. ARMY
CORPS OF ENGINEERS

Levee Study

A review was completed to analyze the failures of the Illinois Levee's as a result of the 1993 and 2008 Flood events. Below are a list of the over topping failures, which was the only type of failure we were able to collect. Private levees may have had seepage or another failure, but are undocumented as they are not publicly accountable. The U.S. Army Corp of Engineers was able to provide the information regarding the 2008 flood events. Information pertaining to the 1993 flood event came from the publication "The 1993 Flood on the Mississippi River in Illinois" Illinois State Water Survey, Miscellaneous Publication 151; January 1994

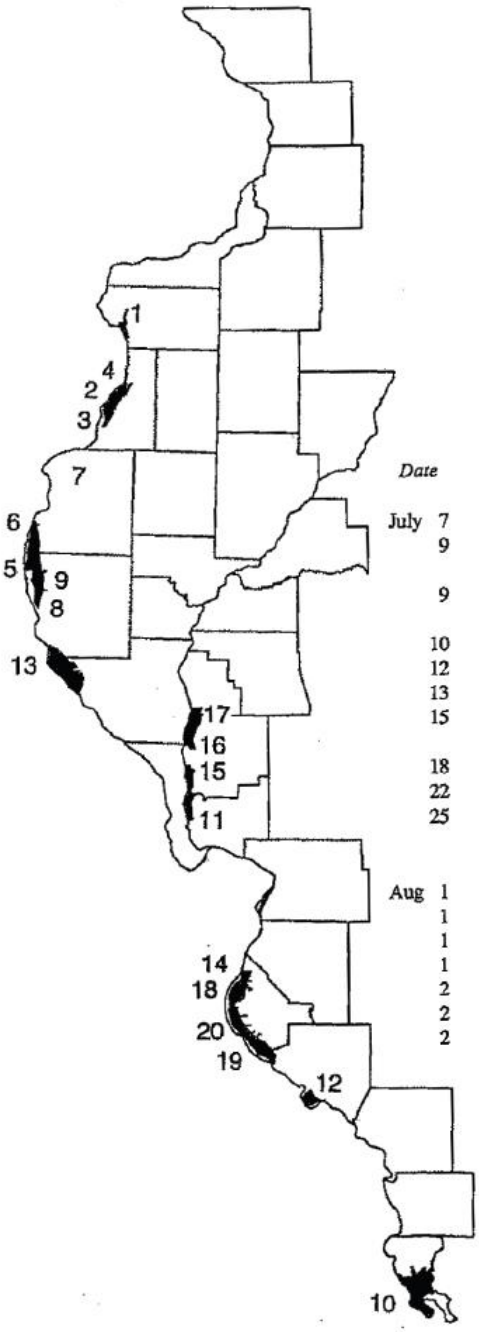


Table 3.10. Levee Breaches in Illinois

Date	Name of levee district(s)	Acres flooded	Location in figure 3.18
July 7	Keithsburg	1,260	1
9	Henderson County Levees #1, #2, and #3 (near Gulfport)	15,000	2, 3, 4
9	Lima Lake (near Meyer) and Hunt Districts	28,600	5, 6
10	Niota	1,000	7
12	Indian Grave (southern portion)	8,000	8
13	Indian Grave (northern portion)	10,000	9
15	Len Small (near Miller City and Fayville)	20,000	10
18	Nutwood (near Hardin)	11,000	11
22	Kaskaskia Island	14,000	12
25	Sny Island (northern portion) and Fall Creek	44,000	13
Aug 1	Columbia	13,000	14
1	Eldred (near Kampsville)	8,400	15
1	Hartwell (Greene County)	8,700	16
1	Hillview (Greene and Scott Counties)	12,300	17
2	Harrisonville and Ivy Landing	30,000	18
2	Stringtown	2,500	19
2	Fort Chartres and Ivy Landing	10,100	20

Note: This list does not include small levees or the breach of temporary levees built during the flood to protect a particular structure. None of the breaches in Iowa or Missouri are reported.

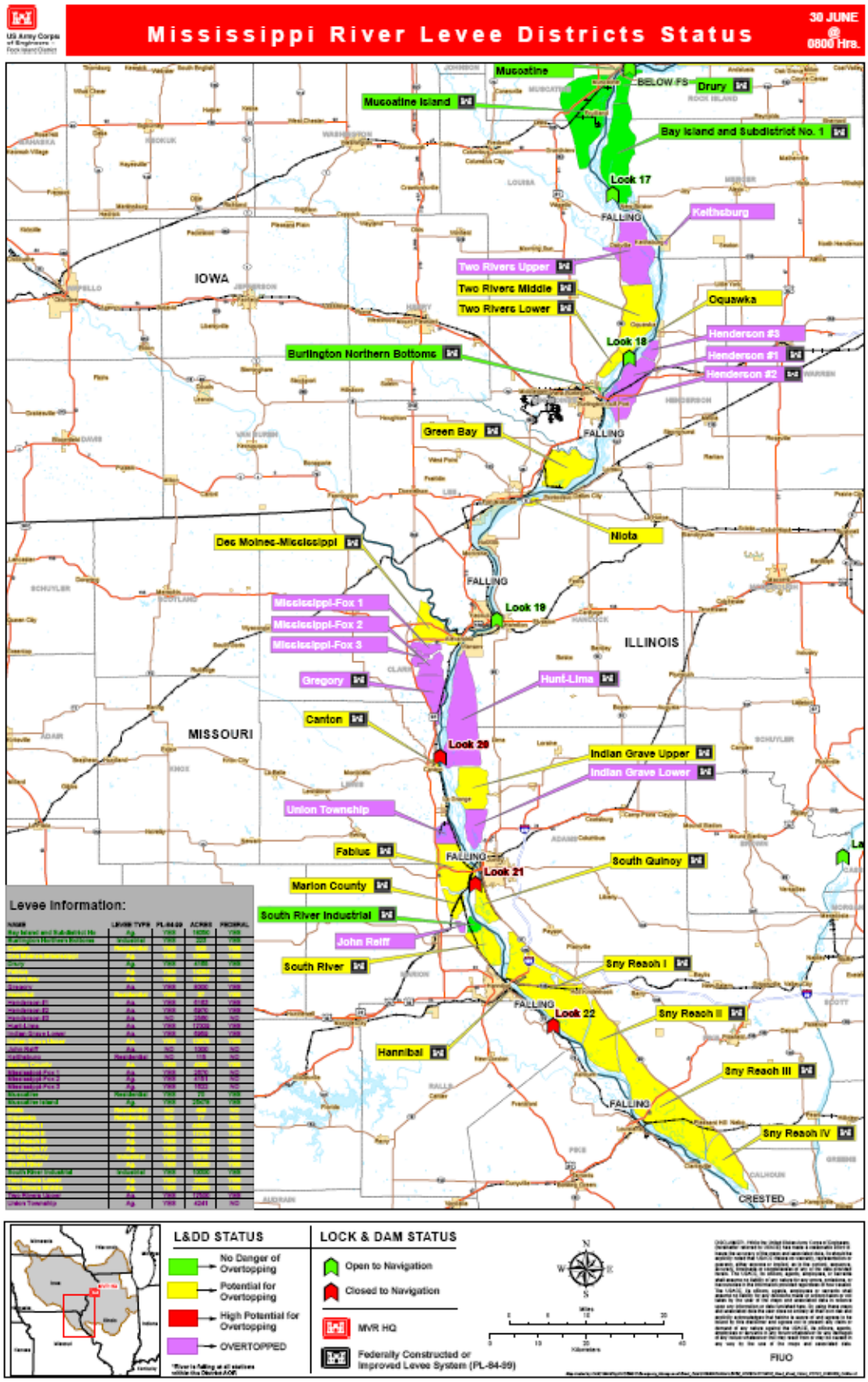
FLOOD DAMAGE REDUCTION PROJECTS THREATENED BY FLOOD WATER

Project Name	County	State	Fed[1]/Non-Fed[2]	PL 84-99 Eligible	Status	Date
MISSISSIPPI RIVER BASIN						
Oquawka	Henderson	IL	Non-Fed	No	Crested	17-Jun
Green Bay Levee District	Lee	IA	Fed	Yes	Crested	17-Jun
Niota Levee	Hancock	IL	Non-Fed	No	Crested	17-Jun
Des Moines-Mississippi Levee District	Clark	MO	Fed	Yes	Crested	17-Jun
Canton LFPP[3]	Lewis	MO	Fed	Yes	Crested	18-Jun
Indian Grave DD[4], Upper	Adams	IL	Fed	Yes	Crested	18-Jun
Fabius River DD	Marion & Lewis	MO	Fed	Yes	Crested	18-Jun
Marion County DD	Marion	MO	Fed	Yes	Crested	18-Jun
South Quincy Levee DD	Adams	IL	Fed	Yes	Crested	18-Jun
South River DD	Marion	MO	Fed	Yes	Crested	18-Jun
Hannibal LFPP	Marion	MO	Fed	Yes	Crested	18-Jun
Sny Levee DD (Reach I - IV)	Adams, Pike, & Calhoun	IL	Fed	Yes	Crested	18-Jun

OVERTOPPED/BREACHED LEVEES: ALL LEVEE DAMAGES WILL BE ASSESSED ONCE THE WATER RECEDES

ILLINOIS RIVER BASIN						
South Sangamon DD West	Linn	IL	Non-Fed	Yes	Overtopped	11-Jun
MISSISSIPPI RIVER BASIN						
Elkader	Clayton	IA	Non-Fed	Yes	Overtopped	9-Jun
Two Rivers, Upper [5]	Louisa	IA	Fed	Yes	Overtop breached	14-Jun
Keithsburg	Mercer	IL	Non-Fed	No	Overtopped	14-Jun
Henderson County DD No.3	Henderson	IL	Non-Fed	No	Breached	14-Jun
Henderson County DD No.1 & 2	Henderson	IL	Fed	Yes	Overtop breached	17-Jun
Mississippi River Fox DD No. 1,2, & 3	Clark	MO	Non-Fed	Yes	Overtop breached	15-Jun
Gregory DD	Clark	MO	Fed	Yes	Overtop breached	16-Jun
Hunt & Lima DD	Adams	IL	Fed	Yes	Overtop breached	18-Jun
Indian Grave DD, Lower	Adams	IL	Fed	Yes	Overtop breached	18-Jun
Union Township DD (LaGrange)	Lewis	MO	Non-Fed	Yes	Overtop breached	16-Jun
John Reiff	Marion	MO	Non-Fed	No	Overtopped	16-Jun
IOWA AND CEDAR RIVER BASIN						
Cedar Rapids	Linn	IA	Non-Fed	No	Overtopped	11-Jun
Columbus Junction	Louisa	IA	Non-Fed	No	RR[6] embankment Failed	14-Jun
Louisa County DD No. 11	Louisa	IA	Non-Fed	Yes	Overtopped	13-Jun
DES MOINES RIVER BASIN						
Birdland Park	Polk	IA	Non-Fed	No	Breached	14-Jun

1 - Federal - Federal constructed locally maintained
2 - Non-Federal - Sponsor constructed locally maintained
3 - Local Flood Protection Project
4 - DD-Drainage District
5 - Iowa River -Flint Creek Levee District no. 16
6 - RR - Railroad


US Army Corps of Engineers
Mississippi River Levee Districts Status
30 JUNE @ 0800 Hrs.
Muscatine
BELOW FS
Drury
Muscatine Island
Bay Island and Subdistrict No. 1
Lock 17
FALLING
Keithsburg
Two Rivers Upper
Two Rivers Middle
Two Rivers Lower
Oquawka
IOWA
Henderson #3
Lock 18
Henderson #1
Henderson #2
Burlington Northern Bottoms
Green Bay
Nauvoo
Dec Moines-Mississippi
Mississippi-Fox 1
Mississippi-Fox 2
Mississippi-Fox 3
Lock 19
ILLINOIS
Gregory
Hunt-Lima
Canton
MISSOURI
Lock 20
Indian Grave Upper
Indian Grave Lower
Union Township
Fabius
Lock 21
South Quincy
Marion County
South River Industrial
John Reiff
South River
Sny Reach I
Lock 22
Sny Reach II
Hannibal
Sny Reach III
Sny Reach IV
CRESTED
Levee Information:
L&DD STATUS
No Danger of Overtopping
Potential for Overtopping
High Potential for Overtopping
OVERTOPPED
LOCK & DAM STATUS
Open to Navigation
Closed to Navigation
MVR HQ
Federally Constructed or Improved Levee System (PL-84-99)
FIUO

OVERTOPPED LEVEES IN THE ST. LOUIS DISTRICT				
2008 FLOOD March 18th-May 21st				
LEVEE SYSTEM	ACRES PROTECTED	DESIGN YEARS	LENGTH (MILES)	
Miller Pond	4,300	50		2.8
Vandalia	12,000	5		16.5
OVERTOPPED LEVEES BY FLOOD FIGHT AREAS IN ST. LOUIS DISTRICT				
2008 FLOOD June 10th-July 18th				
LEVEE SYSTEM	ACRES PROTECTED	DESIGN YEARS	LENGTH (MILES)	
ELSBERRY AREA				
Pike Grain #3	250	10		4.1
Pike Grain #4	1000	30		5.2
Kissinger	2,570.00	30		6.8
Elsberry	23,481.00	20		23.8
Kings Lake	3,300.00	14		7.8
Sandy Creek	944	14		2.5
Foley	1,214.00	18		3.8
Cap Au Gris	3,491.00	14		7
Brevator	1,841.00	14		5.7
Winfield (Pin Oaks)	1,550.00	14		5
ST. CHARLES AREA				
Columbia Bottoms	4,000.00	5		8
Elm Point	2,277.00	25		6.3

The Non-Federal Flood Control Works Inspection Guide (ER 500-1-1) provides further details on the USACE levee rating system. The following table lists unacceptable and inactive levees in Illinois. The Non-Federal Flood Control Works Inspection Guide (ER 500-1-1) provides further details on the USACE levee rating system. . *(Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale)*

PL-84-99 levees in Illinois that have an unacceptable or inactive rating

Levee District Name	County	River or Stream	Protected Area (Acres)	Protection Level (Years)	Recent Inspection Rating	Inspection Date
Metro East D&LD	Madison	Mississippi River	85,977	500	Unacceptable	5/22/2010
East Peoria Sanitary District	Tazewell	Illinois River	20	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	355	100	Unacceptable	4/11/2012
East Peoria D&LD	Tazewell	Illinois River	17	100	Unacceptable	4/11/2012
East Peoria D&LD	Tazewell	Illinois River	1,049	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	37	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	93	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	94	100	Unacceptable	4/11/2012
Shawneetown LFPP	Gallatin	Ohio River	9,45	100	Unacceptable	12/13/2005
Brookport	Massac	Ohio River	1,185	100	Unacceptable	6/3/2010
Mississippi & Ohio Rivers LS	Alexander	Mississippi and Ohio	16,584	100	Unacceptable	4/16/2012
DeKalb LFP: LDB South Branch	DeKalb	Kishwaukee	183	100	Inactive	Not Available
East Peoria Sanitary District	Peoria	Illinois River	81	100	Unacceptable	4/11/2012
Penny Slough D&LD	Whiteside	Rock River	9,495	50	Unacceptable	4/3/2012
Hennepin D&LD	Putnam	Illinois River	2,612	50	Unacceptable	11/19/2001
Pekin and La Marsch D&LD	Peoria	Illinois River	2,843	50	Inactive	Not Available
Degognia \ Grand Tower	Jackson	Mississippi River	56,777	50	Unacceptable	7/14/2010
Mason and Menard D&LD	Mason	Sangamon River	5,885	50	Inactive	Not Available
Streator, IL Levee	La Salle	Vermilion River	27	50	Unacceptable	10/21/2008
Page Park Dam North Branch	Winnebago	Kent Creek	751	50	Inactive	Not Available
Cincinnati L&DD	Tazewell	Mackinaw	2,004	10	Inactive	Not Available

Table Supplied by: Illinois Statewide Flood Assessment 2013- Natural Hazard Research and Mitigation Group (NHRMG) at Southern Illinois University, Carbondale

The following table provides Illinois levee information utilized in the HAZUS analysis.

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Carroll	Mississippi River	1993	7.8	3300	50	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Mississippi River	1984	12.0	9586	200	Yes	Yes	Minimally Acceptable	4/22/2010	Periodic
Whiteside	Mississippi River	1977	3.4	10044	100	Yes	Yes	Minimally Acceptable	3/12/2012	Periodic
Whiteside	Rock River	Not Available	0.4	100	20	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	Not Available	7.6	5800	10	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	Not Available	1.7	770	5	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	1940	9.2	9495	50	Yes	No	Unacceptable	4/3/2012	Routine
Rock Island	Rock River	Not Available	7.6	5007	50	Yes	No	Inactive	4/21/2011	Routine
Rock Island	Mississippi River	1984	2.5	1193	200	Yes	Yes	Minimally Acceptable	5/13/2010	Periodic
Rock Island	Mississippi River	Not Available	0.9	822	Not Available	No	No	Not Applicable	Not Applicable	N/A
Rock Island	Mississippi River	1973	3.8	863	200	Yes	Yes	Minimally Acceptable	5/11/2010	Periodic
Rock Island	Rock River	1988	10.8	1147	200	Yes	Yes	Minimally Acceptable	4/2/2012	Periodic
Rock Island	Rock River	1988	10.8	811	200	Yes	Yes	Minimally Acceptable	4/2/2012	Periodic
Rock Island	Mississippi River	1969	1.6	63	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Rock Island	Mississippi River	1969	1.6	113	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Rock Island	Mississippi	1963	9.6	5110	50	Yes	No	Minimally	5/10/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Rock Island	River Mississippi River	1989	1.6	130	2	Yes	No	Acceptable Minimally Acceptable	Not Available	Not Available
Putnam	Illinois River	1940	5.9	2612	50	Yes	No	Unacceptable	11/19/2001	Routine
Mercer	Mississippi River	1966	19.9	24989	50	Yes	No	Minimally Acceptable	5/13/2010	Routine
Mercer	Mississippi River	1969	0.9	115	Not Available	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	Not Available	0.0	77	Not Available	No	No	Not Applicable	Not Applicable	N/A
WOODFORD	Illinois River	Not Available	1.6	420	10	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	1968	6.6	6163	Not Available	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	1968	11.3	17998	50	Yes	No	Not Available	Not Available	Not Available
Peoria	Illinois River	Not Available	1.0	125	10	No	No	Not Applicable	Not Applicable	N/A
Tazewell	Illinois River	1945	9.5	20	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	9.5	355	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	3.2	17	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	0.0	1049	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	9.5	37	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois	1945	9.5	93	100	Yes	No	Unacceptable	4/11/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Tazewell	River Illinois River	1945	9.5	94	100	Yes	No	Unacceptable	4/11/2012	Periodic
Peoria	Illinois River	Not Available	1.2	57	100	Yes	No	Minimally Acceptable	10/5/2007	Routine
Peoria	Illinois River	Not Available	2.6	245	10	No	No	Not Applicable	Not Applicable	N/A
Peoria	Illinois River	1954	7.1	2843	50	Yes	No	Inactive	Not Available	Not Available
Henderson	Mississippi River	Not Available	0.0	458	Not Available	No	No	Not Applicable	Not Applicable	N/A
Tazewell	Illinois River	1941	16.0	13010	50	Yes	No	Acceptable	Not Available	Not Available
Peoria	Illinois River	1941	10.8	4866	50	Yes	No	Inactive	Not Available	N/A
Fulton	Illinois River	1941	8.7	2961	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Illinois River	1941	7.0	3174	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Mason	Illinois River	1993	3.8	1192	10	No	No	Not Applicable	Not Available	N/A
Fulton	Illinois River	1920	12.3	5911	50	Yes	No	Acceptable	Not Available	Not Available
Fulton	Illinois River	1949	4.5	10553	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Hancock	Mississippi River	1972	30.3	31406	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Illinois River	1939	4.7	1782	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Schuyler	Illinois	1943	6.8	3921	50	Yes	No	Unacceptable	5/12/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Schuyler	River Illinois River	Not Available	4.8	1200	Not Available	No	No	Not Applicable	Not Applicable	N/A
Adams	Mississippi River	1971	29.0	12638	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Schuyler	Illinois River	1954	13.1	6318	100	Yes	Yes	Minimally Acceptable	5/8/2012	Periodic
Schuyler	Illinois River	1941	8.6	5559	50	Yes	No	Acceptable	12/15/2010	Routine
Cass	Illinois River	1967	11.1	21923	100	Yes	Yes	Minimally Acceptable	7/22/2010	Periodic
Adams	Mississippi River	1971	29.0	6859	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Morgan	Illinois River	Not Available	10.8	16119	30	Yes	No	Minimally Acceptable	6/15/2010	Periodic
Brown	Illinois River	Not Available	5.8	1646	12	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Brown	Illinois River	Not Available	14.6	12254	100	Yes	Yes	Minimally Acceptable	12/1/2007	Periodic
Adams	Mississippi River	Not Available	8.8	5515	500	Yes	Yes	Acceptable	Not Available	Not Available
Morgan	Illinois River	Not Available	7.0	9062	10	Yes	No	Minimally Acceptable	10/9/2010	Periodic
Pike	Mississippi River	1971	0.0	45261	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Scott	Illinois River	Not Available	6.4	5481	40	Yes	No	Minimally Acceptable	1/4/2011	Periodic
Pike	Illinois River	Not Available	8.2	4772	40	Yes	No	Minimally Acceptable	1/5/2011	Periodic
Scott	Illinois	Not	1.9	693	40	YES	No	Minimally	8/25/2011	Routine

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River	Available						Acceptable		
Scott	Illinois River	Not Available	17.0	11125	40	Yes	No	Minimally Acceptable	2/11/2011	Periodic
Pike	Mississippi River	1971		896	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Pike	Mississippi River	1971		17264	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Scott	Illinois River	Not Available	11.3	13607	20	Yes	No	Minimally Acceptable	8/26/2011	Routine
Pike	Mississippi River	1971		43296	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Greene	Illinois River	Not Available	12.8	13446	20	Yes	No	Minimally Acceptable	8/24/2011	Routine
Greene	Illinois River	Not Available	12.2	9795	20	Yes	No	Minimally Acceptable	10/2/2010	Periodic
CALHOUN	Mississippi River	1971		14037	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Greene	Illinois River	Not Available	12.4	9362	25	Yes	No	Minimally Acceptable	10/9/2010	Periodic
Greene	Illinois River	Not Available	11.8	9455	20	Yes	No	Minimally Acceptable	12/9/2010	Periodic
JERSEY	Illinois River	Not Available	12.3	11048	20	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Madison	Mississippi River	Not Available	20.8	428	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi River	Not Available	20.8	10688	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi River	Not Available	20.8	1640	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi	Not	19.8	85977	500	Yes	Yes	Unacceptable	5/22/2010	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Madison	River Mississippi River	Available Not Available	11.3	1999	10	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Madison	Mississippi River	Not Available	2.4	800	10	No	No	Not Applicable	Not Applicable	N/A
St. Clair	Mississippi River	Not Available	10.3	12903	500	Yes	Yes	Minimally Acceptable	10/9/2009	Periodic
Monroe	Mississippi River	Not Available	20.1	13806	50	Yes	No	Minimally Acceptable	1/30/2011	Periodic
Monroe	Mississippi River	Not Available	21.4	45938	50	Yes	No	Minimally Acceptable	11/2/2010	Periodic
Randolph	Mississippi River	Not Available	16.5	16151	100	Yes	Yes	Minimally Acceptable	11/3/2010	Periodic
Randolph	Mississippi River	Not Available	14.8	9241	50	Yes	No	Minimally Acceptable	8/12/2011	Routine
Jackson	Mississippi River	Not Available	19.4	56777	50	Yes	No	Unacceptable	7/14/2010	Periodic
Union	Mississippi River	Not Available	14.6	16200	50	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Fulton	Spoon River	1983	3.2	1290	50	Yes	No	Acceptable	3/24/2012	Routine
Fulton	Illinois and Spoon R	1930	5.5	1233	20	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Spoon River	Not Available	0.0	422	Not Available	Yes	No	Unacceptable	3/5/2009	Routine
Fulton	Spoon River	1955	6.1	2213	50	Yes	No	Minimally Acceptable	3/1/2011	Routine
Fulton	Spoon River	1954	3.7	980	10	Yes	No	Acceptable	3/7/2011	Routine
Mason	Sangamon	1939	14.5	5885	50	Yes	No	Inactive	Not	Not

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River								Available	Available
Menard	Sangamon River	1939	7.4	2729	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Menard	Sangamon River	Not Available	0.0	563	Not Available	Yes	No	Minimally Acceptable	1/13/2010	Routine
Mason	Sangamon River	1941	8.3	7448	50	Yes	No	Acceptable	Not Available	Not Available
Cass	Sangamon River	Not Available	0.0	4082	Not Available	Yes	No	Inactive	Not Available	N/A
Cass	Sangamon River	1895	8.0	2561	20	Yes	No	Minimally Acceptable	10/29/2009	Routine
Cass	Sangamon River	1975	6.1	3811	50	Yes	No	Minimally Acceptable	5/22/2009	Routine
Cass	Sangamon River	1948	8.5	13954	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Spoon River	1960	2.4	290	10	Yes	No	Minimally Acceptable	3/14/2011	Routine
Stark	Spoon River	Not Available	0.7	152	10	Yes	No	Minimally Acceptable	10/31/2007	Routine
Fayette	Kaskaskia River	Not Available	0.0	1398	Not Available	Yes	No	Minimally Acceptable	5/26/2010	Periodic
Fayette	Kaskaskia River	Not Available	0.0	11978	Not Available	Yes	No	Not Available	Not Available	Not Available
Clinton	Kaskaskia River	Not Available	0.0	2932	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Kaskaskia River	Not Available	0.0	1277	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Kaskaskia River	Not Available	0.0	3443	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Shoal Creek	Not	0.0	1403	Not	Yes	No	Minimally	9/22/2011	Routine

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
		Available			Available			Acceptable		
St. Clair	Kaskaskia River	Not Available	0.0	146	100	Yes	Yes	Minimally Acceptable	9/14/2011	Periodic
Jasper	Embarrass River	Not Available	0.0	2078	Not Available	Yes	No	Minimally Acceptable	9/18/2007	Routine
Lawrence	Wabash River	Not Available	0.0	41385	Not Available	Yes	No	Minimally Acceptable	9/18/2007	Routine
Lawrence	Wabash River	Not Available	0.0	6157	Not Available	Yes	No	Minimally Acceptable	4/5/2012	Periodic
Wabash	Wabash River	Not Available	0.0	550	100	Yes	Yes	Minimally Acceptable	7/11/2012	Periodic
Wabash	Wabash River	Not Available	0.0	4823	Not Available	Yes	No	Minimally Acceptable	4/6/2012	Periodic
Gallatin	Ohio River	Not Available	0.0	945	100	Yes	No	Unacceptable	12/13/2005	Routine
Saline	Saline River	Not Available	0.0	3903	100	Yes	Yes	Minimally Acceptable	9/12/2012	Routine
Hardin	Ohio River	Not Available	0.0	263	100	Yes	Yes	Minimally Acceptable	2/6/2012	Periodic
Massac	Ohio River	Not Available	0.0	1185	100	Yes	Yes	Unacceptable	6/3/2010	Periodic
Massac	Bay Creek Ditch	Not Available	0.0	6655	50	Yes	No	Minimally Acceptable	2/7/2012	Routine
Pulaski	Cache River	Not Available	0.0	2147	Not Available	Yes	No	Unacceptable	4/22/2010	Periodic
Alexander	Mississippi River	Not Available	0.0	16605	15	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Alexander	Mississippi and Ohio	Not Available	0.0	16584	100	Yes	Yes	Unacceptable	4/16/2012	Routine
La Salle	Illinois	Not	0.0	63	Not	Yes	No	Acceptable	Not	Not

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River	Available			Available				Available	Available
La Salle	Vermilion River	Not Available	0.4	27	50	Yes	No	Unacceptable	10/21/2008	Routine
Winnebago	Kent Creek	Not Available	0.0	751	50	Yes	No	Inactive	Not Available	Not Available
Winnebago	South Branch Kent Creek	1988	0.0	3605	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Winnebago	Kent Creek	Not Available	0.0	637	50	Yes	No	Acceptable	Not Available	Not Available
Winnebago	Keith Creek	Not Available	0.0	210	Not Available	Yes	No	Unacceptable	11/19/2003	Routine
Lake	Des Plaines River	Not Available	0.0	65	Not Available	Yes	No	Minimally Acceptable	4/26/2010	Periodic
DeKalb	Kishwaukee	1958	3.2	92	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
DeKalb	Kishwaukee	1958	3.2	183	100	Yes	Yes	Inactive	Not Available	Not Available
Peoria	Illinois River	Not Available	9.5	81	100	Yes	Yes	Unacceptable	4/11/2012	Periodic
Jo Daviess	Mississippi River	Not Available	0.0	40	Not Available	No	No	Not Applicable	Not Applicable	N/A
Joe Daviess	Galena River	1951	1.6	30	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Joe Daviess	Galena River	1951	0.0	39	100	Yes	Yes	Not Available	Not Available	Not Available
Rock Island	Slough Mill Creek	Not Available	0.0	85	100	Yes	Yes	Not Available	Not Available	Not Available
Henderson	Mississippi	Not Available	0.0	686	Not Available	Yes	No	Not Available	Not Available	Not Available

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Pike	Mississippi	Not Available	0.0	2461	Not Available	Yes	No	Minimally Acceptable	3/17/2011	Periodic
Jersey	Illinois River	Not Available	0.0	931	Not Available	Yes	No	Minimally Acceptable	12/17/2010	Periodic
Greene	Illinois	Not Available	0.0	725	Not Available	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Greene	Illinois	Not Available	0.0	275	Not Available	Yes	No	Acceptable	12/1/2007	Not Available
Morgan	Illinois	Not Available	0.0	1600	Not Available	Yes	No	Minimally Acceptable	11/2/2010	Periodic
Tazewell	Mackinaw	Not Available	4.6	2004	10	Yes	No	Inactive	Not Available	Routine
Tazewell	Mackinaw	Not Available	3.4	1639	100	Yes	Yes	Minimally Acceptable	12/7/2010	Routine
Pope	Ohio River	Not Available	0.0	74	100	Yes	Yes	Minimally Acceptable	2/8/2012	Routine

The Illinois Statewide Flood Hazard Assessment and Hazus-MH estimated there to be $22.3 billion in building-related infrastructure in Illinois behind levees accredited by FEMA as protecting the 100-year level or higher. The majority of this exposure (85%) is located within three counties along the Mississippi River: Madison County ($13.42 billion in exposure), Rock Island County ($3.84 billion), and St. Clair ($1.71 billion). In the event of levee failure the estimated building-related-flood losses on 100-year Illinois floodplains would increase from $18.03 billion to $21.44 billion (19%). The majority of the increase in flood losses (77%) is located in within three counties along the Mississippi River: Madison County ($1.1 billion increase in losses from $0.23 billion to $1.33 billion), St. Clair ($0.98 billion increase in losses from $0.20 billion to $1.18 billion), and Rock Island County ($0.58 billion increase from $0.34 billion to $0.92 billion).

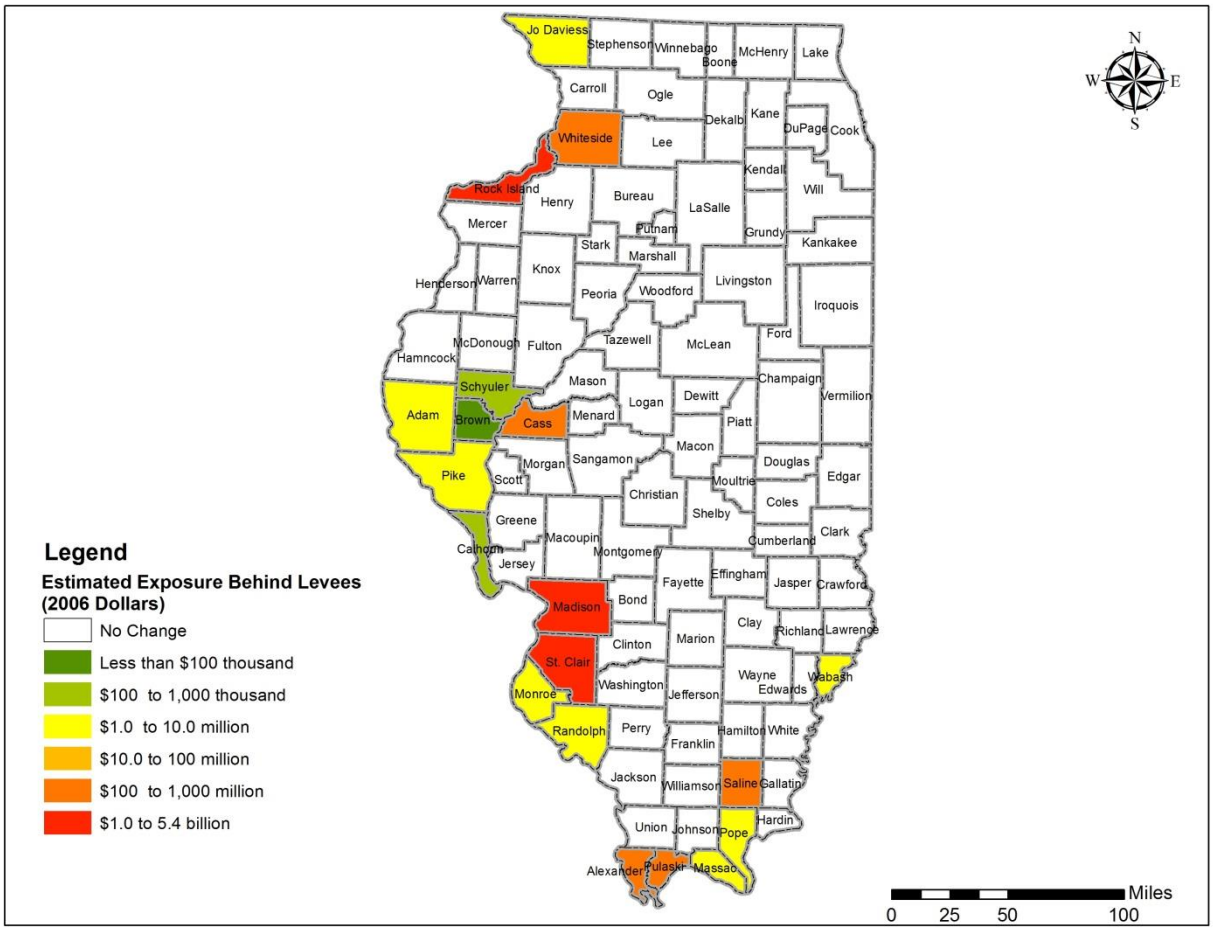


Figure 5 - Estimated flood exposure in levee-protected areas by county.

The following table depicts loss estimates established in the Statewide HAZUS analysis for levee failure.

Loss Estimation according to Hazus-MH for Levee Failure

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Alexander	1	106710	473539	0.23	0.74	4.75	1.00	1.74	3.38	High
Peoria	2	1007400	3391926	0.30	1.00	-1.56	0.47	1.47	2.32	High
White	3	70270	355209	0.20	0.64	2.19	0.78	1.42	2.14	High
Rock Island	4	920790	3607772	0.26	0.85	-0.63	0.55	1.40	2.05	High
Lee	5	161510	730949	0.22	0.73	-0.53	0.56	1.29	1.61	High
Hardin	6	12680	113683	0.11	0.33	3.91	0.93	1.26	1.51	High
Pulaski	7	45770	278678	0.16	0.52	1.59	0.73	1.25	1.47	Elevated
Pope	8	28030	274439	0.10	0.30	4.11	0.95	1.25	1.45	Elevated
Jackson	9	154400	998106	0.15	0.49	1.69	0.74	1.23	1.38	Elevated
Massac	10	59880	353205	0.17	0.54	0.87	0.67	1.21	1.31	Elevated
Cass	11	111560	551835	0.20	0.66	-0.63	0.55	1.21	1.30	Elevated
Whiteside	12	211780	1107594	0.19	0.62	-0.40	0.57	1.19	1.23	Elevated
LaSalle	13	281280	2060057	0.14	0.42	1.92	0.76	1.18	1.20	Elevated
Gallatin	14	24840	169928	0.15	0.46	1.44	0.72	1.18	1.18	Elevated
Saline	15	110930	833748	0.13	0.41	1.68	0.74	1.15	1.07	Elevated
Pike	16	32140	231988	0.14	0.43	1.43	0.72	1.15	1.07	Elevated
Johnson	17	32240	275579	0.12	0.35	2.26	0.79	1.14	1.04	Elevated
Henderson	18	30510	184335	0.17	0.53	0.06	0.61	1.14	1.02	Elevated
Lawrence	19	56700	336329	0.17	0.54	-0.23	0.58	1.12	0.95	Elevated
Union	20	70000	474138	0.15	0.46	0.53	0.65	1.11	0.93	Elevated
Perry	21	35330	272062	0.13	0.40	1.32	0.71	1.11	0.91	Elevated
Wabash	22	26040	169552	0.15	0.48	-0.14	0.59	1.07	0.78	Elevated
Carroll	23	57950	409575	0.14	0.44	0.32	0.63	1.07	0.76	Elevated
Stephenson	24	129770	851978	0.15	0.48	-0.17	0.59	1.07	0.76	Elevated
Franklin	25	40530	441770	0.09	0.26	2.24	0.79	1.05	0.69	Elevated
Adam	26	145230	993649	0.15	0.46	-0.13	0.59	1.05	0.67	Elevated
Randolph	27	76190	631635	0.12	0.36	0.88	0.67	1.03	0.63	Elevated
Wayne	28	23770	170222	0.14	0.43	-0.07	0.59	1.02	0.58	Elevated

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Morgan	29	85850	792258	0.11	0.32	0.87	0.67	0.99	0.45	Average
St. Clair	30	1184080	7511279	0.16	0.50	-1.36	0.49	0.99	0.45	Average
Marion	31	53940	572355	0.09	0.27	1.15	0.70	0.97	0.37	Average
Tazewell	32	454300	2661830	0.17	0.54	-2.25	0.41	0.95	0.32	Average
Vermilion	33	123700	1243312	0.10	0.29	0.65	0.66	0.95	0.29	Average
Calhoun	34	27730	252997	0.11	0.32	0.09	0.61	0.93	0.24	Average
Dewitt	35	41170	302236	0.14	0.42	-1.07	0.51	0.93	0.22	Average
Mason	36	18420	166071	0.11	0.33	-0.02	0.60	0.93	0.22	Average
Richland	37	32620	302456	0.11	0.32	0.11	0.61	0.93	0.21	Average
Iroquois	38	87070	700991	0.12	0.38	-0.65	0.55	0.93	0.21	Average
Knox	39	37840	515381	0.07	0.19	1.54	0.73	0.92	0.20	Average
Madison	40	1327770	8271525	0.16	0.51	-2.23	0.41	0.92	0.17	Average
Clay	41	15870	141698	0.11	0.33	-0.25	0.58	0.91	0.15	Average
Macon	42	212940	1925620	0.11	0.33	-0.24	0.58	0.91	0.13	Average
Bureau	43	63980	574753	0.11	0.33	-0.40	0.57	0.90	0.11	Average
Moultrie	44	34240	327897	0.10	0.30	-0.12	0.59	0.89	0.09	Average
Brown	45	2620	113197	0.02	0.01	3.35	0.88	0.89	0.07	Average
Clark	46	21010	198880	0.11	0.31	-0.29	0.58	0.89	0.06	Average
Jo Daviess	47	106020	868841	0.12	0.37	-0.93	0.52	0.89	0.06	Average
Kendall	102	104850	1199314	0.09	0.24	-7.15	0.00	0.24	-2.45	Low
Williamson	48	97300	1142675	0.09	0.23	0.33	0.63	0.86	-0.03	Average
Marshall	49	27760	273602	0.10	0.29	-0.34	0.57	0.86	-0.03	Average
Schuyler	50	3830	61423	0.06	0.15	1.29	0.71	0.86	-0.04	Average
Clinton	51	125260	962267	0.13	0.40	-1.64	0.46	0.86	-0.06	Average
Edwards	52	5670	49066	0.12	0.34	-1.09	0.51	0.85	-0.07	Average
McDonough	53	33700	429648	0.08	0.21	0.44	0.64	0.85	-0.08	Average
Scott	54	13410	104179	0.13	0.39	-1.81	0.45	0.84	-0.12	Average
Coles	55	63890	648722	0.10	0.28	-0.60	0.55	0.83	-0.15	Average
Greene	56	9120	136790	0.07	0.17	0.75	0.66	0.83	-0.17	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Jefferson	57	40080	580847	0.07	0.18	0.61	0.65	0.83	-0.18	Average
Stark	58	8350	80955	0.10	0.30	-0.92	0.52	0.82	-0.20	Average
Logan	59	33330	413402	0.08	0.22	-0.06	0.60	0.82	-0.21	Average
Fayette	60	16670	253200	0.07	0.17	0.53	0.65	0.82	-0.22	Average
Livingston	61	74040	819864	0.09	0.25	-0.53	0.56	0.81	-0.23	Average
Christian	62	26400	375896	0.07	0.18	0.35	0.63	0.81	-0.24	Average
Crawford	63	21050	284808	0.07	0.19	0.09	0.61	0.80	-0.26	Average
Douglas	64	50080	470359	0.11	0.31	-1.27	0.49	0.80	-0.27	Average
Montgomery	65	11950	252162	0.05	0.10	1.23	0.70	0.80	-0.29	Average
Jersey	66	36090	328308	0.11	0.32	-1.71	0.46	0.78	-0.34	Average
Kankakee	67	198930	2071666	0.10	0.27	-1.23	0.50	0.77	-0.38	Average
Hancock	68	28950	379773	0.08	0.20	-0.38	0.57	0.77	-0.39	Average
Edgar	69	11570	184342	0.06	0.15	0.09	0.61	0.76	-0.42	Average
Sangamon	70	309090	2685773	0.12	0.34	-2.12	0.42	0.76	-0.42	Average
Hamilton	71	4030	135221	0.03	0.03	1.32	0.71	0.74	-0.49	Average
Henry	72	57330	614438	0.09	0.26	-1.59	0.47	0.73	-0.54	Average
Menard	73	22730	215605	0.11	0.31	-2.12	0.42	0.73	-0.56	Average
Bond	74	20510	267956	0.08	0.20	-0.95	0.52	0.72	-0.58	Average
Jasper	75	12540	173289	0.07	0.19	-0.90	0.53	0.72	-0.60	Low
Cook	76	3273790	43728088	0.07	0.20	-1.01	0.52	0.72	-0.60	Low
Shelby	77	13180	242679	0.05	0.12	-0.17	0.59	0.71	-0.62	Low
Winnebago	78	467060	5588832	0.08	0.23	-1.45	0.48	0.71	-0.63	Low
Ogle	79	126530	1252250	0.10	0.29	-2.26	0.41	0.70	-0.66	Low
Monroe	80	95220	701150	0.14	0.42	-3.83	0.28	0.70	-0.68	Low
Ford	81	2390	50666	0.05	0.10	-0.02	0.60	0.70	-0.68	Low
Warren	82	6680	141830	0.05	0.10	-0.04	0.60	0.70	-0.68	Low
Macoupin	83	13700	215085	0.06	0.16	-0.72	0.54	0.70	-0.68	Low
Effingham	84	55360	622949	0.09	0.25	-1.97	0.44	0.69	-0.72	Low
Washington	85	14610	214510	0.07	0.17	-1.13	0.51	0.68	-0.73	Low

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Fulton	86	9250	459592	0.02	0.00	0.96	0.68	0.68	-0.75	Low
Champaign	87	151490	1960497	0.08	0.21	-1.70	0.46	0.67	-0.80	Low
Mercer	88	15760	238450	0.07	0.17	-1.56	0.47	0.64	-0.92	Low
Grundy	89	121980	1008513	0.12	0.36	-3.96	0.27	0.63	-0.93	Low
Cumberland	90	10390	205235	0.05	0.11	-1.05	0.51	0.62	-0.98	Low
Woodford	91	61660	579495	0.11	0.31	-3.65	0.29	0.60	-1.05	Low
Piatt	92	30900	368835	0.08	0.23	-2.70	0.37	0.60	-1.06	Low
Putnam	93	7350	136742	0.05	0.12	-2.23	0.41	0.53	-1.32	Low
DeKalb	94	103050	1494590	0.07	0.18	-3.01	0.35	0.53	-1.34	Low
McLean	95	131850	2137957	0.06	0.15	-3.70	0.29	0.44	-1.68	Low
Boone	96	61430	780967	0.08	0.21	-4.51	0.22	0.43	-1.71	Low
Kane	97	702320	8717526	0.08	0.22	-5.06	0.18	0.40	-1.84	Low
Will	98	1399440	15129593	0.09	0.26	-5.73	0.12	0.38	-1.91	Low
Lake	99	2090820	22539796	0.09	0.26	-6.00	0.10	0.36	-1.98	Low
DuPage	100	2199620	23666320	0.09	0.26	-6.36	0.07	0.33	-2.10	Low
McHenry	101	517800	7140216	0.07	0.19	-6.16	0.08	0.27	-2.34	Low

E. Severe Winter Storms

Description

When you hear the term "severe winter storm warning" freezing temperatures, heavy snowfall or freezing rain comes to mind. There are three categories of winter storms:

Blizzard: This is the most dangerous of all winter storms. A blizzard is defined as falling or blowing snow with winds of at least 35 miles per hour, reducing visibility to less than one-quarter mile.

Heavy Snow Storm: Will produce six inches or more of snow in 12 hours or less, or eight inches or more of snow in 24 hours in all of northern and central Illinois. In southern Illinois, generally south of Interstate 64 where heavy snow is less common, a heavy snow storm is defined as amounts of four inches or more of snow in 12 hours or less, or six inches of snow in 24 hours.

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Ice Storm: Occurs when moisture falls and freezes immediately upon impact, and accumulating to a thickness of one-quarter inch or more, causing damage to trees and power lines, usually resulting in widespread and extended power outages.

The amount and extent of snow or ice, air temperature, wind speed and event duration are characteristics of a severe winter storm. All of these combine to determine the severity of the storm.

Snow Storm: If melted, an inch of snow falling at 32 degrees contains twice the amount of water as an inch of snow falling at 10 degrees. This relationship translates into when snow will blow and drift with high winds that make conditions hazardous for hours or perhaps days. If the temperature is near freezing when snow falls, it rarely drifts. As the temperature falls farther from the freezing mark, then snow is lighter and more prone to blow and drift.

Ice Storm: Factors in how much damage will occur are the amount of rain and thus icing taking place, the strength of the wind and if the storm strikes an urban or rural area.

Extreme Cold: Very cold temperatures, usually in the single digits or below zero, which combined with the wind can cause frostbite or a potentially deadly condition known as hypothermia. The wind chill chart below indicates that frostbite will occur within 30 minutes when temperatures are below zero and wind speeds are 15 mph or greater. Rapid frostbite will occur in 10 minutes or less with temperatures of -20 degrees or colder and wind speeds of 15 mph or higher.

The NWS will issue a wind chill advisory or warning in Illinois for the following wind chill conditions:

North of I-80: Advisory for -20 to -30 degrees, Warning for colder than -30 degrees

Between I-80 and I-64: Advisory for -15 to -25 degrees, Warning for colder than -25 degrees

South of I-64: Advisory for -10 to -25 degrees, Warning for colder than -25 degrees

Wind Chill Chart

Wind (mph)	Temperature (°F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	29	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

TERMS USED BY WEATHER FORECASTERS

Freezing Rain	Rain that freezes when it hits the ground, creating a coating of ice on roads, walkways, trees and power lines.
Sleet	Rain that turns to ice pellets before reaching the ground. Sleet also causes roads to freeze and become slippery.
Winter Storm Watch	A winter storm is possible in your area.
Winter Storm Warning	A winter storm is occurring, or will soon occur in your area.
Blizzard Warning	Sustained winds or frequent gusts to 35 miles-per-hour or greater and considerable falling or blowing snow (reducing visibility to less than a quarter mile) are expected to prevail for a period of three hours or longer.
Frost/Freeze Warning	Below freezing temperatures are expected during the growing season, which will cause damage to local vegetation.

Source: Are You Ready?, FEMA, H-34/September 2002

Different types of precipitation can fall in the same area. As an example, sometimes sleet precedes snow or initially falls at the same time as snow. Also, it is not uncommon to have freezing rain and sleet together.

A major winter storm can immobilize an entire region for a prolonged period of time causing widespread damage and disruption, injury and death. Areas that experience mild winters can be hit by extreme cold or

a major snow or ice storm. A severe winter storm's impact can include hypothermia, closed highways, blocked roads, downed power lines and flooding.

Historical Data

An Illinois winter does not pass without a severe winter storm somewhere in the State. On average, five severe storms strike each year. As few as two and as many as 18 have occurred in some years.

The National Weather Service definition of an Illinois severe winter storm provided by Mr. Chris Miller, WCM, Lincoln, IL, is:

Snowfall: Six inches or more of snow in 12 hours or less, or eight inches or more of snow in 24 hours in all of northern and central Illinois. In southern Illinois, generally south of Interstate 64 where heavy snow is less common, a heavy snow storm is defined as amounts of four inches or more of snow in 12 hours or less, or six inches of snow in 24 hours.

Freezing Rain: An accumulation of 1/4 inch or more

Sleet: An accumulation of ½ inch or more

Severe winters are characterized by either extremely cold periods one to two months in duration, or by severe ice storms or heavy snowfalls occurring repeatedly over a period of six to twelve weeks. Ice storms tend to fill a 50-80 mile band between heavy snows to the north and rain to the south.

One of the worst winter storms to impact the State was on January 26-27, 1967, when as much as 23 inches of snow fell on Moline (Rock Island County) and the Chicago area, paralyzing the O'Hare International Airport. Travel throughout Northern Illinois was curtailed and areas to the south experienced a glaze of ice which made travel virtually impossible until January 29, 1967. Fifty deaths were directly attributed to this storm.

Four of six winters between 1977 and 1982 were regarded as severe. The March 24-27, 1978, Good Friday ice storm was also accompanied by strong winds and rainfall of up to two inches. A television transmitting tower in Decatur (Macon County) collapsed under the weight of the accumulated ice. In 1977-1978, eighteen severe winter storms occurred, making it the worst winter on record.

The following year, 1979, a Federal snow emergency was declared (FDAA 3068-EM) when the northern third of the State received 6 inches or more of snowfall between January 12 and 14. The heaviest snowfall, between 12 and 20 inches, was recorded in the northeast quarter of the State, where traffic was paralyzed and transportation corridors closed. Midway and O'Hare airports recorded maximum amounts of 20 and 19.8 inches of snow, respectively. Walnut (northwest Bureau County) recorded 22 inches; Paw Paw (southeast Lee County) had 12 inches; and Rockford (Winnebago County) had 15.5 inches.

The winter of 1981-82 saw 18 storms and is regarded as the second most severe winter in Illinois history. The extreme cold, blizzard-like conditions, and ice-associated storms stranded travelers, caused extended power outages and record energy consumption, and resulted in numerous injuries and deaths. In response to hazard identification surveys in the mid-eighties (FEMA's CHIP), 174 of the 182 local ESDA respondents ranked winter storms to be their most frequent, destructive, and over-taxing hazard for their jurisdiction.

The Valentine's Day storm of 1990 (FEMA 860-DR) was identified among the 2 or 3 worst ice storms in the last 30 years because (1) its area of impact stretched across central Illinois from Jacksonville (Morgan

County) to Danville (Vermilion County); (2) the thickness of accumulated ice on wires and trees measured between one-half to three-fourths inches in and around the Champaign-Urbana area; (3) the duration of freezing precipitation lasted 10-12 hours; (4) the duration of time without electrical services (30 hours) was common and some homes and businesses were without power for 5 to 7 days; and, (5) the amount of damage to trees was much more extensive than the 1979 ice storm. This was the first time in the last twenty years that a severe winter storm without associated tornadoes or flooding resulted in a Federal declaration, so lessons were learned and procedures written as the response progressed. Ten east-central counties received Federal disaster declarations.

The 1999 New Year's Day storm which intensified over the next two days (January 1-3, 1999) resulted in record snowfall across the northern half of the State. High winds and frigid temperatures caused blizzard conditions behind the snowfall which left 21.6 inches in Chicago, second only to the 1967 January storm. On January 8, 1999, an all-time low temperature, -36 degrees F., was recorded in Congerville (Woodford County). During the first week of the year, the American Red Cross and other organizations sheltered more than 1,600 people. Eventually, 51 counties sought and received Federal public assistance as a result of the magnitude of the storm which severely overtaxed the personnel, equipment and budgets of both State and local governments (FEMA 3134-EM declared January 8, 1999). FEMA approved nearly $40 million in Federal assistance. IEMA reimbursed these funds to local applicants in the 51 counties included in the declaration.

From December 10 through December 31, 2000, the cumulative effects of severe winter storms caused extensive road closures, school closings and hazardous road conditions and severely taxed snow removal resources. During this time period, the Chicago area received a record 41.3 inches of snow. Twenty-seven counties either had a record or near-record snowfall or were contiguous to a county which did. This was the first emergency in Illinois to allow contiguous counties to be approved in the Federal emergency declaration (11 counties had record snowfall, 3 near record and 14 contiguous). This extensive snowfall combined with blowing snow, record low temperatures, freezing rain and ice led to a request for a federal emergency in January, 2001. As of March 2004, FEMA 3161-EM approved nearly $23 million in Federal assistance to the 27 counties for reimbursement for snow removal, de-icing, salting and sanding roads. These 27 counties were scattered throughout the top three-fourths of the State from Winnebago south to St. Clair and from McDonough on the western side to Cook, Clark and Will on the eastern State line.

On December 21-25, 2004, a severe winter storm struck the 17 southern counties. In several counties in southern Illinois, the storm produced record or near-record snowfall, blowing and drifting snow and frigid temperatures. The cumulative effects of the storm included road closures, school closings, hazardous road conditions, and the snow removal resources of State and local governments being severely taxed. Over a million dollars was spent on emergency protective measures (FEMA 3199-EM).

On Thursday, November 30, 2006 through Friday, December 1, 2006, a severe winter storm passed through central and northern Illinois. This storm resulted in heavy snowfall, ice accumulation, frigid temperatures, power outages, strong winds and downed trees and branches. The Governor declared 49 counties disaster areas due to record snowfall and/or extraordinary ice formations. A Presidential Emergency Declaration (FEMA 3269-EM) was received for the record or near-record snowfall in 26 northern and west-central Illinois counties. A Presidential Declaration (FEMA 1681-DR) was received for the ice storm that occurred in 18 central to mid-southwestern counties. Refer to the Illinois Federal Disaster Declaration History for details on the location.

On January 26-28, 2009 a severe winter storm consisting of heavy snow, sleet, and freezing rain impacted southern Illinois. The highest snowfall totals from this 2-day event were 12.5 inches while most affected counties reported up to 10 inches. Nearly a half inch of ice accumulation in southern Illinois caused numerous downed trees and power lines.

On February 13, 2009, Governor Pat Quinn requested a Federal Major Disaster Declaration for nine affected counties within the State of Illinois. On March 2, 2009 President Obama designated the following counties eligible for Public Assistance (PA) under FEMA-1826-DR-IL and statewide eligibility for the Hazard Mitigation Grant Program (HMGP): Alexander, Gallatin, Hardin, Johnson, Massac, Pope, Pulaski, Saline and Union Counties.

On January 31st thru February 2nd, 2011 a wide spread severe winter storm passed over the majority of Illinois resulting in large accumulations of heavy snow. The overall strength of the system produced widespread 1 to 2 inch per hour snowfall rates, with thundersnow only serving to enhance those rates further. Three day snowfall totals ranged from as much as 19 to 20 inches in parts of western Illinois and northeast Missouri, with significant blowing and drifting widespread. Moline, Illinois observed 16.7 inches of snow from the evening of February 1st to the morning of February 2nd, setting a new 24 hour snowfall record by topping January 3, 1971 by 0.3 inches. The Moline three day totals of 18.4 inches also tied the record for a single storm that was set back in January of 1979. This severe winter storm resulted in a Federal Major Disaster Declaration (DR-1960) approving approximately $10.5 million dollars in Federal Assistance to 65 counties for reimbursement for snow removal, de-icing, salting and sanding roads.

A major snowstorm struck central Illinois on March 24th, 2013 bringing significant snow accumulations to much of the area. Due to the convective nature of this event, impressive snowfall rates of 2-3 inches per hour were observed at times. While all of central and southeast Illinois picked up significant snowfall, the highest totals of 10 to 18 inches were concentrated between the I-72 and I-70 corridors. The top amounts were observed across portions of Sangamon and Christian counties. Further north and south, snowfall amounts steadily decreased, with 4 to 5 inches across Stark and Marshall counties, and only 1 to 3 inches across Richland and Lawrence counties in southeast Illinois.

With respect to extreme cold, there have only been five winters since 1900 when temperatures in Illinois have NOT fallen below zero. Extremely cold temperatures and the onset of hypothermia has resulted in 134 fatalities in Illinois since 1997. Nearly 70% of these fatalities were males, mainly in the 40 to 60 year old range, outdoors. The vast majority of the fatalities (110 out of 134) occurred in Cook County.

During the winter of 2006-07, 21 people died (all in Cook County) from the impacts of extreme cold. Two prolonged cold spells – December 2 – 8, 2006 and January 28 – February 19, 2007 resulted in the fatalities. Wind chill values ranged from -20 to -30 degrees during much of the first week of February 2007. *(NWS Storm Data – February 2007)*

Risk Analysis

Historically, one might say the northern half of the State has severe winter storms. In twenty-four years there have been three Federal emergency declarations which included Illinois counties in this area. The last Federal emergency stretched as far south as St. Clair County reaching into the bottom third of the State.

The Illinois Hazard Rating Map for Severe Winter Storms summarizes Illinois winters. Severe winter storms can and do occur in Illinois as identified in the paragraph above. The probability of a severe winter storm may be slightly higher for the northern half of the State (occurring more severely and more often), but all of Illinois has a high probability of a severe winter storm.

Since 1979 there has been seven declared disasters/emergencies for winter storms. If you base your calculations on federal declared disasters/emergencies over the last 28 years, the State could expect one severe winter storm every four years. In the last eight years there has been four declarations, for an average of one every two years. Using the declarations to judge the frequency of severe storms is misleading because an emergency declaration is determined by record setting amounts of snow. So a jurisdiction could have a major event but not receive a declaration. Since the records are based on local data a jurisdiction in the more snow prone northern part of the State could regularly get more snowfall than a declared emergency in the southern part of the State. The Northern part of the State is also much better prepared for large snowfalls.

Over the last 30 years, Illinois has had a minimum of two winter storms a year and a high of 18 severe winter storms in 1977-78 and 1981-82. While it is impossible to predict with any accuracy the probability of a severe winter storms, it is a near certainty that each winter will have at least a couple.

Since 1900, there has only been 5 years in which the state did not record a temperature below zero. This further identifies extreme cold as a common occurrence statewide. The most vulnerable groups are mainly in urban areas, mostly middle aged or elderly, and often homeless.

Loss Estimation for Severe Winter Storms

Loss estimations for severe winter storms were calculated using the same approach as tornados and severe storms. All counties within the State are affected by severe winter storms and were considered at-risk for damages. The risks for each county were calculated from historic data compiled by the National Climatic Data Center, most importantly the Storm Events Database. The total numbers of severe winter storms reported over a 52-year period were divided by the number of years in the reporting period, to establish the annual number of severe winter storms that each county would be expected to have, in probabilistic terms. Then, an average dollar amount of property damage), for each event, was compiled from the same data source. The expected number of severe winter storms per county was then multiplied by the average historic damages reported for each event, to produce an estimate of annual dollar losses, which totaled approximately $4.7 million dollars statewide. The 52 year period that produces information for this study is 1960 to 2012. Higher risks are associated to areas with increased populations as well as residential growth. It should be noted that the NCDC calculates severe winter storms losses and occurrences by region and not on a county by county basis. The NCDC calculates that total losses for each event including: property damage, crop damage, fatalities and injuries and divides the total number by the number of counties in the reporting region. This style of reporting results in certain counties reflecting similar numbers of loss for the same event. Once this calculation has been made for all tracts in a county, the results can be totaled to develop an estimate at the county level. The following figure provides the result of this analysis for counties within the State.

Severe Winter Storm Loss Estimates by County				
County	Number of Severe Winter Storms 1960-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Adams	25	$1,728,341	$69,133.66	48.1%	$33,237.33
Alexander	32	$11,603,858	$362,620.55	61.5%	$223,151.11
Bond	20	$116,924	$5,846.20	38.5%	$2,248.54
Boone	44	$4,078,289	$92,688.40	84.6%	$78,428.64
Brown	23	$1,716,639	$74,636.49	44.2%	$33,012.29
Bureau	38	$3,988,058	$104,948.89	73.1%	$76,693.42
Calhoun	21	$1,577,146	$75,102.19	40.4%	$30,329.73
Carroll	44	$4,084,516	$92,829.90	84.6%	$78,548.38
Cass	31	$1,571,174	$50,683.02	59.6%	$30,214.88
Champaign	36	$1,632,701	$45,352.81	69.2%	$31,398.10
Christian	32	$1,569,861	$49,058.16	61.5%	$30,189.64
Clark	30	$2,268,272	$75,609.06	57.7%	$43,620.61
Clay	22	$90,475	$4,112.48	42.3%	$1,739.90
Clinton	19	$103,410	$5,442.66	36.5%	$1,988.66
Coles	35	$2,182,196	$62,348.44	67.3%	$41,965.30
Cook	79	$4,166,905	$52,745.64	151.9%	$80,132.80
Crawford	21	$90,398	$4,304.65	40.4%	$1,738.42
Cumberland	32	$2,581,862	$80,683.19	61.5%	$49,651.20
DeKalb	44	$4,174,718	$94,879.95	84.6%	$80,283.04
DeWitt	34	$1,581,897	$46,526.37	65.4%	$30,421.09
Douglas	31	$1,910,056	$61,614.71	59.6%	$36,731.85
DuPage	45	$4,128,444	$91,743.20	86.5%	$79,393.15
Edgar	31	$2,418,605	$78,019.52	59.6%	$46,511.64
Edwards	22	$153,887	$6,994.86	42.3%	$2,959.37
Effingham	28	$1,002,038	$35,787.07	53.8%	$19,269.96
Fayette	22	$117,190	$5,326.80	42.3%	$2,253.65

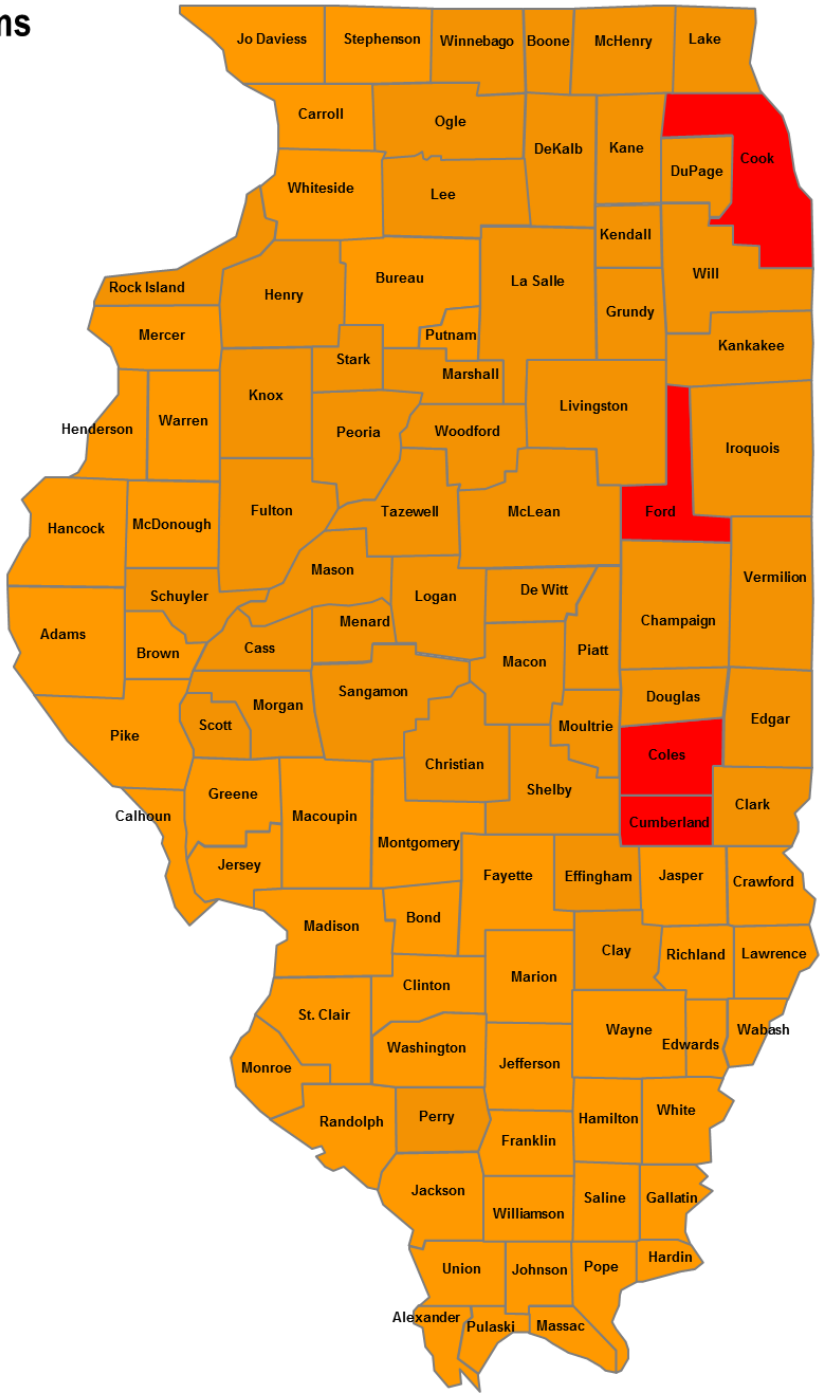
County	Number of Severe Winter Storms 1960-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Ford	33	$2,231,831	$67,631.23	63.5%	$42,919.82
Franklin	24	$383,432	$15,976.35	46.2%	$7,373.70
Fulton	37	$1,706,613	$46,124.69	71.2%	$32,819.49
Gallatin	21	$703,887	$33,518.43	40.4%	$13,536.29
Greene	20	$1,570,174	$78,508.69	38.5%	$30,195.65
Grundy	38	$4,123,233	$108,506.14	73.1%	$79,292.95
Hamilton	23	$203,887	$8,864.65	44.2%	$3,920.90
Hancock	28	$1,708,023	$61,000.82	53.8%	$32,846.59
Hardin	23	$9,603,887	$417,560.31	44.2%	$184,690.14
Henderson	31	$1,853,669	$59,795.77	59.6%	$35,647.48
Henry	42	$4,057,611	$96,609.79	80.8%	$78,030.99
Iroquois	30	$2,218,240	$73,941.34	57.7%	$42,658.47
Jackson	23	$1,033,417	$44,931.17	44.2%	$19,873.40
Jasper	23	$103,988	$4,521.22	44.2%	$1,999.77
Jefferson	21	$148,169	$7,055.68	40.4%	$2,849.41
Jersey	23	$1,570,174	$68,268.42	44.2%	$30,195.65
Jo Daviess	46	$4,104,576	$89,229.90	88.5%	$78,934.15
Johnson	23	$1,753,432	$76,236.19	44.2%	$33,719.86
Kane	46	$4,166,905	$90,584.90	88.5%	$80,132.80
Kankakee	37	$4,345,883	$117,456.29	71.2%	$83,574.67
Kendall	38	$4,008,082	$105,475.84	73.1%	$77,078.50
Knox	39	$1,857,259	$47,622.03	75.0%	$35,716.52
Lake	44	$4,025,296	$91,484.00	84.6%	$77,409.54
LaSalle	46	$4,070,477	$88,488.63	88.5%	$78,278.40
Lawrence	24	$90,475	$3,769.77	46.2%	$1,739.90
Lee	40	$4,081,593	$102,039.82	76.9%	$78,492.17
Livingston	37	$1,767,795	$47,778.24	71.2%	$33,996.05
Logan	33	$1,583,459	$47,983.61	63.5%	$30,451.14

County	Number of Severe Winter Storms 1960-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Macon	32	$1,570,195	$49,068.58	61.5%	$30,196.05
Macoupin	24	$1,570,174	$65,423.91	46.2%	$30,195.65
Madison	22	$117,486	$5,340.29	42.3%	$2,259.36
Marion	20	$93,538	$4,676.89	38.5%	$1,798.80
Marshall	36	$1,896,022	$52,667.27	69.2%	$36,461.96
Mason	34	$1,583,126	$46,562.53	65.4%	$30,444.73
Massac	22	$13,598,624	$618,119.27	42.3%	$261,512.00
McDonough	28	$1,708,023	$61,000.82	53.8%	$32,846.59
McHenry	49	$4,070,477	$83,070.96	94.2%	$78,278.40
McLean	37	$1,622,298	$43,845.91	71.2%	$31,198.05
Menard	30	$1,571,424	$52,380.80	57.7%	$0.00
Mercer	37	$4,047,611	$109,394.90	71.2%	$77,838.68
Monroe	18	$88,821	$4,934.53	34.6%	$1,708.10
Montgomery	26	$1,570,424	$60,400.91	50.0%	$30,200.46
Morgan	29	$1,569,611	$54,124.53	55.8%	$30,184.83
Moultrie	33	$1,770,195	$53,642.26	63.5%	$34,042.20
Ogle	40	$4,081,593	$102,039.82	76.9%	$78,492.17
Peoria	41	$1,889,636	$46,088.69	78.8%	$36,339.16
Perry	23	$218,417	$9,496.38	44.2%	$4,200.32
Piatt	35	$1,591,897	$45,482.76	67.3%	$30,613.40
Pike	21	$1,577,750	$75,130.96	40.4%	$30,341.35
Pope	23	$11,103,887	$482,777.70	44.2%	$213,536.29
Pulaski	21	$11,603,417	$552,543.66	40.4%	$223,142.63
Putnam	35	$3,978,308	$113,665.94	67.3%	$76,505.92
Randolph	18	$90,259	$5,014.39	34.6%	$1,735.75
Richland	22	$90,475	$4,112.48	42.3%	$1,739.90
Rock Island	42	$4,142,611	$98,633.60	80.8%	$79,665.60
Saline	22	$853,887	$38,813.05	42.3%	$16,420.90

County	Number of Severe Winter Storms 1960-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in property damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Sangamon	33	$1,569,861	$47,571.55	63.5%	$30,189.64
Schuyler	33	$1,706,613	$51,715.56	63.5%	$32,819.49
Scott	27	$1,554,460	$57,572.58	51.9%	$29,893.46
Shelby	34	$2,069,861	$60,878.27	65.4%	$39,805.02
St. Clair	23	$603,973	$26,259.69	44.2%	$11,614.86
Stark	35	$1,880,870	$53,739.15	67.3%	$36,170.58
Stephenson	47	$4,109,576	$87,437.78	90.4%	$79,030.30
Tazewell	34	$1,618,840	$47,612.95	65.4%	$31,131.54
Union	22	$1,743,417	$79,246.22	42.3%	$33,527.25
Vermilion	31	$1,562,905	$50,416.28	59.6%	$30,055.86
Wabash	22	$153,887	$6,994.86	42.3%	$2,959.37
Warren	32	$1,858,669	$58,083.40	61.5%	$35,743.63
Washington	15	$60,856	$4,057.10	28.8%	$1,170.32
Wayne	23	$604,220	$26,270.45	44.2%	$11,619.62
White	22	$203,887	$9,267.59	42.3%	$3,920.90
Whiteside	42	$4,057,611	$96,609.79	80.8%	$78,030.99
Will	42	$4,023,233	$95,791.27	80.8%	$77,369.87
Williamson	22	$1,133,432	$51,519.66	42.3%	$21,796.78
Winnebago	44	$4,075,664	$92,628.74	84.6%	$78,378.16
Woodford	36	$1,904,538	$52,903.83	69.2%	$36,625.73

IEMA **Illinois Natural Hazard Mitigation Plan**

Severe Winter Storms Hazard Rating by County



Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a National Weather Service Zone by county basis

F. Drought

Description

Drought is a normal and a recurrent feature of climate, however, it is only a temporary feature of climate. Drought characteristics vary from one region to another, but drought occurs almost everywhere. All societies are vulnerable to this natural hazard and it can affect vast territorial regions and large population numbers. A drought may not have a distinct start and its termination may be difficult to recognize. Weather conditions, soil moisture, runoff, water table conditions, water quality and stream flow are all natural factors that are important in determining drought. High temperature, high wind and low relative humidity can significantly aggravate its severity.

This hazard is difficult to define and yet it has scores of definitions. It originates from a deficiency of precipitation over an extended period of time, usually a season or more. This deficiency results in a water shortage for some activity, group or environmental sector. Operational definitions help people identify the beginning, end and degree of severity of a drought. There are four commonly used operational definitions:

> Meteorological Drought: A period of well-below-average precipitation that spans from a few months to a few years.
> Agricultural Drought: A period when soil moisture is inadequate to meet the demands for crops to initiate and sustain plant growth.
> Hydrological Drought: A period of below-average stream flow and/or depleted reservoir storage (i.e., stream flow, reservoir and lake levels, ground water).
> Economic Drought: This definition deals with the supply and demand of water. Some years there is an ample supply of water and in other years there is not enough to meet human and environmental needs.

Generally drought is associated with a sustained period (which differs for each drought impact) of significant below average water or moisture supply. The degree of precipitation deficiency, the duration and the size of the affected area determines the severity of the drought. A drought can ruin agricultural- and tourism- based local economies and increase the risk of fire, flash flood and possible landslides/debris flow.

Drought Impacts:

- Damaged/diminished crop harvests
- Loss of Electricity generation
- Poor surface water quality
- Scarce drinking water supplies/rationing
- Recreation opportunities lost
- Transportation problems

Historical Data

Droughts are differentiated on the basis of use and need for water into three categories:

1. Meteorological = precipitation shortfall
2. Agricultural = soil moisture deficit
3. Hydrological = surface and groundwater deficit

Statewide meteorological droughts are also further subdivided into specific lengths of occurrence:

- A 3-month drought exists if the State average for rainfall is less than or equal to 60 percent of the mean;
- A 6-month drought exists if the State average for rainfall is less than or equal to 70 percent of the mean;
- A 12-month drought exists if the State average for rainfall is less than or equal to 80 percent of the mean.

One-month precipitation deficits on a statewide or regional basis do not usually constitute droughts, although there may be significant impacts on agriculture depending on the time in the growing season and on soil moisture conditions. Agricultural and hydrologic droughts have different lag times in relation to the timing of precipitation, and their intensities do not correlate exactly with one another.

Agricultural droughts typically trigger the availability of several USDA emergency assistance programs from the Farmers Home Administration (loans), Agricultural Stabilization and Conservation Service (disaster assistance payments), Natural Resource Conservation Service (formerly SCS, for technical assistance), and Federal Crop Insurance Corporation (loss claims).

In September 1983, all 102 counties were proclaimed State disaster areas because of high temperatures and insufficient precipitation beginning in mid-June. More recently in 1988, 54 percent of the State was impacted by drought-like conditions, resulting in disaster relief payments to landowners and farmers exceeding $382 million, but no State proclamations.

Hydrologic droughts reduce run-off and river, lake and groundwater levels. Normally, such droughts are preceded by several months of below-normal precipitation and develop more slowly than a meteorological or agricultural drought. Noticeably reduced water levels may occur within one or two months, but sometimes as much as three to twelve months after a precipitation deficit begins. Low river levels result in navigation blockages and emergency dredging. In 1988, a plan was put in place to divert water from Lake Michigan into the Mississippi River during the 1988 drought to aid in riverine navigation. This plan was never followed through, however, emergency dredging was carried out successfully.

The Palmer Drought Severity Index (PDSI) is an attempt to compare weekly temperature and precipitation readings over a defined climatic region in order to identify periods of abnormally dry (or wet) weather. These PDSI readings reflect the relative disparity between moisture supply (precipitation and soil moisture) and demand (evapotranspiration, soil recharge and runoff needs) for a particular region based upon what is considered normal for the area. The index is used to evaluate scope, severity, and duration of abnormal weather.

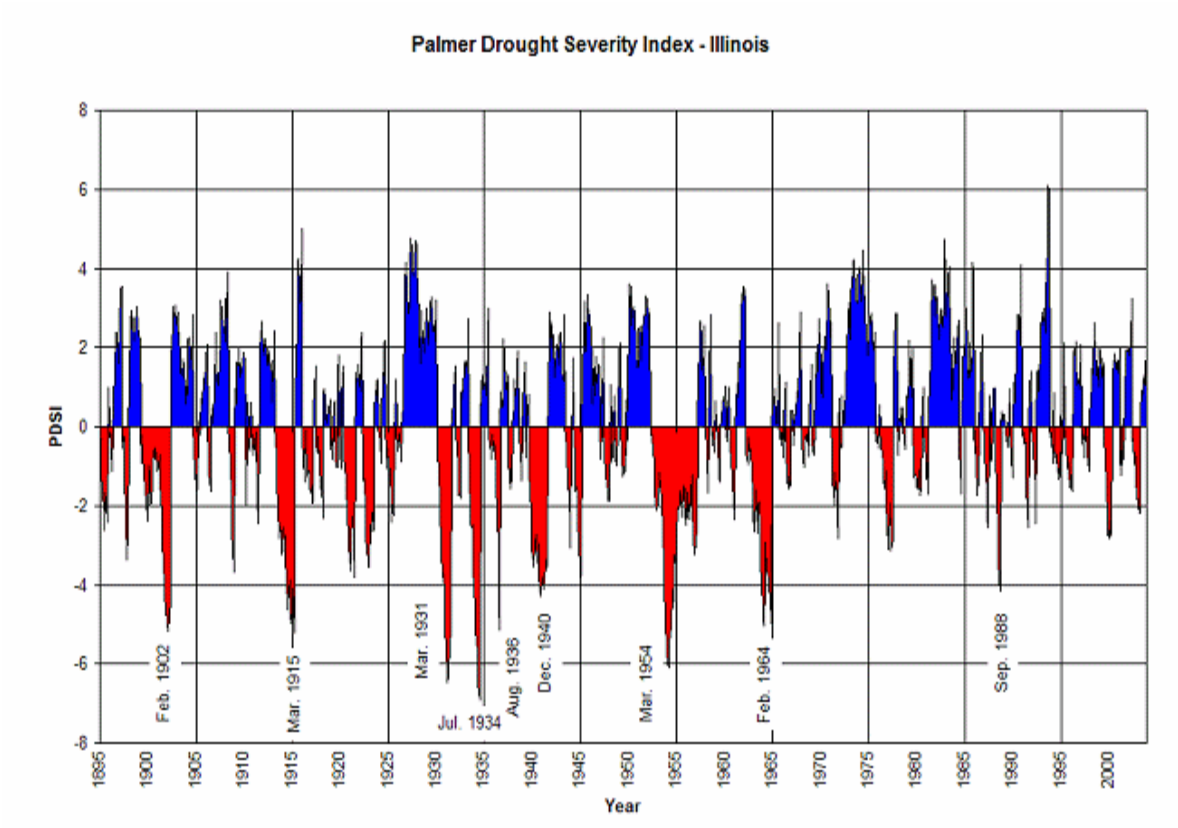


Figure: Time series of the state-wide monthly Palmer Drought Severity Index for Illinois from 1895 to 2006. Areas in blue represent wet periods while areas in red represent dry periods. Supplied by the Illinois State Water Survey.

Both the timing and amount of precipitation are responsible for the occurrence of a drought. The mean annual precipitation in Illinois varies from 34 inches in Northern Illinois to 46 inches in the South. Annual amounts fluctuate primarily within a 10-inch range of the median. The most severe drought in recent years was 1988, when rainfall was 88 percent of normal. The timing or distribution was also abnormal because 1988 saw less than 50 percent of the April through August normal rainfall. Droughts of this magnitude occur about once every 21 years.

A smaller drought occurred in the northern two-thirds of the State (NWS zones 1-10). Although it only lasted through the month of May 1992, Chicago, Moline and Rockford recorded the driest May on record, and Springfield and Peoria their second driest.

Precipitation of less than 88 percent of normal also occurred in all of Illinois in September of 1994, Northwestern Illinois in December of 1994, the northern half of the State in February of 1995, all of the State in March, and the northern half again in June of 1995. However, even though precipitation values were below average, none of these were considered drought-like conditions officially.

Precipitation values from 54 to 65 percent of normal for the months of February and April of 1996 in northwest and central portions of the State would technically put those areas into the 3-month or 6-month precipitation drought categories. However, above average precipitation in May reversed all drought impacts.

Precipitation values from 54 to 65 percent of normal for the months of February and April of 1996 in northwest and central portions of the State would technically put those areas into the 3-month or 6-month precipitation drought categories. However, above average precipitation in May reversed all drought impacts.

A severe drought struck Illinois in 2005-06, especially in the northern half of the State. Dry conditions in 2005 reached a historic level of severity in some parts of Illinois and ranked as one of the three most severe droughts in Illinois in 112 years of record. The timing of the dryness during the spring and summer, when water demand and use are high, ensured substantial impacts on agriculture and other sectors. The drought also had several unusual characteristics. The drought area was long and narrow, extending from south Texas to the Great Lakes, but within the Midwest, the drought had relatively minor impacts on states other than Illinois. A record number of remnants of hurricanes and tropical storms passed through Illinois during July, August and September, substantially ameliorating drought conditions in portions of central and southern Illinois. Crop yields were surprisingly high in parts of the State, perhaps providing evidence of increased drought resistance in modern varieties and the benefits of timely rains.

Map Supplied by National Drought Monitoring Center
Shows drought conditions on August 14, 2012

In 2012 another severe drought occurred in Illinois, affecting a large majority of the State. The drought conditions intensified throughout the summer months and into early fall. Agricultural impacts became evident in late July as hydrologic conditions continued to deteriorate. The statewide average precipitation total from June 21 to July 3 was 0.5 inches, only 28 percent of normal. The statewide average temperature during this time was 78.0 degrees, 3.8 degrees above normal. Extremely hot weather occurred during the second half of this period with highs in the 90s and low 100s common across the state. At least 56 sites in Illinois broke their daily high temperature records on June 28 and 29. The statewide average precipitation for June was 1.8 inches, which is 2.3 inches below normal and 43 percent of normal. It was the eighth driest June on record. June 1988 was the driest on record at 1.1 inches. The statewide average precipitation for the first half of 2012 was 12.6 inches, making it the sixth driest on record.

The Governor's Drought Response Task Force was activated with the Governor's approval when drought conditions warrant a unified statewide approach. This task force was activated on June 19, 2012 by the State Water Plan Task Force with the approval of the Governor's Office. A copy of the "Drought of 2012 – A Report of the Governor's Drought Response Task Force", is attached as an appendix to the INHMP. The State's Drought Response Task Force continues to hold telephone conference calls when necessary; however, except for a few isolated areas there have been no statewide drought problems since 1988. The US Drought Monitor is the standard for determining drought in the US.

Risk Analysis

The following paragraph was provided by Jim Angel, State Climatologist at the Illinois State Water Survey, to explain the Illinois Hazard Rating Drought Map.

One of the obstacles to an objective and reasoned reaction to drought in Illinois is uncertainty over its definition. One way of measuring drought is through the Palmer Drought Severity Index (PDSI), which takes into account both temperature and precipitation in determining the severity of drought. Historically, the 1930s and 1950s were periods when drought was most frequent and troublesome in Illinois. More recently, the 1988 drought was severe but short-lived, lasting from June to October of that year. Based on the PDSI, the risk of drought has historically been evenly distributed across the State. This is not surprising since drought is partially the result of changes in the large-scale circulation patterns of the atmosphere, for example, the location of a high-pressure dome over the Midwest in summer. Historically, moderate to severe drought occurs about 17% of the time in Illinois. However, Southern Illinois is generally more vulnerable to drought due to soils that hold less water and water supplies that are more likely to rely on shallow groundwater and surface water.

Loss Estimation For Drought

Loss estimations for drought were calculated using the same approach as severe winter storms. All counties within the State are affected by drought to some degree and were considered at-risk for damages. The risks for each county were calculated from historic data compiled by the National Climatic Data Center, most importantly the Storm Events Database. The total numbers of severe winter storms reported over a 22-year period were divided by the number of years in the reporting period, to establish the annual number of severe winter storms that each county would be expected to have, in probabilistic terms. Then, an average dollar amount of crop damage), for each event, was compiled from the same data source. Droughts historically, do not produce large amounts of property damage as other hazards. However, crop damage is utilized to depict that loss estimates as related to drought events. The expected number of drought per county was then multiplied by the average historic damages reported for each event, to produce an estimate of annual dollar losses, which totaled approximately $72 million dollars statewide. The 22 year period that produces information for this study is 1990 to 2012. Higher risks are associated to areas with increased populations as well as residential growth. It should be noted that the NCDC calculates drought losses and occurrences by region and not on a county by county basis. The NCDC calculates that total losses for each event including: property damage, crop damage, fatalities and injuries and divides the total number by the number of counties in the reporting region. This style of reporting results in certain counties reflecting similar numbers of loss for the same event. Once this calculation has been made for all tracts in a county, the results can be totaled to develop an estimate at the county level. The following figure provides the result of this analysis for counties within the State.

Drought Loss Estimates by County				
County	**Number of Droughts 1990-2012 (NCDC)**	**Total Recorded Loss (NCDC)**	**Average $ in crop damage per event (NCDC)**	**Annual Probability of Event**	**Estimated Annual Loss**
Adams	6	$0	$0.00	27.3%	$0.00
Alexander	20	$6,252,987	$312,649.36	90.9%	$284,226.69
Bond	5	$13,514	$2,702.70	22.7%	$614.25
Boone	9	$0	$0.00	40.9%	$0.00
Brown	5	$0	$0.00	22.7%	$0.00
Bureau	13	$34,410,769	$2,646,982.25	59.1%	$1,564,125.87
Calhoun	6	$0	$0.00	27.3%	$0.00
Carroll	15	$33,384,615	$2,225,641.03	68.2%	$1,517,482.52
Cass	4	$28,600,000	$7,150,000.00	18.2%	$1,300,000.00
Champaign	3	$7,260,000	$2,420,000.00	13.6%	$330,000.00
Christian	3	$53,800,000	$17,933,333.33	13.6%	$2,445,454.55
Clark	5	$34,413,514	$6,882,702.70	22.7%	$1,564,250.61
Clay	7	$32,213,513	$4,601,930.47	31.8%	$1,464,250.61
Clinton	4	$13,514	$3,378.38	18.2%	$614.25
Coles	4	$34,493,514	$8,623,378.38	18.2%	$1,567,886.98
Cook	9	$0	$0.00	40.9%	$0.00
Crawford	7	$30,413,514	$4,344,787.64	31.8%	$1,382,432.43
Cumberland	5	$23,713,514	$4,742,702.70	22.7%	$1,077,886.98
DeKalb	9	$0	$0.00	40.9%	$0.00
DeWitt	4	$22,000,000	$5,500,000.00	18.2%	$1,000,000.00
Douglas	3	$28,600,000	$9,533,333.33	13.6%	$1,300,000.00
DuPage	9	$0	$0.00	40.9%	$0.00
Edgar	4	$42,813,514	$10,703,378.38	18.2%	$1,946,068.80
Edwards	16	$56,463,514	$3,528,969.59	72.7%	$2,566,523.34
Effingham	5	$32,813,514	$6,562,702.70	22.7%	$1,491,523.34
Fayette	5	$13,514	$2,702.70	22.7%	$614.25

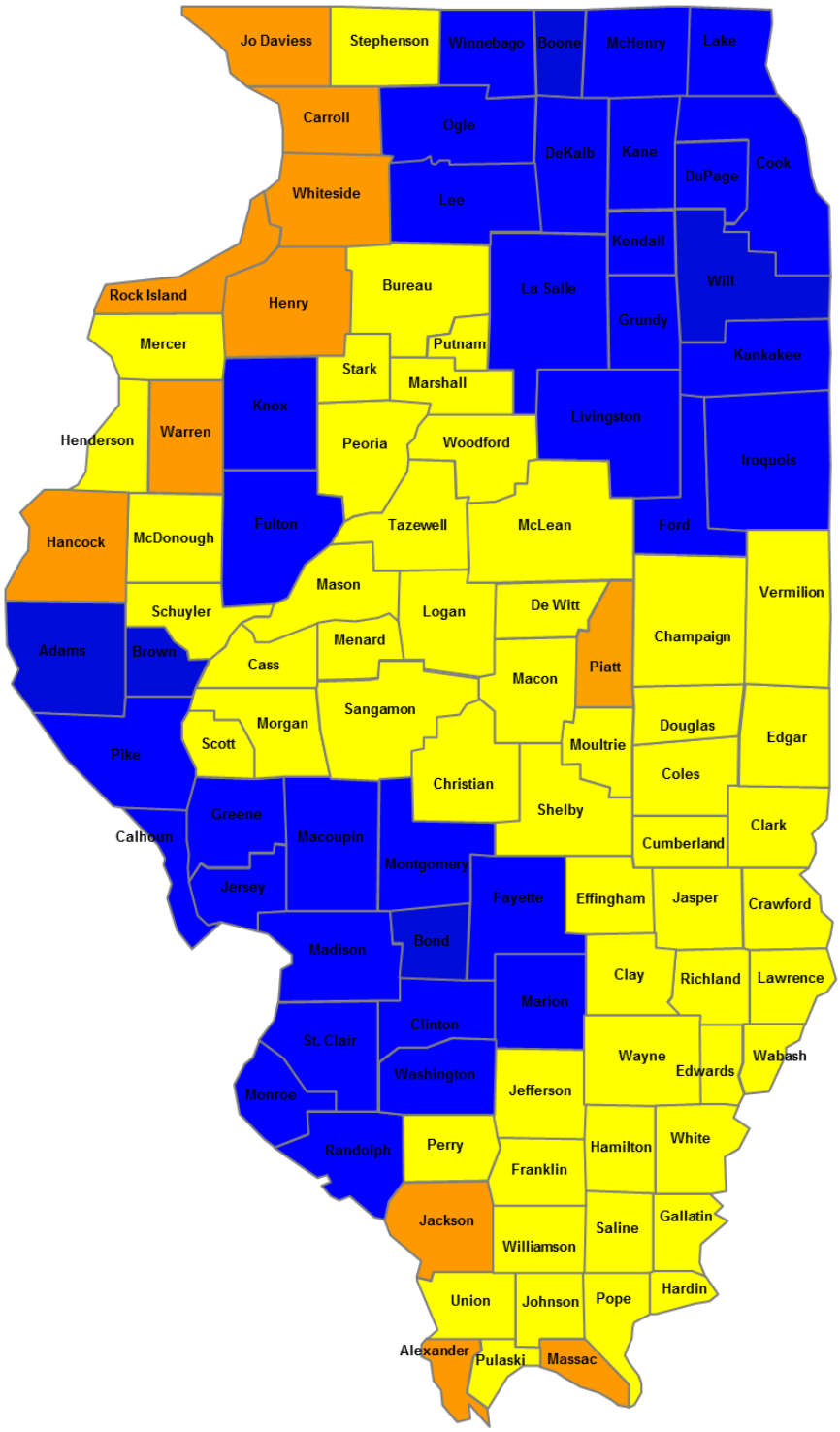
County	Number of Droughts 1990-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in crop damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Ford	2	$0	$0.00	9.1%	$0.00
Franklin	18	$6,252,987	$347,388.18	81.8%	$284,226.69
Fulton	4	$3,300,000	$825,000.00	18.2%	$150,000.00
Gallatin	19	$6,252,987	$329,104.59	86.4%	$284,226.69
Greene	6	$0	$0.00	27.3%	$0.00
Grundy	9	$0	$0.00	40.9%	$0.00
Hamilton	18	$6,252,987	$347,388.18	81.8%	$284,226.69
Hancock	15	$17,683,846	$1,178,923.08	68.2%	$803,811.19
Hardin	20	$6,252,987	$312,649.36	90.9%	$284,226.69
Henderson	15	$22,913,846	$1,527,589.74	68.2%	$1,041,538.46
Henry	13	$35,010,000	$2,693,076.92	59.1%	$1,591,363.64
Iroquois	1	$0	$0.00	4.5%	$0.00
Jackson	17	$6,252,987	$367,822.78	77.3%	$284,226.69
Jasper	7	$33,913,514	$4,844,787.64	31.8%	$1,541,523.34
Jefferson	14	$6,252,987	$446,641.94	63.6%	$284,226.69
Jersey	6	$0	$0.00	27.3%	$0.00
Jo Daviess	13	$17,584,615	$1,352,662.72	59.1%	$799,300.70
Johnson	18	$6,252,987	$347,388.18	81.8%	$284,226.69
Kane	9	$0	$0.00	40.9%	$0.00
Kankakee	4	$0	$0.00	18.2%	$0.00
Kendall	9	$0	$0.00	40.9%	$0.00
Knox	4	$2,700,000	$675,000.00	18.2%	$122,727.27
Lake	9	$0	$0.00	40.9%	$0.00
LaSalle	9	$0	$0.00	40.9%	$0.00
Lawrence	7	$25,513,514	$3,644,787.64	31.8%	$1,159,705.16
Lee	10	$0	$0.00	45.5%	$0.00
Livingston	10	$0	$0.00	45.5%	$0.00
Logan	5	$34,200,000	$6,840,000.00	22.7%	$1,554,545.45

County	Number of Droughts 1990-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in crop damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Macon	4	$46,300,000	$11,575,000.00	18.2%	$2,104,545.45
Macoupin	6	$0	$0.00	27.3%	$0.00
Madison	5	$13,514	$2,702.70	22.7%	$614.25
Marion	4	$13,514	$3,378.38	18.2%	$614.25
Marshall	4	$21,400,000	$5,350,000.00	18.2%	$972,727.27
Mason	5	$29,800,000	$5,960,000.00	22.7%	$1,354,545.45
Massac	20	$6,252,987	$312,649.37	90.9%	$284,226.70
McDonough	15	$17,584,615	$1,172,307.69	68.2%	$799,300.70
McHenry	9	$0	$0.00	40.9%	$0.00
McLean	4	$65,500,000	$16,375,000.00	18.2%	$2,977,272.73
Menard	4	$17,400,000	$4,350,000.00	18.2%	$0.00
Mercer	13	$17,584,615	$1,352,662.72	59.1%	$799,300.70
Monroe	5	$13,514	$2,702.70	22.7%	$614.25
Montgomery	5	$0	$0.00	22.7%	$0.00
Morgan	3	$43,200,000	$14,400,000.00	13.6%	$1,963,636.36
Moultrie	3	$23,000,000	$7,666,666.67	13.6%	$1,045,454.55
Ogle	10	$0	$0.00	45.5%	$0.00
Peoria	4	$34,300,000	$8,575,000.00	18.2%	$1,559,090.91
Perry	16	$6,252,987	$390,811.70	72.7%	$284,226.69
Piatt	4	$32,000,000	$8,000,000.00	18.2%	$1,454,545.45
Pike	6	$0	$0.00	27.3%	$0.00
Pope	21	$6,252,987	$297,761.29	95.5%	$284,226.69
Pulaski	20	$6,252,987	$312,649.36	90.9%	$284,226.69
Putnam	13	$17,584,615	$1,352,662.72	59.1%	$799,300.70
Randolph	5	$13,514	$2,702.70	22.7%	$614.25
Richland	7	$24,713,514	$3,530,501.93	31.8%	$1,123,341.52
Rock Island	15	$26,794,615	$1,786,307.69	68.2%	$1,217,937.06
Saline	18	$6,252,987	$347,388.18	81.8%	$284,226.69

County	Number of Droughts 1990-2012 (NCDC)	Total Recorded Loss (NCDC)	Average $ in crop damage per event (NCDC)	Annual Probability of Event	Estimated Annual Loss
Sangamon	3	$65,900,000	$21,966,666.67	13.6%	$2,995,454.55
Schuyler	3	$1,600,000	$533,333.33	13.6%	$72,727.27
Scott	3	$19,100,000	$6,366,666.67	13.6%	$868,181.82
Shelby	3	$52,100,000	$17,366,666.67	13.6%	$2,368,181.82
St. Clair	5	$13,514	$2,702.70	22.7%	$614.25
Stark	4	$15,900,000	$3,975,000.00	18.2%	$722,727.27
Stephenson	15	$38,644,615	$2,576,307.69	68.2%	$1,756,573.43
Tazewell	5	$35,900,000	$7,180,000.00	22.7%	$1,631,818.18
Union	18	$6,252,987	$347,388.18	81.8%	$284,226.69
Vermilion	3	$65,400,000	$21,800,000.00	13.6%	$2,972,727.27
Wabash	16	$6,252,987	$390,811.70	72.7%	$284,226.69
Warren	15	$21,130,000	$1,408,666.67	68.2%	$960,454.55
Washington	4	$0	$0.00	18.2%	$0.00
Wayne	14	$6,252,987	$446,641.94	63.6%	$284,226.69
White	18	$6,252,987	$347,388.18	81.8%	$284,226.69
Whiteside	15	$39,444,615	$2,629,641.03	68.2%	$1,792,937.06
Will	9	$0	$0.00	40.9%	$0.00
Williamson	19	$6,252,987	$329,104.59	86.4%	$284,226.69
Winnebago	10	$0	$0.00	45.5%	$0.00
Woodford	4	$29,200,000	$7,300,000.00	18.2%	$1,327,272.73

IEMA **Illinois Natural Hazard Mitigation Plan**

Drought Hazard Rating by County



Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a National Weather Service Zone by county basis

G. Extreme Heat

Description

Extreme heat for a region is temperatures that hover 10 degrees or more above the average high temperature for several days to several weeks. The definitions do vary by region; however, a heat wave is usually defined as a period of at least three consecutive days above 90 degrees.

Heat kills by pushing the human body beyond its limits. Normally the body's internal thermostat produces perspiration that evaporates to cool and regulate the body's temperature to 98.6 degrees. Sweating does nothing to cool the body unless the water is removed by evaporation. High humidity retards this process. Because the body has been robbed of its ability to cool itself, the body must work much harder to maintain a normal temperature in extreme heat and high humidity. A sunburn will slow the skin's ability to release excess heat.

Young children, the elderly, those who are sick, overweight or have alcohol problems and men in general, (because they sweat more and become more quickly dehydrated) are more susceptible to extreme heat.

The chronically ill and elderly are often taking prescription medications (e.g., diuretics, anticholinergic, antipsychotics and antihypertensive) that interfere with the body's ability to dissipate heat. Usually the victims have been overexposed to heat or have over-exercised for their age and physical condition.

Stagnant atmospheric (humid and muggy) conditions and poor air quality can induce heat-related illnesses. In addition to air quality, concrete and asphalt store heat longer and gradually release the heat at night which produces higher nighttime temperatures. Therefore, people living in urban areas may be at a greater risk than people in rural regions. On the next page is a heat index chart that allows you to identify the apparent temperature. Find where the temperature across the top of the chart and the relative humidity down the left side of the chart intersect for the apparent temperature.

Heat Index Chart (Temperature & Relative Humidity)

RH (%)	Temperature (° F)															
	90	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	**99**	**100**	**101**	**102**	**103**	**104**	**105**
90	119	123	128	132	137	141	146	152	157	163	168	174	180	186	193	199
85	115	119	123	127	132	136	141	145	150	155	161	166	172	178	184	190
80	112	115	119	123	127	131	135	140	144	149	154	159	164	169	175	180
75	109	112	115	119	122	126	130	134	138	143	147	152	156	161	166	171
70	106	109	112	115	118	122	125	129	133	137	141	145	149	154	158	163
65	103	106	108	111	114	117	121	124	127	131	135	139	143	147	151	155
60	100	103	105	108	111	114	116	120	123	126	129	133	136	140	144	148
55	98	100	103	105	107	110	113	115	118	121	124	127	131	134	137	141
50	96	98	100	102	104	107	109	112	114	117	119	122	125	128	131	135
45	94	96	98	100	102	104	106	108	110	113	115	118	120	123	126	129
40	92	94	96	97	99	101	103	105	107	109	111	113	116	118	121	123
35	91	92	94	95	97	98	100	102	104	106	107	109	112	114	116	118
30	89	90	92	93	95	96	98	99	101	102	104	106	108	110	112	114

Note: *Exposure to full sunshine can increase HI values by up to 15° F*

Source: *Meteorology for Scientists and Engineers, 2nd edition* by Roland B. Stull
HI = Heat Index *T* = Temperature (° F) *RH* = Relative Humidity (%)
Below are terms to become familiar with:

EXTREME HEAT TERMS

Heat Wave	Prolonged period of excessive heat often combined with excessive humidity.
Heat Index	A number in degrees Fahrenheit (F) that tells how hot it feels when relative humidity is added to the air temperature. The Heat Index assumes an average-sized adult, with clothing, in the shade, with a 5-mph wind. Exposure to full sunshine can increase the heat index by 15 degrees.
Heat Cramps	Muscular pains and spasms due to heavy exertion. Although heat cramps are the least severe of heat related medical problems, they are often the first signal that the body is having trouble with the heat.
Heat Exhaustion	Typically occurs when people exercise heavily or work in a hot, humid place where body fluids are lost through heavy sweating. Blood flow to the skin increases, causing blood flow to decrease to the vital organs. This results in a form of mild shock. If not treated, the victim's condition will worsen. Body temperature will keep rising and the victim may suffer heat stroke.
Heat Stroke	Heat stroke is life-threatening. The victim's temperature control system, which produces sweating to cool the body, stops working. The body temperature can rise so high that brain damage and death may result if the body is not cooled quickly.
Sun Stroke	Another term for heat stroke.

Source: Are You Ready?, FEMA, H-34/September, 2002

The chart below indicates the heat index at which the high risk group might experience medical problems described on the previous page:

HEAT INDEX/HEAT DISORDERS

Heat Index	Possible Heat Disorders for People in Higher Risk Groups
130º or higher	Heat stroke/sun stroke, highly likely with continued exposure.
106º - 130º	Sun stroke/heat cramps or heat exhaustion likely, and heat stroke possible with prolonged exposure and/or physical activity.
90 º -108º	Sun stroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity.
80 º - 90º	Fatigue possible with prolonged exposure and/or physical activity.

Source: Heat Wave, produced by NOAA, FEMA and ARC, NOAA/PA 85001

Historical Data

Severe heat waves have caused catastrophic crop failures, thousands of deaths and widespread power outages due to increased use of air conditioning.

The Illinois Department of Public Health (IDPH), as well as the National Weather Service (NWS) has provided information on heat related deaths. Identifying the exact number of deaths due to heat is very difficult. Usually heat is not the primary cause listed on the death certificate but an “underlying cause”. The table on the next page with mortality statistics is presented in this manner. This table is updated with the most current data available at the time.

HEAT RELATED DEATHS, ILLINOIS 1990-2011

YEAR	CAUSEU	CAUSE 1	CAUSE 2	CAUSE 3	CAUSE 4
1990	7	0	0	0	0
1991	10	0	0	1	0
1992	1	0	0	0	0
1993	12	0	0	0	0
1994	11	0	0	1	0
1995	152	3	0	526	18
1996	10	0	0	8	1
1997	12	1	0	17	3
1998	12	0	0	13	1
1999	74	65	11	6	0
2000	11	1	0	0	0
2001	19	11	5	1	0
2002	22	23	2	2	0
2003	5	4	0	2	0
2004	3	0	0	1	0
2005	10	2	0	1	0
2006	17	29	3	1	1
2007	8	5	2	0	0
2009	1	0	5	3	0
2010	0	0	1	6	0
2011	1	1	4	27	0

In 1995 they have approximately another 550 death certificates where heat was listed as a contributing cause only, not an underlying cause.

A second approach IDPH has of identifying heat as being responsible for deaths is to look at "excess deaths". In 1995, there were roughly 600-700 excess deaths. Both of these methods used by IDPH identify heat as a contributor to the death of 600 to 700 people. These figures are slightly higher for 1995 than other figures identified in this section. All of the sources have documented that excessive heat can contribute to death.

The heat waves of the summer of 1995 caused deaths and injuries previously unseen in the State of Illinois from such a phenomenon. Throughout the entire State, the combination of record or near-record high temperatures and high dew point temperatures led to heat indices routinely above the 120-degree mark from July 12-17. The heat index peaked at 125 degrees on July 14 when the air temperature was 98 degrees and the relative humidity was 63 percent. Conditions such as these create hardships for respiratory and cardiovascular systems of every person, but especially in toddlers and the elderly.

The human body is very capable of handling extreme temperatures; however, when high humidity accompanies these conditions, it is often too much for the body to handle (the same is true for the human body with cold temperatures when combined with strong winds, producing dangerous wind chills). Scattered power outages compounded the problem when Commonwealth Edison, the supplier of electricity to virtually the entire Chicago metropolitan area, and other electric utilities could not keep up with the record demand.

Of the 583 fatalities associated with the 1995 heat waves, 75 death certificates listed heat as the primary cause, and 508 as the secondary cause. In a sampling of 134 of the heat victims, 61% were over the age of 65, but only 2 of the 134 fatalities (1.5%) were toddlers. 504 of the deaths were in Chicago. At the time there was a perception that the numbers were inflated, later studies indicated the opposite was true and the heat victims were significantly undercounted. Local officials believed that many of the elderly were scared to come out of their apartments because of high amounts of crime in their neighborhoods. Many were found in their rooms with air temperatures in excess of 120 degrees. The City of Chicago has taken a number of steps to mitigate the health hazards in the event of future heat waves, including a program for home visits to check the condition of people indicated as vulnerable.

In 1999, the entire Midwest was above normal in temperature for the month of July, with the last ten days consisting of a major heat wave. As a ten-day average, both maximum and minimum temperatures were 7 to 11 degrees above normal. The peak of the heat struck on July 29th and 30th in most of the Midwest. Minimums exceeded 78 degrees in cities like Chicago, St. Louis and Cincinnati, where many heat related deaths occurred. The maximum temperature exceeded 100 degrees in many of these same cities, with most of the Midwest recording maximums 10 to 20 degrees above normal.

Risk Analysis

The New York Times article dated August 13, 2002, "Most Deadly of the Natural Disasters: The Heat Wave" states that heat waves kill more people in the United States than all other natural disasters combined. The article goes on to state that a University of Delaware study indicated that 1,500 American city dwellers die each year because of heat compared with 200 from tornadoes, earthquakes and floods combined.

This natural disaster has long been overlooked because there is not visible damage like in a tornado and its impact is greatly understated in terms of human toll because not all heat related deaths are recorded. The current mitigation planning process encourages the State to look at such factors as urbanization, the elderly and low income. It is impossible to ignore these factors when analyzing heat waves. According to

historical discussion and the above referenced article, when the Chicago heat wave of July 1995, occurred "the poor, the old, residents of abandoned and violent neighborhoods that lived alone, lacked access to transportation and lacked air-conditioning" were the victims.

The Extreme Heat Map based on the Illinois Hazard Rating Process predicts what one would expect based on general knowledge and the previous discussion. Especially Southern and Central Illinois can be extremely hot and humid which is indicated by the high category. Taking into account the urbanization effect will add Cook County and the collar counties which is also indicated on the map as a high category.

Chicago had previously experienced deadly heat waves in 1955 when "large numbers of deaths" occurred and in 1916 with 535 deaths. In the 1990's two significant heat waves impacted Chicago. In the 1995 heat wave, the number of estimated fatalities varies, but most sources agree that the number exceeded 700. Then in 1999, Chicago experienced another heat wave that closely matched the 1995 event, but the death toll was reduced to approximately 100 people. A paper written by Michael Palace and Stanley Chagnon, of the State Water Survey, attribute much of the reduction in deaths to mitigation efforts. The efforts included education by the news media and care monitoring procedures for the urban elderly. The September 2005, Chicago All-Hazard Risk Assessment also states the 1999 deaths were lower than 1995 and believed to be the result of the implementation of Chicago's Extreme Weather Operations Plan.

The conditions in Chicago during the heat wave of 1999 were similar to those of the 1995 heat wave, both in temperatures and duration. It is unlikely that the reduction of deaths in Chicago in 1999 is due solely to meteorological differences between the two heat waves. In St. Louis, the 1999 heat wave lasted much longer than the 1995 heat wave, which can explain the increase in the death toll.

By examining the response changes in both Chicago and St. Louis, a conclusion can be made that both cities were successful in mitigating their heat wave response. This evidence is encouraging as it shows a great improvement for the city of Chicago. The efforts to further improve heat wave response in both cities will continue. "American Meteorological Society. The Nature and Impacts of the July 1999 Heat Wave in the Midwestern United States: Learning from the Lessons of 1995" (July 2001) Michael A. Palecki, Stanley A. Changnon, and Kenneth E. Kunkel Midwestern Regional Climate Center, Illinois State Water Survey, Champaign, Illinois.

As stated on the previous page, in the 1990s there were two heat related incidents in the State. Since 1999 there has not been another major heat wave. The time we have until the next heat wave is unknown, but all of the major reports on global warming indicate that an increase in severe heat waves is likely. Chicago is one of the State's most vulnerable area because of area and population, their Risk Assessment predicts 17.8 days a year where temperatures breach the 90 degree mark.

Articles all agree that summer heat kills more people than other natural hazards. The National Weather Service (NWS) indicates that in a normal year the number will be 175 Americans. Other sources project the number of deaths to be much higher each year. So not only do we not know when heat waves will strike, we do not have a firm estimate on the number of people who will be impacted.

The NWS offices with responsibility for counties in the State of Illinois will initiate alert procedures to warn people of the impending danger due to excessive heat. When the heat index is forecast to exceed 105 - 110 degrees for at least two consecutive days, NWS procedures are:

I. Heat Index values will be included in all NWS forecasts.

II. "Hazardous Weather Outlook" products will highlight any threat of excessive heat for the following 1 to 7 day period.

III. "Excessive Heat Warning" products will present a detail discussion of:
   A. The extent and expected duration of the hazard, including forecast temperatures and heat index values.
   B. Who is most at risk.
   C. Safety rules for reducing the risk. .

IV. Assist state and local health officials to prepare emergency messages prior to and during excessive heat events. Meteorological information from "Excessive Heat Warnings" will be included, as well as more detailed medical information, advice, and names and telephone numbers of health officials.

V. Forecasts, outlooks and warnings will be released by the NWS to the media, over NOAA's All Hazards Weather Alert Radio system, and via NEWS web sites.

Each National Weather Service Forecast Office issues the following heat related products as conditions warrant.

- Excessive Heat Outlooks – Issued when the potential exists for an excessive heat event in the next 3-7 days.

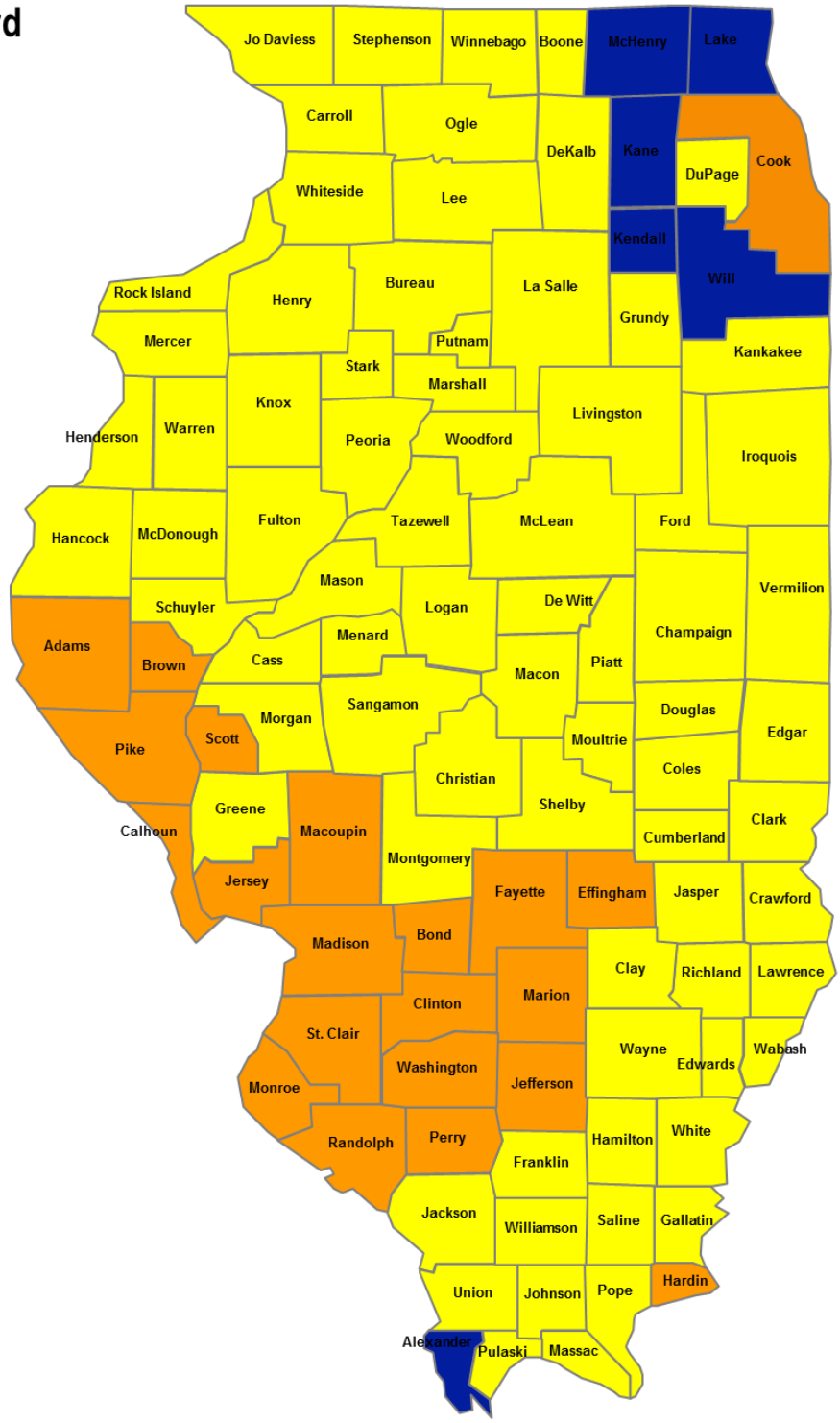
- Excessive Heat Watches – Issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours.

- Excessive Heat Warnings/Advisories – Issued when an excessive heat event is expected in the next 36 hours.

This warning action by NWS coupled along with the action now being taken by some of the larger cities initiating a system to contact and check on the elderly, will not prevent a heat wave but will significantly reduce the number of fatalities resulting from a heat wave. .

IEMA **Illinois Natural Hazard Mitigation Plan**

Extreme Heat Hazard Rating by County



Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

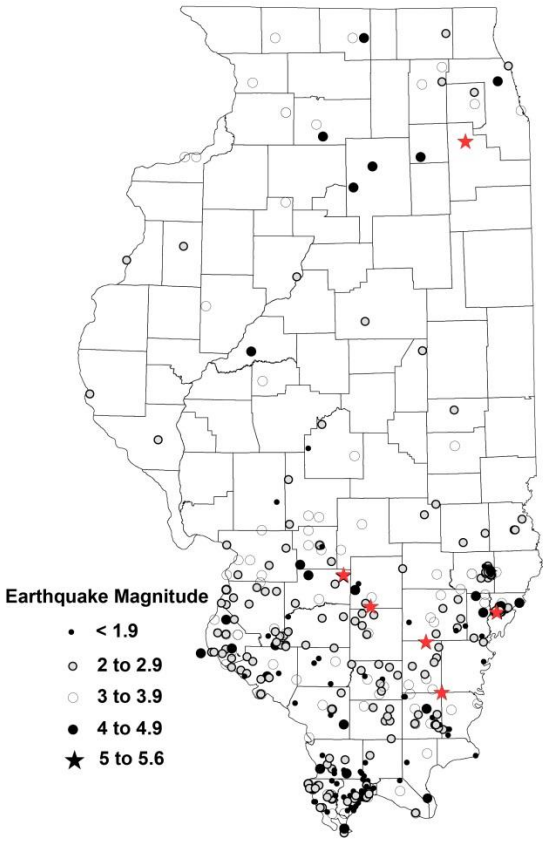
Calculations completed using data from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States. Data was obtained on a National Weather Service Zone by county basis

H. Earthquakes
By Robert A. Bauer & Timothy Larson

Introduction
Over 360 small to moderate earthquakes are known to have occurred in Illinois during the past two centuries. Of these, 32 caused at least some damage. Figure 1 shows the locations of these earthquakes within the state and Table 1 lists them by county. The larger earthquakes are shown with filled circles and stars. In addition, over 200 recorded events known to be either aftershocks or earthquake swarms are not included in this tally.

Earthquakes occur when rocks forming the Earth's crust slip past each other along a fault. This slippage occurs when the buildup of stresses get to the point that they are greater than the strength of the locked up section of rocks along the fault plane. When faulting takes place, the sudden release of energy produces vibrations or seismic (shock) waves that radiate from the main fault movements. These waves cause the shaking or "quaking" that lasts tens of seconds to a few minutes, depending on the magnitude of the event (energy released) and what kinds of rocks they travel through and the stiffness or lack of stiffness of the soils at a site. Where the faulting starts, at some depth below the Earth's surface, is the hypocenter (focus) of an earthquake. The point on the surface directly above the focus is the epicenter.

Earthquake measurement and observation
Magnitude and ***intensity*** are terms used to describe the severity of an earthquake, but they do not mean the same thing. ***Magnitude*** is a measure of the seismic energy released in the earthquake. It is calculated from measurements of the ground vibrations recorded by seismographs. Earthquake magnitudes are reported in logarithmic increments which means that a magnitude 7 earthquake has about 32 times greater energy than a 6 and an increase of 0.2 means twice as much energy was released. The Richter Scale is one of several variations of magnitude that are reported, each using a different formula to calculate the magnitude from the recorded vibrations (Bolt, 1993).



Earthquakes in Illinois originate within the crust at depths of 1 to 16 miles. Most of the Illinois earthquakes are located at depths below the layers of sedimentary rock where coal, oil, and crushed rock are mined. They occur in the granitic rocks far below the sedimentary layers of rock where known faults are mapped. The earthquake vibrations move out away from the point of origin (hypocenter or focus) through the bedrock and then up though the overlying soils on top of the bedrock. In the central part of the U.S., the bedrock is flat-lying, old, intact, and strong. Earthquake vibrations travel very far through material such as this in comparison to the young, broken, weak bedrock of the west coast. Because of this difference in bedrock, Central U. S. earthquakes are felt and cause damage over, an area 15 to 20 times larger than California earthquakes with similar magnitudes.

Figure 1. Earthquakes in Illinois from 1795 to 2013.

Intensity is an evaluation of the effects brought about by an earthquake, using the observations of people in the area affected. Intensities are based on descriptive reports, rather than calculated from instrument readings. In general, intensities decrease at greater distances from an epicenter. Intensities are influenced by the soils resting on bedrock. Thick, loose, saturated soils such as in river valleys may amplify earthquake ground motions and thus have higher intensities reported than just outside of the valley. Several formal intensity scales have been proposed for use in different parts of the world. In the U. S., earthquake intensities are reported using the twelve-point Modified Mercalli Intensity Scale (Wood and Neumann, 1931; Table 1), increasing from barely detectable to catastrophic. For any earthquake, there will be many intensities, depending on the location of observers - but only one magnitude.

MODIFIED MERCALLI INTENSITY SCALE

(abbreviated with corresponding estimates of ground motion as a percent of acceleration of gravity (g) and typical magnitude of earthquakes that might cause these intensities)

I. Not felt except by a very few under especially favorable conditions.

II. Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects swing.

III. Felt quite noticeably by persons indoors, especially on upper floors of buildings. **Many people do not recognize it as an earthquake. Vibrations are similar to the passing of a truck.**

IV. Felt indoors by many, outdoors by few during the day. **At night, some awakened**. Dishes, windows, rattled but not broken doors swing, walls make cracking sound. Sensation like heavy truck **striking building**. 1.5% to 4% *g* M~3.5

V. Felt by nearly everyone; many awakened. **Some dishes, windows broken, plaster cracked. Unstable objects overturned.** 4% to 9% g

VI. Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster and cracked chimneys. damage slight. 9% to 18% *g*; M~4

VII. Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken. 18% to 34% *g*

VIII. Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with **partial collapse.** Damage great in poorly built structures. **Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned**. 34% to 65 % *g*; M~6

IX. Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. **Buildings shifted off foundations.** 65% to 124% *g*

X. Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent slightly. >124% *g*; M~8

XI. Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.

XII. Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Table 1. Modified Mercalli Intensity Scale Acceleration estimates from Bolt, 1993, magnitude estimates from Heigold and Larson, 1990 and accelerations from Wald et al., 1999.

Many of the 364 Illinois earthquakes have very small magnitudes of 2 to 4 that don't cause much damage, but are felt over large areas. Larson (2001) documented the effects of one of these small earthquakes from north-central Illinois. Over 500 people responded to a questionnaire published in local newspapers. Their recollections of the earthquake (magnitude 3.5, centered near Amboy, southeast of Dixon) fit surprisingly well into the Modified Mercalli Scale. Those criteria on Table 1 most helpful in distinguishing between intensity levels are shown in bold typeface (see also Stover and Coffman, 1993). Many people throughout the area that felt the earthquake did not recognize it as such, but attributed the sharp vibrations to an errant quarry blast or the passing of a particularly loud vehicle (Intensity III). Closer to the epicenter, many people reported the sensation of something striking the house, or falling onto it (Intensity IV). Others reported dishes and windows rattling, but not breaking (Intensity IV).

The first modern seismograph network was established in the Central US in the 1960's (Heigold and Larson, 1990). Prior to that time, most of our records of earthquakes are based on newspaper accounts and personal journals. Magnitudes of these older earthquakes can be estimated by comparing their intensities with the intensities from recent earthquakes that have known magnitudes. Magnitude estimates can be based on the maximum intensity of the earthquake (Nuttli and Herrmann, 1978) or by the area over which the earthquake was felt (Sibol et al., 1987).

Damage to buildings, highways, power lines, pipelines and other structures only partly depend on the amount of energy released during the earthquake. Certain kinds of earth materials resting on the bedrock amplify the earthquake ground motions. In Illinois, structures built on thick, loose sediments of river flood plains are more likely to be damaged than structures on glacial till (stiff, pebbly clay) or bedrock. In fact, seismic intensity may increase one or more units on the Modified Mercalli Intensity Scale, if loose sediments are present. Also, loose sandy sediments with high moisture content can turn to liquid – quick sand type state - (liquefaction) when shaken enough.

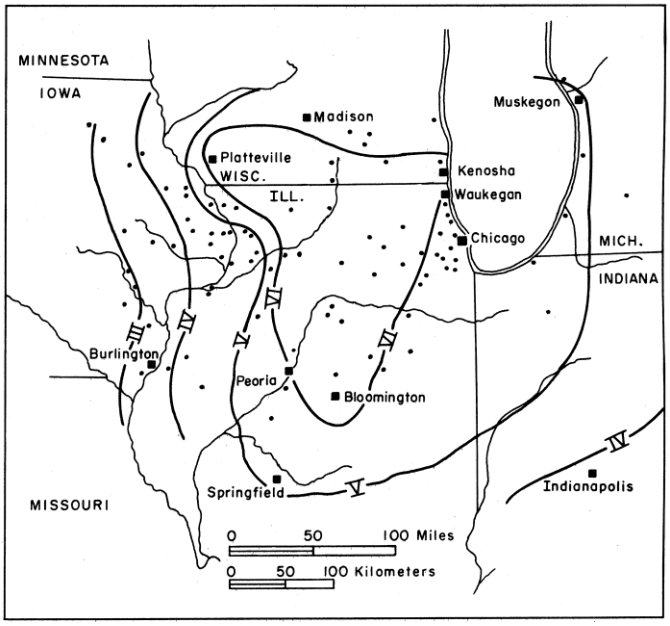


Figure 2. Intensity distribution from the 1909 earthquake in northern Illinois. Modified from Udden, 1910.

Historical Data

Earthquakes in Illinois

Of the 364 earthquakes shown on figure 1, 84 percent occur in the southern third of the State, south of latitude 39° N. Eight percent of the earthquakes (28) occur in the central part of the state between latitudes 39°N and 41° N and another eight percent (28) are located in the northern part of the state, north of latitude 41°N.

Northern Illinois: Fire at Aurora

One of the largest historical earthquakes in Illinois occurred in northern Illinois on May 26, 1909. The exact location of the magnitude 5.1 (estimated) earthquake isn't known, but the largest intensities occurred in and near Aurora where many chimneys fell, a stove overturned, gas lines broke, and a fire started. Although considerable excitement ensued, the Aurora Fire was quickly extinguished and soon forgotten. Elsewhere, houses were jostled out of plumb in Beloit, Wisconsin and brick walls cracked as far away as Bloomington. The area encompassed by minor damage is shown in Figure 2. This map is modified from one originally constructed by Prof. J. A. Udden of Augustana College, Rock Island, who based it on a compilation of newspaper reports. (Udden, 1910; Heigold 1972). A somewhat smaller earthquake occurred nearby in 1912.

A magnitude 4.0 earthquake centered in north-central Illinois south of Rockford, near the village of Amboy woke many Chicago area residents when it struck late at night on September 15, 1972 (figure 3, Heigold, 1972). Although felt over a very large area, the intensity VI area is much smaller than the 1909 earthquake.

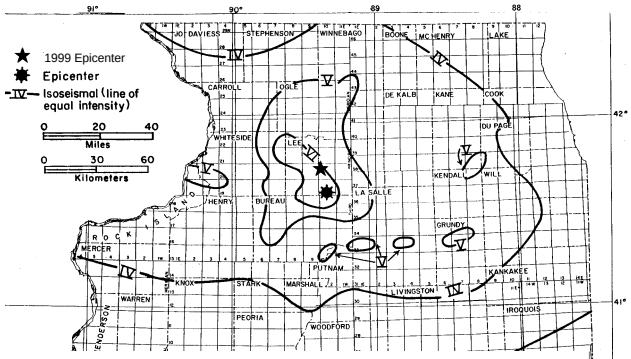
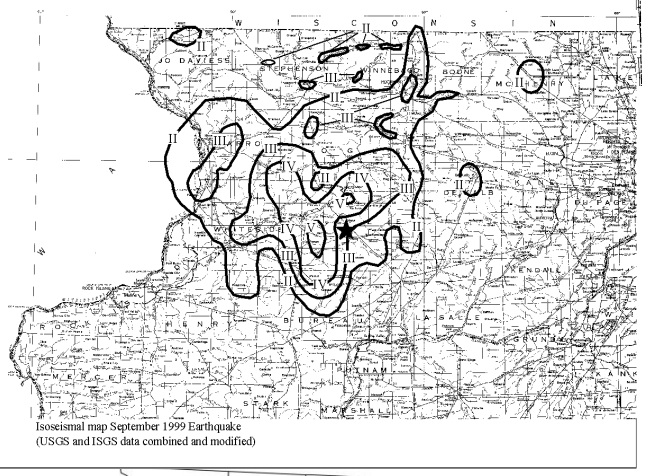


Figure 3. Intensity distribution from the 1972 earthquake in northern Illinois, from Heigold, 1972.

Twenty-seven years later on September 2, 1999, a magnitude 3.5 earthquake occurred at nearly the same location as the 1972 earthquake. An isoseismic map (figure 4) prepared from responses to questionnaires distributed to Post Offices and published in local papers indicated that the greatest intensities were several miles northwest of the epicenter as located by regional seismographs (Larson, 2001). This area also experienced a 4.2 magnitude event on June 28, 2004 which was felt in six states.



Several small earthquakes occurred in the Rock Island area in the 1930's (Fryxell, 1940; Heigold, 1972). Two that were centered in Illinois are shown in figure 1. Others occurred in Iowa.

Figure 4. Intensity distribution from the 1999 earthquake in northern Illinois, from Larson, 2001.

Chicago area: Earthquakes occur throughout the state with most in the southern third of the state but 15 events have been recorded in Cook, DuPage, Kane, Kendall, and Will Counties since 1804 (figure 5). Recently, a 3.8 magnitude earthquake struck on February 10, 2010, about 2 miles northwest of Lily Lake in Kane County. This earthquake was located about 6 miles below the ground surface deep down within the granites.

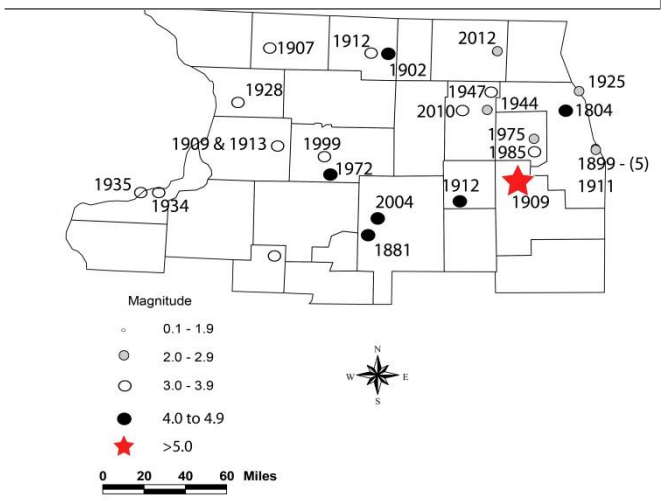


Figure 5. Historical earthquakes and their location in Northern Illinois from 1804 to 2013.

Central Illinois: Burglars in the basement For the most part, central Illinois is characterized by a lack of earthquakes. The largest known earthquake in central Illinois occurred about 11:00 PM on July 19 1909, between Petersburg and Havana. With an estimated magnitude of 4.8, this earthquake damaged chimneys and broke windows. Many residents were awakened and congregated outside after the unusual event. The St. Louis Post Dispatch reported "several who had gone to bed before the tremor arrived report that they experienced a vague Pullman train car type berth sensation."

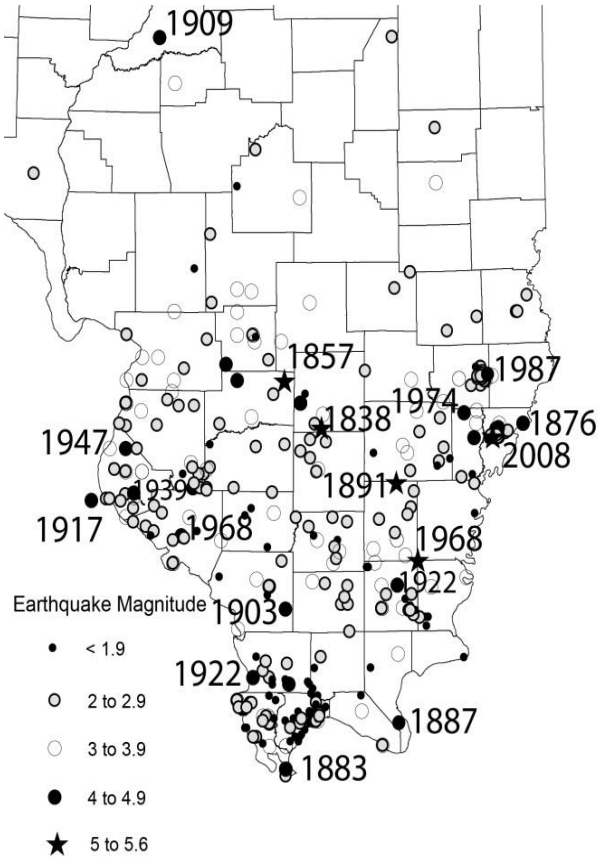


Figure 6. Earthquake epicenters in southern Illinois. Years indicated for the larger events.

Southern Illinois: Minor damage

Nearly two dozen damaging earthquakes have been reported in southern Illinois (figure 6), although seldom is the damage more severe than fallen chimneys, broken windows or cracked masonry walls. The largest earthquake in the Central US since 1895 occurred in southeast Illinois on April 18, 2008. The magnitude 5.4 event caused damage to 240 structures in Illinois with 3 condemned according to the county emergency managers (figure 7). Damage in Illinois and Indiana covered a 20 to 30 mile radius from the epicenter located about 4 miles northwest of Mt. Carmel, Illinois. Other buildings were condemned in Indiana.

Figure 7. Mt. Carmel, Illinois magnitude 5.23 earthquake damage to 1904 school building that was converted to apartments. Building condemned on day of earthquake and razed 1.5 years later. ISGS photo.

The largest earthquake during the 20th Century occurred in southeast Illinois on November 9, 1968. This magnitude 5.3 earthquake caused Intensity VII damage in the epicentral area northeast of Harrisburg. Fifteen percent of the chimneys in a 25-mile radius of the epicenter were damaged, foundations cracked and bricks were thrown from masonry parapets. The earthquake was felt by people in multi-story buildings as far away as Boston, Massachusetts. Also walls and chimneys fell in St. Louis 110 miles away. Figure 8 shows the extent of the damaged area and the felt area for this earthquake (Gordon et al., 1970).

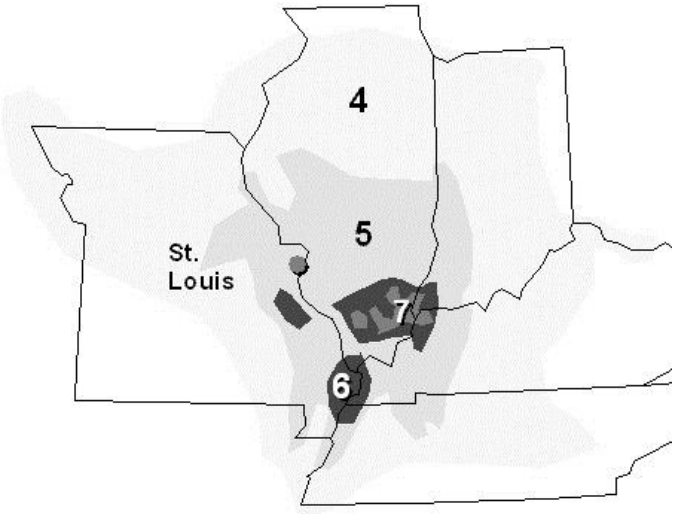
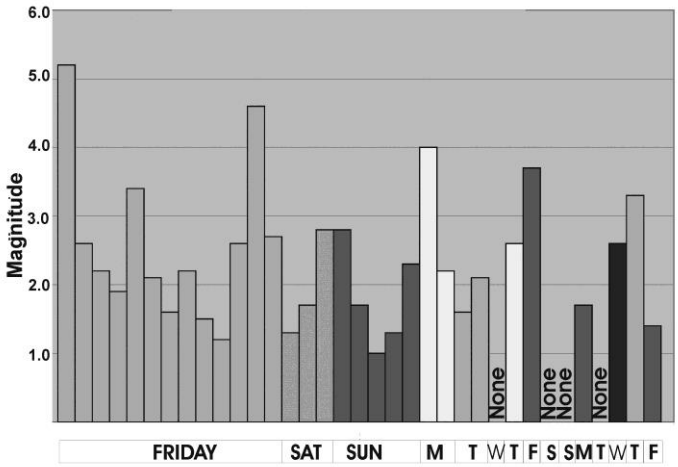


Figure 8. Reported intensities from the 1968 earthquake in southern Illinois, from Gordon et al 1970.

A magnitude 4.9 earthquake near Lawrenceville in 1987 is typical of the 18 other magnitude 4 or greater earthquakes in southern Illinois. It caused minor damage in the area and was felt throughout the Midwest. Diagonal cracks in masonry walls and loosened bricks shown in figure 9 are common examples of the minor damage that can occur in these earthquakes.

Figure 9. Typical minor damage (Modified Mercalli Intensity VI to VII) from Illinois earthquakes. Left: diagonal masonry cracks in church tower, Lawrenceville M 4.9 earthquake 1987. Below: bricks thrown from chimney in Lawrenceville by M 4.9 earthquake, 1987. ISGS photos

Short descriptions of the effects from the larger earthquakes in Illinois can be found in Stover and Coffman, (1993). The USGS maintains a complete catalog of earthquakes in the Eastern, Central and Mountain States of the U S from 1530 to 1986 (modified from Stover et al., 1984). A combination of these two listings was used to compile figure 1.



Aftershocks and Swarms

The April 18, 2008 Mt. Carmel earthquake reminds us that larger earthquakes often have aftershocks for many months following the main shock. Portable recorders placed near the Mt. Carmel event recorded 121 aftershocks within the first 5 days following the day of the earthquake. Figure 10 shows the larger aftershocks recorded during the first 2 weeks by permanent seismograph stations near Mt. Carmel. These aftershocks follow the typical sequence of fewer and fewer aftershocks per day with lower magnitudes than the main shock. A magnitude 2.4 and 3.6 occurred in 2009 and 2012 respectively within the hypocenters of all the aftershocks.

Figure 10. Diagram shows the magnitude and number of aftershocks following the main shock (first event on diagram) recorded within the first 2 weeks by nearby seismograph stations for the Mt. Carmel, Illinois April 18, 2008 earthquake..

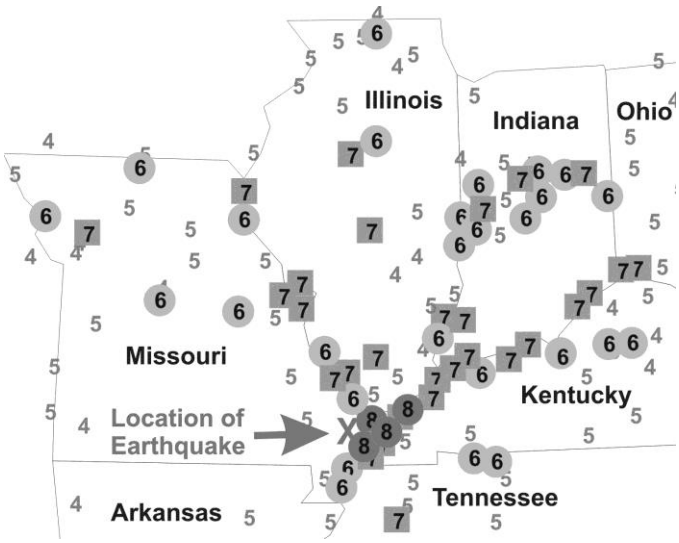
Several earthquake swarms have been recorded in Illinois. The most notable was a series of over 140 small earthquakes centered near Olmsted in Pulaski County during the winter of 1983-1984.

Regional earthquakes

During the winter of 1811-1812 a series of 4 very large (magnitude greater than 7.0) occurred along the 3 separate faults in the New Madrid seismic zone. Within the 3 months of these large main shock earthquakes, over 1,900 aftershocks were recorded with five estimated at magnitude 6.7, ten similar in magnitude to the Charleston, Missouri 1895 magnitude 6.3 event, and 65 similar to the Mt. Carmel 5.4 magnitude event. These earthquakes were centered in the New Madrid area of Missouri, south and southwest of Illinois, where they caused severe damage. In 1811-1812, frightened settlers living along the Ohio, Wabash and Mississippi Rivers reported various types of liquefaction, such as sand blows, fissures, bank collapse, in the bottom lands of these river valleys. Evidence of liquefaction from several pre-historic earthquakes from New Madrid have shown that 1811-1812 sequence of earthquake events occurred about 1450 A.D, 900 A.D. and 300 A.D. The shortest interval between these events is about 350 years and the longest about 600 years (Tuttle & Schweig 1995 and Tuttle 2001) with magnitudes from 7 to 7.6. Liquefaction features along the Wabash Valley Fault Zone demonstrates that large earthquakes have occurred from about 2,000 to 12,000 years ago (Obermeier et al., 1992 and Munson and Munson, 1996). Some of these recent investigations, estimated several of the earthquake magnitudes to be 6.2 to 7.3 based on aerial extent of liquefaction features of similar age (Olson et al. 2005).

Other moderately large earthquakes have occurred in surrounding states. The most notable was one that struck in Missouri, just west of Cairo, Illinois on Halloween morning October 31 1895. This earthquake, with an estimated magnitude 6.2, broke hundreds of chimneys and plate glass windows in Cairo. This is the same event that caused many central Illinois residents to check for burglars in their basements. The Intensity in the Chicago area varied from IV to V. No severe damage was reported and many people did not feel the earthquake. The area damaged by this earthquake is shown in figure 11. As expected, this area tends to follow the major river valleys that are filled with thick, loose, sediments.

Figure 11. Intensities reported per town from the "Halloween Earthquake" of 1895. From Bakun et al., 2002.



Magnitude 6.8 anywhere - Intensity VIII - IX

A recent study of earthquakes around the world within stable interior parts of continents show that earthquakes with magnitudes up to 6.8 can occur anywhere in these settings. A magnitude 6.8 event would produce intensities of VIII to IX.

Earthquake Risk and Hazards

Although there have been over 560 earthquakes in Illinois during the last two centuries, only very few of them have caused any damage (Modified Mercalli Intensity of VI or higher) or injuries. Larger earthquakes in the New Madrid region have caused more damage in Illinois than earthquakes originating in Illinois. The risk of probable damage from future earthquakes can be estimated based on the historical record of past earthquakes. Petersen et al., 2008 and colleagues at the USGS have created maps for building codes of the largest probable ground shaking that have a low probability of being exceeded over a 50 year period (figure 12). They have plotted intensity information as numerical values of ground shaking, or accelerations. These values can be converted to Modified Mercalli Intensities using the conversion values in Table 1. These USGS maps only show the estimate of shaking on the top of bedrock. Shaking will be modified by the overlying soils.

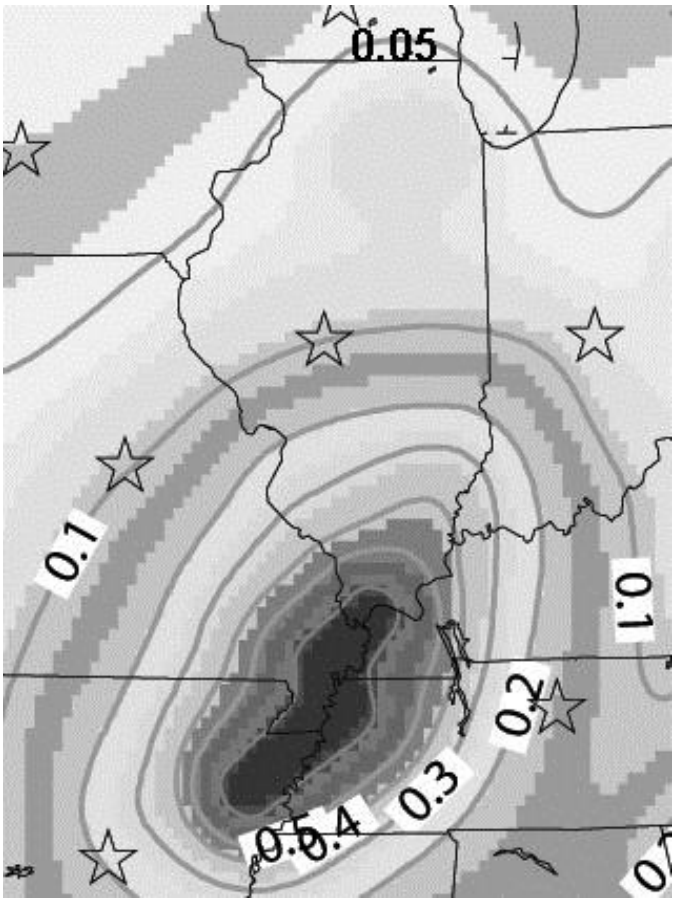


Figure 12. Earthquake risk for Illinois given as maximum accelerations with a 2% probability of being exceeded within a 50 year window. From Petersen et al., 2008 and the USGS National Seismic Hazards Mapping Project Web page). Stars are location of state capitals.

For most of Illinois, the risk is dominated by the possibility of large earthquakes recurring in the New Madrid Seismic Zone, south of Illinois. In this scenario, the maximum accelerations in the southern-most counties of Illinois exceed 60 percent of gravity, or Modified Mercalli Intensity IX. Although the risk decreases to the north, there is a 2 % probability during the next 50 years that an acceleration greater than 10 percent of gravity (Modified Mercalli Intensity VI) could be exceeded in any of the southern half of Illinois. Because of the record of minor to moderate earthquakes in northern Illinois, west of Chicago, the risk of damaging earthquake motions increases in the western suburbs of Chicago. But if magnitude 4 to 5 earthquakes occur near or under Chicago as early events have been located, damage could occur to weak, old structures through other parts of the city.

Earthquakes create numerous risks in people's homes. People can lessen the severity of earthquake damage by identifying hazards that exist in their homes, schools, or places of business and then systematically removing or correcting each hazard. This is especially important in the southernmost counties of Illinois where the earthquake risks are the greatest. Some common hazards include: free standing water heaters, stoves, and other gas or electric appliances which could move or fall during an earthquake; bookshelves or filing cabinets which are free standing or bookshelves with objects stored above head level; water or gas pipes which are not fastened well to walls or ceiling.

Some other things that people can do to make their homes more earthquake ready include: keeping a few days supply of food and water available; being sure each home has a fire extinguisher and smoke alarm; maintaining a properly equipped first aid kit complete with any necessary prescription medication in sufficient quantities to last a few days to a few weeks; organizing and testing a family emergency plan

which would help ensure each family member's survival; having residents know how to turn off gas supply to building.

Should you be involved in an earthquake remembering a few simple facts can greatly increase your chance of survival and can help to reduce possibility of serious injury. If inside a building: stay inside and duck, cover, and hold. Protection inside a building is found next to or under heavy furniture. Do not run outside of a building during the shaking. Falling parts (bricks and glass) of buildings can kill or injure you. Rooms with lots of fixtures (hanging lights within a dropped ceiling) can be dangerous if they fall. Large windows or groups of windows can shatter and shards of glass can fly inward. These areas should be avoided. Large rooms with open-span ceilings or roofs are the most vulnerable to collapse and should be avoided. Many suggested actions and checklists to be used to secure your home and be prepared can be found at state and federal websites www.ready.illinois.gov or www.ready.gov and the Red Cross.

The following table provides the number of past earthquakes from 1795 to mid-2013, by county, that were of a magnitude that could be felt or cause possible damage. These numbers do not represent the total recorded earthquakes per county since some counties have had large numbers of small events that were not detected by people. Earthquakes recorded prior to about 1955 utilized estimated magnitudes and locations for the events based on damage amounts and location. Damage from earthquakes would become evident in magnitudes in the mid-4s and higher. The larger magnitude events listed in this table would also influence neighboring counties. As seen in the table, 63 out of the 102 counties in Illinois, approximately 62%, have experienced earthquakes of a magnitude that could be felt by the public.

COUNTY	FELT Magnitudes 2 to 2.9	FELT Magnitudes 3 to 3.9	SOME POSSIBLE DAMAGE Magnitudes 4 to 4.9	SOME POSSIBLE DAMAGE Magnitudes 5 to 5.4	COUNTY	FELT Magnitudes 2 to 2.9	FELT Magnitudes 3 to 3.9	SOME POSSIBLE DAMAGE Magnitudes 4 to 4.9	SOME POSSIBLE DAMAGE Magnitudes 5 to 5.4
Adams	1				Marion	1	5	1	1
Alexander	21	21	4		Mason			1	
Bond	2	4	1		Massac	1	2		
Carroll		1			McHenry	1			
Christian	1	1			McLean	1	1		
Clay	1	1			Menard		1		
Clinton	2	1	1	1	Monroe	9	6	2	
Coles	1	1			Montgomery	2	2		
Cook	1	6	1		Peoria	1			
Crawford	3	1			Perry	2	2		
Douglas	1				Piatt	1			
Du Page	1	1			Pike	1			
Edwards	1	1	2		Pope		1	1	
Effingham	2				Pulaski	33	5		
Fayette		2			Randolph	9	4	1	
Franklin	7	3			Richland	19	5	1	
Fulton		1			Rock Island		2		
Gallatin	1	3			Saline	6	5	2	
Hamilton	4	4		2	St. Clair	15	9	1	
Hardin					Stark		1		
Henderson	1				Stephenson		1		
Jackson	2	3	2		Union	4		3	
Jasper	2				Wabash	15	5	4	1
Jefferson	5	1			Warren	1			
Johnson	2				Washington	6	1		
Kane	1	2			Wayne	6	4		
Kendall			1		White	2			
LaSalle			2		Whiteside		2		
Lawrence			1		Will				1
Lee		1	1		Williamson	6	1		
Macoupin		1			Winnebago		1	1	
Madison	5	4							

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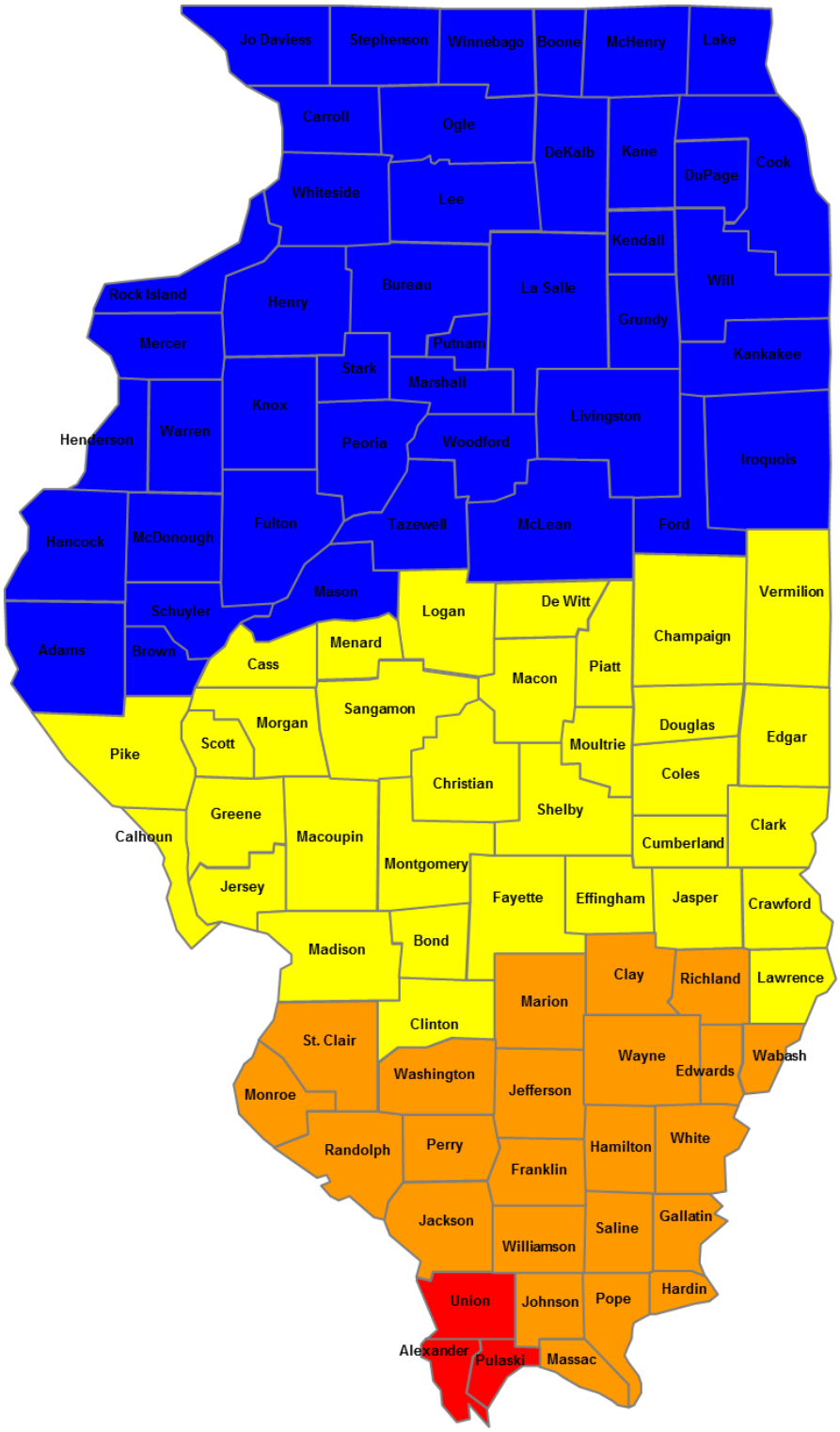
IEMA

Illinois Natural Hazard Mitigation Plan

Earthquake Hazard Rating by County



Hazard Rating

- Severe
- High
- Elevated
- Guarded
- Low

COMPREHENSIVE SEISMIC LOSS MODELING FOR THE STATE OF ILLINOIS INTRODUCTION

This is a summary of only a few highlights from an earthquake loss estimation that was performed for the entire State of Illinois using HAZUS and its accompanying default data and also performed for the southernmost 32 counties of Illinois using HAZUS and updated, detailed inventories, a soil site class map and liquefaction susceptibility map (Elnashai 2007). This estimate was performed by the Mid-America Earthquake Center (MAE-Center) located at the University of Illinois with assistance from staff at Georgia Institute of Technology, Illinois State Geological Survey and the Illinois Emergency Management Agency. These estimates were run using three different earthquake scenarios of a moment magnitude 7.7 and 6.3 near the northern end of the New Madrid seismic zone and a magnitude 7.1 for the Wabash Valley seismic zone, all analyzed for damage inflicted from Peak Ground Acceleration (PGA)and spectral accelerations at 0.2 and 1.0 seconds. The ground shaking at different "frequencies" of 0.2 and 1.0 seconds impacts structures of different heights, lengths and type of construction.

State-Wide Estimate with Default Data

The Federal Emergency Management Agency sponsored HAZUS (Hazards US) computer loss estimation program comes with default data of building and some infrastructure inventory from various sources including the 2000 census. It uses one type of soil for the entire area. Soils modify the earthquake ground motions that travel through the bedrock and typically amplify the ground motions, increasing shaking at the ground surface as compared to the shaking on the bedrock. The default building inventory contains numbers of structures by construction type per census track and replacement costs for structures are based on an average cost per square foot for 2002. It contains an inventory of essential facilities such as: hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities and high potential loss facilities such as: dams, levees, military installations, nuclear power plants and hazardous material sites.

Detailed Analysis of Southern 32 Counties

HAZUS was also used to estimate losses for the southernmost 32 counties in Illinois using updated, detailed information wherever possible. HAZUS default inventory data was improved using a previous MAE-Center essential facility inventory and computerized tax parcel data from cooperating counties in the 32 county area. Building replacement costs were modified to reflect current replacement costs. HAZUS uses damage functions (fragility curves) that estimate the level of damage per structure type per the level of shaking. The HAZUS default functions are meant to be used across the entire country. This project developed and used specific fragility curves for the Midwest for the different building and bridge types located in this part of the country. Also detailed soil site class and liquefaction susceptibility maps were developed and used for this project. These maps are used to estimate how much soils will amplify earthquake ground motions. For essential/critical facilities with known latitude and longitude locations, the HAZUS program will use the specific soils information below the structure for the analysis.

STATE-WIDE ESTIMATE WITH DEFAULT DATA

State-Wide Damage for Magnitude 6.3 New Madrid Event

HAZUS estimates that 4,453 buildings will sustain at least moderate damage and of those 1,689 will be completely damaged. No essential facilities are expected to be completely damaged and a large percentage will be functional on the day of the event. It is estimated 6,321 households will be without potable water and 3,964 without electricity on the day of the event. Eight of the 22,854 bridges in Illinois are expected to be completely damaged along with two ferry facilities. Debris generated is estimated to be 219,000 tons. Displaced households are 1,882 with 556 requiring shelter. There are 540 casualties and a total direct economic impact of about $920 million.

State-Wide Damage for Magnitude 7.7 New Madrid Event

HAZUS estimates that 75,272 buildings will sustain at least moderate damage and of those 19,044 will be completely damaged. Forty-two essential facilities are expected to be completely damaged including two hospitals and many facilities will need a few days to a month to recover to functionality. It is estimated 100,483 households will be without potable water and 25,191 without electricity on the day of the event. Sixty-two of the 22,854 bridges in Illinois are expected to be completely damaged along with two ferry facilities and one airport. Debris generated is estimated to be 3,377,000 tons. Displaced households are 22,468 with 6,556 requiring shelter. There are 7,629 casualties and a total direct economic impact of about $9 billion.

State-Wide Damage for Magnitude 7.1 Wabash Valley Event

HAZUS estimates that 32,036 buildings will sustain at least moderate damage and of those 6,428 will be completely damaged. Thirty-one essential facilities are expected to be completely damaged including one hospital and many facilities will need a few days to a month to recover to functionality. It is estimated 19,137 households will be without potable water and 20,233 without electricity on the day of the event. Ninety-eight of the 22,854 bridges in Illinois are expected to be completely damaged along with two ferry and two airport facilities. Debris generated is estimated to be 1,279,000 tons. Displaced households are 6,927 with 1,755 requiring shelter. There are 2,389 casualties and a total direct economic impact of about $4.6 billion.

DETAILED ANALYSIS FOR SOUTHERN 32 COUNTIES IN ILLINOIS

32 County Damage for Magnitude 6.3 New Madrid Event

HAZUS estimates that 4,303 buildings will sustain at least moderate damage and of those 1,858 will be completely damaged. A few essential facilities show moderate damage and none are expected to be completely damaged. It is estimated 6,321 households will be without potable water and 3,964 without electricity on the day of the event. Four bridges in the 32 counties are expected to be completely damaged. Displaced households are 1,884 with 555 requiring shelter. There are 540 casualties and a total direct economic impact of about $930 million.

32 County Damage for Magnitude 7.7 New Madrid Event

HAZUS estimates that 71,263 buildings will sustain at least moderate damage and of those 20,386 will be completely damaged. Twenty-nine essential facilities are expected to be completely damaged including one hospital. It is estimated 100,483 households will be without potable water and 25,191 without electricity on the day of the event. Eighty of the 5,197 bridges in the 32 counties are expected to be completely damaged along with 1 airport. Debris generated is

estimated to be 3,332,000 tons. Displaced households are 22,454 with 6,552 requiring shelter. There are 7,591 casualties and a total direct economic impact of about $8.5 billion.

32 County Damage for Magnitude 7.1 Wabash Valley Event

HAZUS estimates that 29,369 buildings will sustain at least moderate damage and of those 6,663 will be completely damaged. No essential facilities are expected to be completely damaged. It is estimated 19,137 households will be without potable water and 20,233 without electricity on the day of the event. One hundred and four of the 5,197 bridges in the 32 counties are expected to be completely damaged along with two airport facilities. Debris generated is estimated to be 1,211,000 tons. Displaced households are 7,016 with 1,752 requiring shelter. There are 2,344 casualties and a total direct economic impact of about $4.3 billion.

Some of the impact numbers are the same for the state-wide assessment and the detailed 32 county analysis because the 32 counties are the closest to the earthquake epicenter and damage levels north of these counties for the state-wide assessment were small for some magnitude scenarios. The detailed report also contains information on estimates of how soon functions would be restored to various utilities and facilities and also information on many more infrastructure systems.

Elnashai, Amr, 2007, Comprehensive Seismic Loss Modeling for the State of Illinois: Mid-America Earthquake Center Report for the Illinois Emergency Management Agency.

Loss Estimation for Earthquakes

The more detailed county by county analysis can be viewed in the 2007 Plan Update supporting documentation CD. This document is attached for the reason that it is very lengthy and extremely detailed. This detailed loss estimation data was reviewed during the update process. No further information of additional data would be able to equal or surpass the detailed estimates that were obtained from the HAZUS analysis in 2007.

Figure 1: "Comprehensive Seismic Loss Modeling of the State of Illinois" Mid-America Earthquake Center, University of Illinois Urbana-Champaign

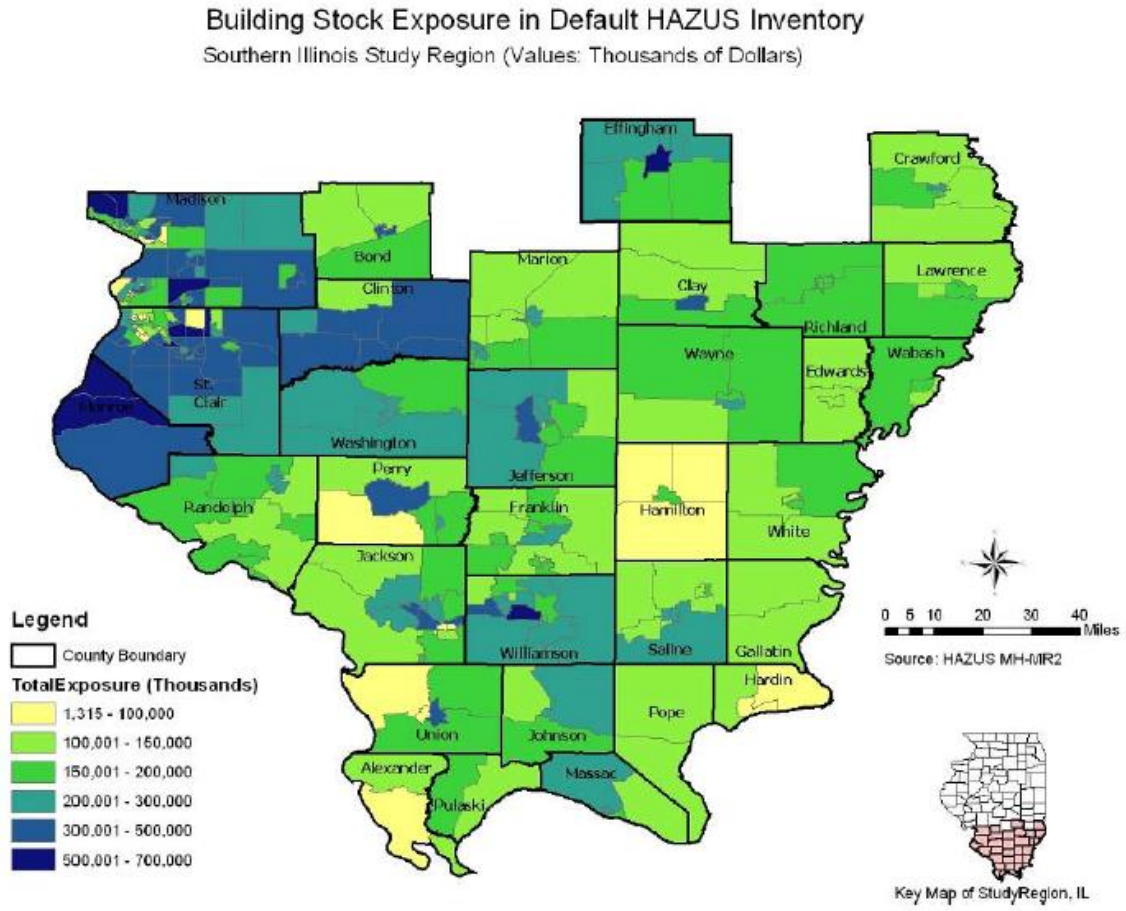


Figure II-13 – Building stock Exposure in Southern Illinois Regions (Thousands of $)

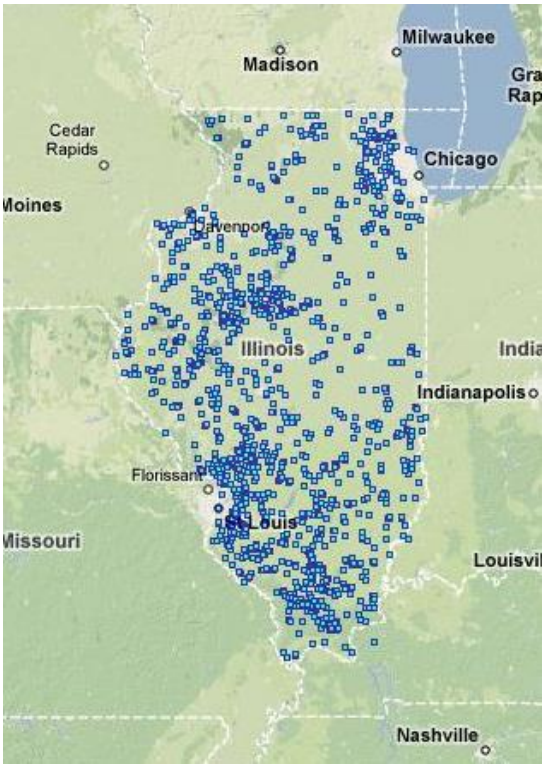
I. Other Natural Hazards

As stated in the opening paragraph of this section, the Illinois Natural Hazard Mitigation Planning Committee divided potential natural hazards into three categories: those extremely unlikely to occur in Illinois, those with low probability and minimal impact, or natural hazards that have in the past and in all probability will continue to impact Illinois at various levels of severity and frequency. The preceding pages have dealt with disasters that will most definitely occur in Illinois. This portion of the plan will discuss the remaining two categories.

The first category is natural hazards that are extremely unlikely to happen in Illinois: avalanche, coastal storm, hurricane, tsunami and volcano. No mitigation actions or hazard profiles will be discussed regarding these hazards.

The second category is natural hazards that have a low probability of occurring or minimal impact. These secondary hazards to be discussed include: Dam failure, Mine Subsidence, and Pandemic.

The intent for future plan updates is to include a loss estimation model for the "Other Natural Hazards." Currently, data is not available to provide accurate estimates. Currently, no mitigation efforts have been discussed as these hazards are very difficult to predict where the next event could take place. However, with recent occurrences and the potential of risk, the planning committee determined that these hazards should be identified in the INHMP and evaluated utilizing the plans monitoring and update cycle to New to the 2013 Hazard Mitigation Plan is the addition of Pandemic to the "Other Natural Hazards." Recent occurrences, combined with increased losses have made this hazard worth noting. Currently, no mitigation efforts have been discussed as it is very difficult to predict where the next event could take place.



Dam Failure:

Dam failure is an accidental or unintentional collapse or other failure of an impoundment structure that results in downstream flooding. Dams are man-made structures and dam failures are usually considered technological hazards, however, these failures are usually caused by prolonged periods of rainfall and flooding.

A dam is a barrier constructed across a watercourse in order to store, control, or divert water. Dams are usually constructed of earth, rock, concrete, or mine tailings. The water impounded behind a dam is referred to as the reservoir and is measured in acre-feet, with one acre-foot being the volume of water that covers one acre of land to a depth of one foot. Due to topography, even a small dam may have a reservoir containing many acre-feet of water. A dam failure is the collapse, breach, or other failure

of a dam that causes downstream flooding. Dam failures may result from natural events, human-caused events, or a combination thereof. Due to the lack of advance warning, failures resulting from natural events, such as hurricanes, earthquakes, or landslides, may be particularly severe. Prolonged rainfall that produces flooding is the most common cause of dam failure [FEMA, 1997].

Nature of the Hazard

Dam failures usually occur when the spillway capacity is inadequate and water overtops the dam or when internal erosion through the dam foundation occurs [also known as piping]. If internal erosion or overtopping cause a full structural breach, a high-velocity, debris-laden wall of water is released and rushes downstream, damaging or destroying whatever is in its path. Dam failures may result from one or more the following:

- Prolonged periods of rainfall and flooding [the cause of most failures];
- Inadequate spillway capacity which causes excess overtopping flows;
- Internal erosion due to embankment or foundation leakage or piping;
- Improper maintenance;
- Improper design;
- Negligent operation;
- Failure of upstream dams;
- Landslides into reservoirs;
- High winds; and
- Earthquakes.

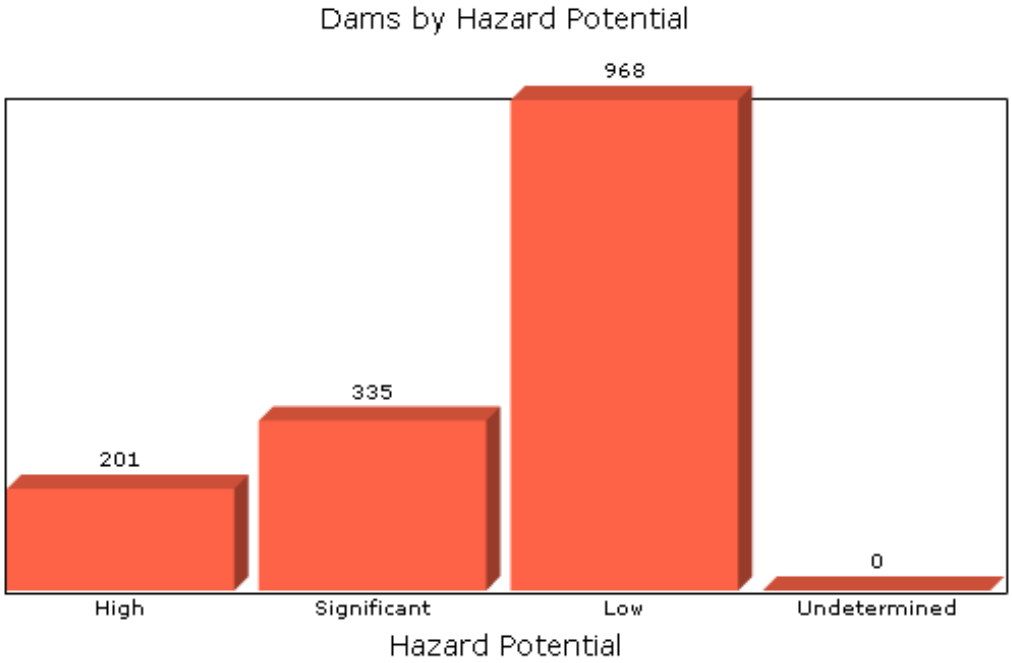
For emergency planning purposes, dam failures are categorized as either *rainy day* or *sunny day failures. Rainy day failures* involve periods of excessive precipitation leading to an unusually high runoff. This high runoff increases the reservoir of the dam and if not controlled, the overtopping of the dam or excessive water pressure can lead to dam failure. Normal storm events can also lead to rainy day failures if water outlets are plugged with debris or otherwise made inoperable. *Sunny day failures* occur due to poor dam maintenance, damage/obstruction of outlet systems, or vandalism. This is the worst type of failure and can be catastrophic because the breach is unexpected and there may be insufficient time to properly warn downstream residents.

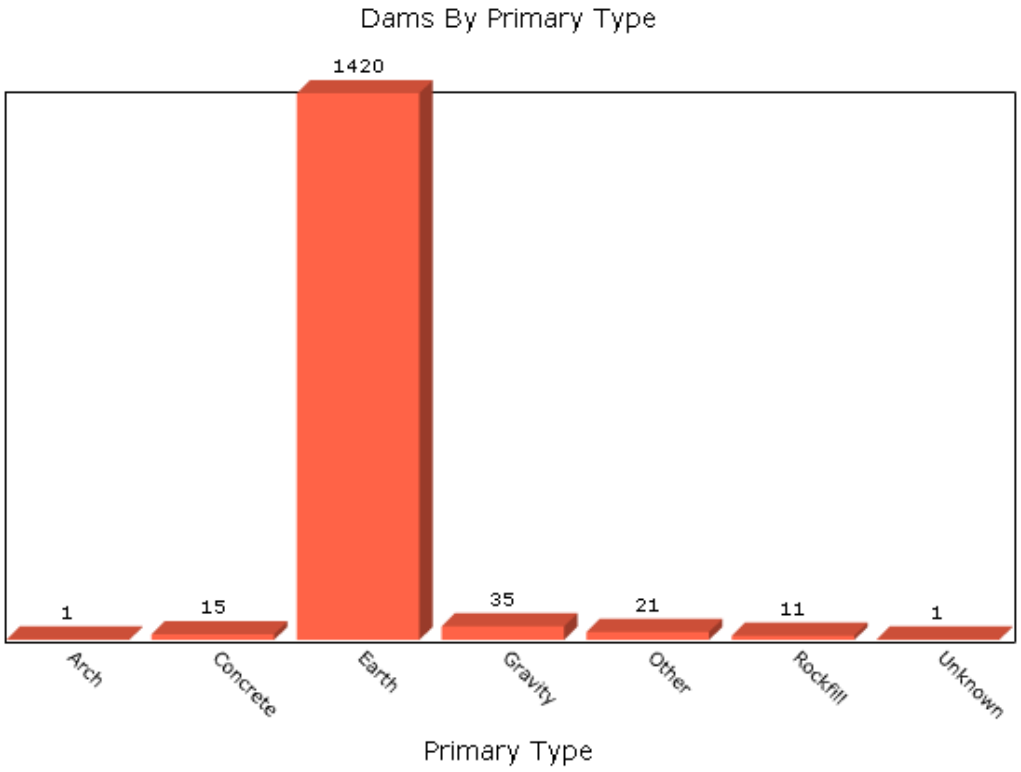
Previous History of Dam Failure

A request for Dam information was made for failure events prior to 1990. The official collection of this data began post 1990 so no accurate records exist today. Another request was made to discover what dam failures resulted from the historic 1993 and 2008 flood events. It was determined that no regulated dams failed during these events.

According to the National Inventory of Dams, the State of Illinois has 1504 Dams. More than 60% of those Dams are considered very low in terms of Hazard Potential. In fact, less than 15% are considered to represent a high risk to the population they protect. The following images define this more clearly.

For more information and current analysis, please refer to the following website, http://geo.usace.army.mil/pgis/f?p=397:3:1577842890320650::NO::P3_STATES:IL

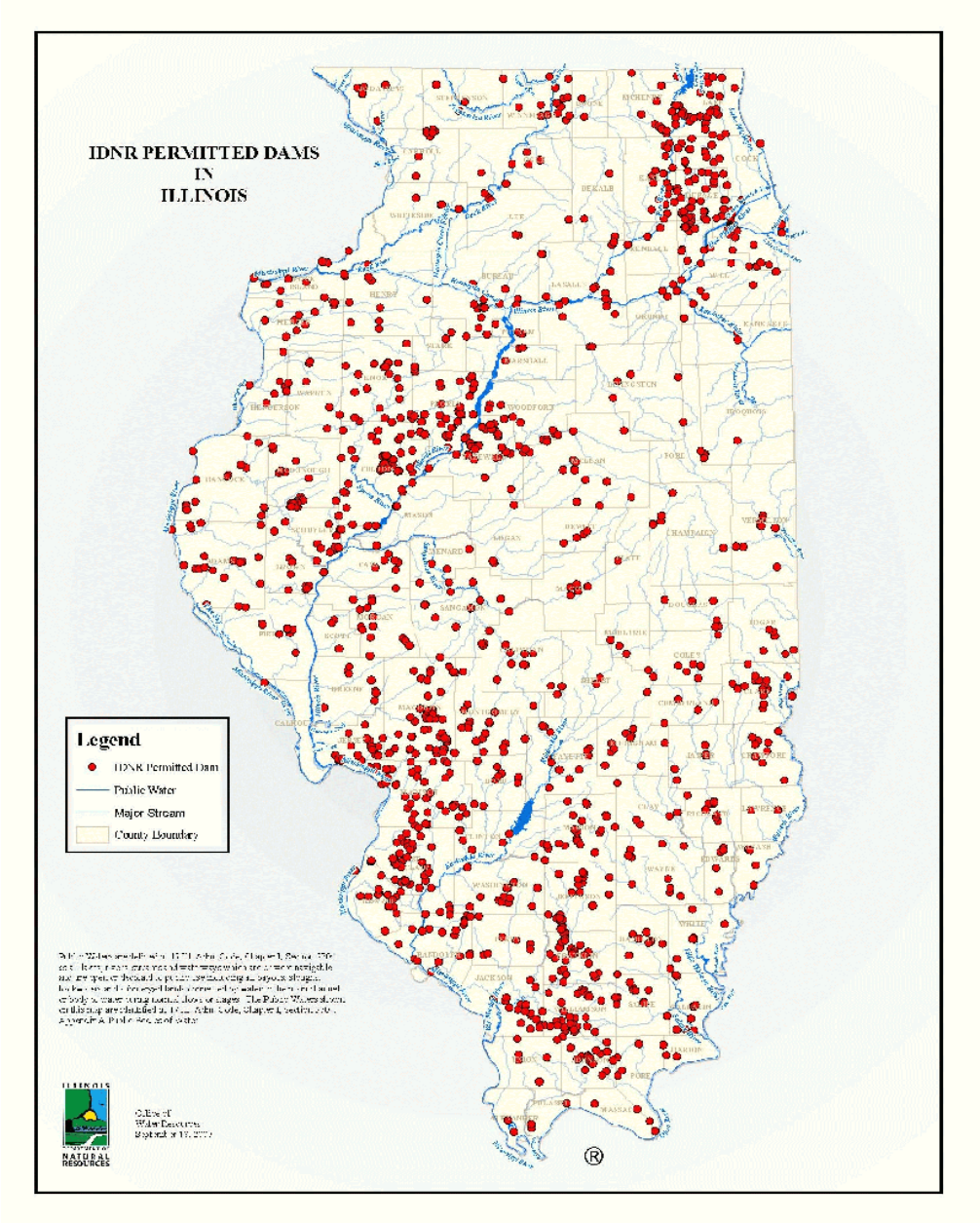

Dams by Hazard Potential
968
335
201
0
High
Significant
Low
Undetermined
Hazard Potential


Dams By Primary Type
1420
1
15
35
21
11
1
Arch
Concrete
Earth
Gravity
Other
Rockfill
Unknown
Primary Type

Sources

Federal Emergency Management Agency.1997. "Multi-Hazard Identification and Risk Assessment:: A Cornerstone of the National Mitigation Strategy." http://www.fema.gov/fhm/dl_mhira.shtm.

National Inventory of Dams, USACE http://geo.usace.army.mil/pgis/f?p=397:3:1577842890320650::NO::P3_STATES:IL



Sources

Federal Emergency Management Agency.1997. "Multi-Hazard Identification and Risk Assessment:: A Cornerstone of the National Mitigation Strategy." http://www.fema.gov/fhm/dl_mhira.shtm.

Mine Subsidence:

"Mine Subsidence" is a lateral or vertical ground movement caused by a failure initiated at the mine level, of man-made underground mines, including, but not limited to coal, clay, limestone, lead-zinc and fluorspar mines. In simpler terms, when the roof of a subsurface mine collapses, it causes the ground above to sink or subside. Most experts agree that room and pillar mines will eventually experience some degree of collapse, but currently there is no way to know when or exactly where mine subsidence will occur. *Illinois Mine Subsidence Insurance Fund 8/7/12* https://www.imsif.com/definition (the largest subsidence event in Illinois was over a lead-zinc mine and subsidence also happens where buildings are not located)

Nature of the Hazard

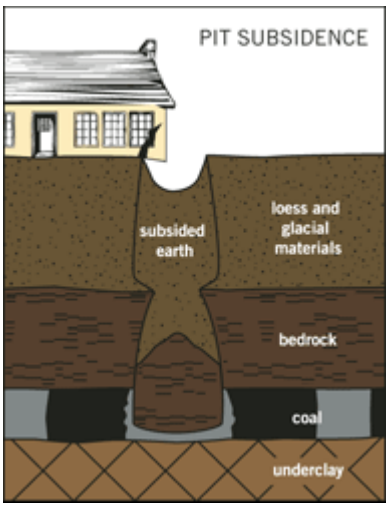
Generally speaking, Illinois has two forms of subsidence; pit and sag. According to the Illinois Department of Natural Resources Office of Mines and Minerals it is currently not possible to predict precisely how long a mine subsidence event will last. It is known, based on experience, that 60 to 90 percent of the total ground movement occurs within the first few weeks of an event. The remaining ground movement continues to develop at a continually decreasing rate and may take 3 to 5 years, or sometimes decades, to reach completion.

Illinois Mine Subsidence Insurance Fund Confirmed Claims Distributed by County

1999 - 2012

St. Clair	422
Sangamon	208
Madison	143
Christian	69
LaSalle	37
Saline	26
Macoupin	17
Tazewell	16
Perry	13
Williamson	13
Grundy	12
Franklin	11
Fulton	8
Vermilion	7
Clinton	6
Randolph	3
Bond	1
Jackson	1
Jefferson	1
Knox	1
Livingston	1
McDonough	1
Montgomery	1
Peoria	1
Rock Island	1
White	1
TOTAL	**1,021**

Pit subsidence:

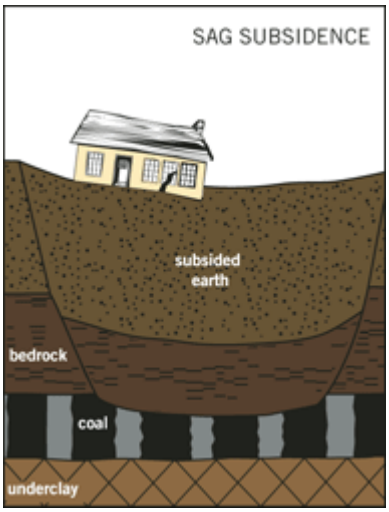


- bell-shaped hole,
- usually 6-8 feet deep and 2-40 feet across.
- The mine will most likely be shallow, less than 100 feet deep,
- The bedrock over the mine is usually less than 50 feet thick and consists of weak rock materials such as shale.
- Ground movement will be swift and sudden.

Diagrams Provided by the Illinois Mine Subsidence Insurance Fund

Sag subsidence:

- the most common type of mine subsidence,
- appears as a gentle depression in the ground and can spread over an area as large as several acres.
- First signs may appear suddenly within a few hours or days, with gradual movement continuing anywhere from a couple of years to more than a decade.
- Damage is usually subtle, and perhaps dismissed as normal wear and tear until multiple signs appear.
- Sag subsidence can develop over mines of any depth and are usually caused when coal pillars, left intact by miners to support the mine roof, disintegrate or collapse or are pushed into a soft layer below the pillars. *(ISGS, 13)*



Diagrams Provided by the Illinois Mine Subsidence Insurance Fund

History

While past generations were using mined coal as a fuel source, not much thought went into how this mining would impact future generations. The miners' goal was to get the coal and get out of the mine. Because there was no urbanization above the mines, they weren't concerned about the long term stability of the rooms. When the miners were done, they left. But the abandoned mines left behind were not necessarily stable. In fact, mines can fail in many different ways.(IMSIF, 13)

About 840,000 acres of Illinois land have been undermined for coal and other minerals. The Illinois State Geological Survey estimates that approximately 201,000 acres of urban and built up lands in Illinois are in close proximity to mines. Within that area, there are an estimated 330,000 housing units with possible exposure to mine subsidence. Statewide, this number is likely to increase as urban sprawl continues. The number of underground coal mines in Illinois has been estimated at 5,500. Maps exist for about 2,600.(ISGS, 06)

In 1979, the Mine Subsidence Insurance Act was passed to provide subsidence insurance for Homeowners in mining areas. The risk of damage was high enough that the law mandated that private insurance carriers include coverage as a part of their homeowner policies. Homeowners in counties where 1% or more of the land has been undermined (fig. 1 below) will automatically have subsidence insurance added to their policies when issued. Those individuals refusing coverage will be asked to sign a waiver. (ISGS, 06) Figure 2 below identifies land that has been mined in Illinois. Later Amendments to this Act have increased coverage for insured structures from $50,000 (1979) to $350,000 (1990). Mine subsidence insurance in Illinois covers damage caused by underground mining of any solid mineral resource. (ISGS, 13)

If there are life safety concerns associated with past mining activity, a property owner should contact the Illinois Department of Natural Resources, Office of Mines and Minerals, Abandoned Mined Lands Division. If desired by a property owner, a team can be promptly dispatched to investigate the concerns. If conditions prove to be (1) life threatening and (2) mine related, Abandoned Mined Lands staff will seek federal funds to abate the hazardous conditions. These funds appropriated by the U.S. Congress can be made available through the Office of Surface Mining Reclamation and Enforcement to be used in abating life-threatening conditions associated with abandoned coal mines. These funds cannot be used for damage repair but are readily available for life protection measures. Often the work associated with hazard abatement serves to reduce or control future damages. (ISGS, 06)

Provided by the Illinois Mine Subsidence Insurance Fund

Illinois Mine Subsidence Insurance Fund
Mine Subsidence Claim Payments
1999 – 2012

1999	$3,651,278
2000	$6,141,826
2001	$5,708,849
2002	$4,527,670
2003	$4,021,325
2004	$10,025,654
2005	$5,561,257
2006	$5,444,497
2007	$7,605,006
2008	$15,270,358
2009	$13,432,750
2010	$12,289,510
2011	$9,760,583
2012	$5,596,288
TOTAL	$109,036,849

Illinois Mine Subsidence Insurance Fund
Number of Confirmed Mine Subsidence Claims 1999 - 2012

1999	73
2000	77
2001	71
2002	70
2003	62
2004	44
2005	35
2006	64
2007	117
2008	88
2009	106
2010	98
2011	51
2012	65
TOTAL	1,021

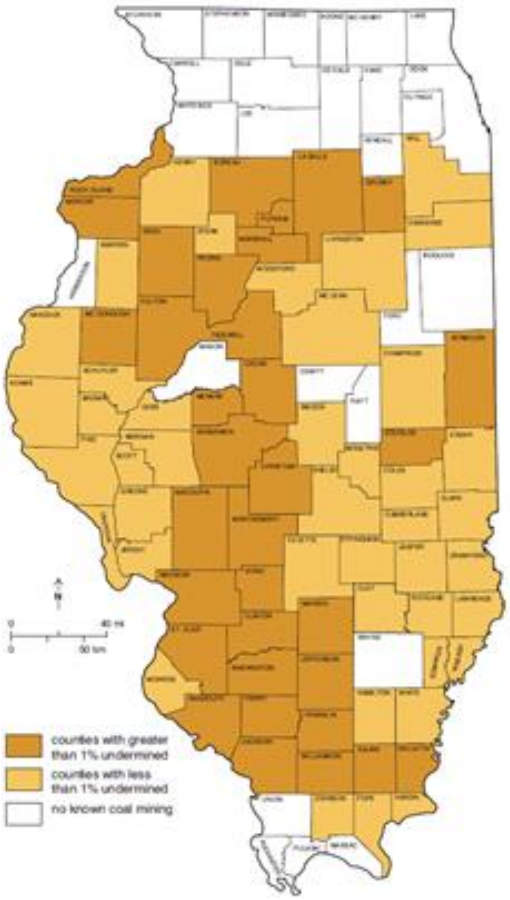


Figure 1

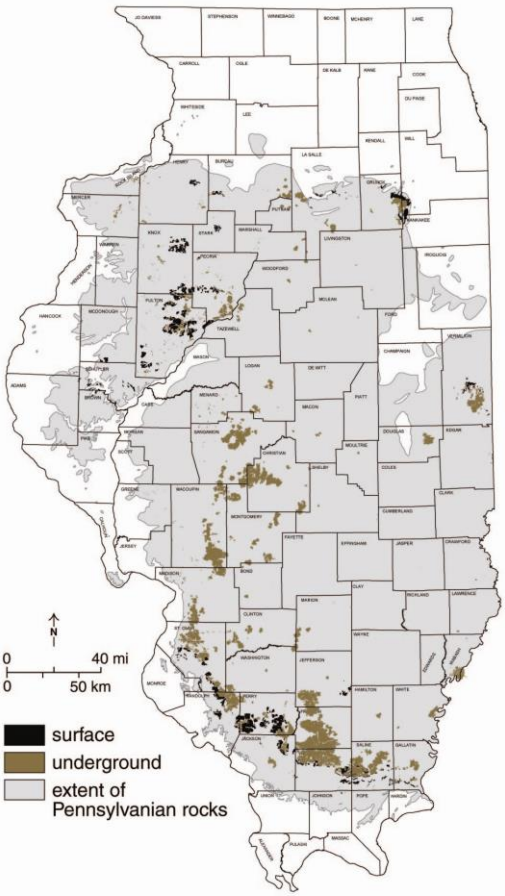


Figure 2

Sources: *Illinois Mine Subsidence Insurance Fund 7/31/13* https://www.imsif.com/

Illinois State Geological Survey, 2013 *"Mine Subsidence In Illinois: Facts for Homeowners" Circular 569* *http://www.isgs.illinois.edu/education/pdf-files/c569.pdf*

Influenza Pandemic

The 2013 INHMPC discussed the addition of a pandemic portion to the INHMP update. Whereas a pandemic is historically not addressed as a natural hazard, the INHMPC felt that this type of hazard should be included in the plan, in order to annually review the impact of a pandemic hazard in Illinois and begin to develop a stronger documentation for a hazard rating. According to the Center for Disease Control and Prevention and the Illinois Department of Public Health, the seasonal influenza or the "flu," a viral infection, results in approximately 36,000 deaths in the United States, including 2,000 in Illinois, and 200,000 hospitalizations annually. The genetic makeup of influenza virus has the potential to change over time resulting in a new strain to which people have never been exposed. This results in the potential to cause an outbreak of influenza. An influenza pandemic can occur when a non-human (novel) influenza virus gains the ability for efficient and sustained human-to-human transmission and then spreads globally. Pandemics are different from seasonal outbreaks or "epidemics" of influenza. Seasonal outbreaks are caused by subtypes of influenza viruses that are already in existence among people. Past influenza pandemics have led to high levels of illness, death, social disruption, and economic loss.

Influenza viruses that have the potential to cause a pandemic are referred to as 'influenza viruses with pandemic potential.' Examples of influenza viruses with pandemic potential include influenza A, H5N1 and influenza A, H7N9. These are two different types of avian (bird) influenza viruses. These non-human viruses are novel among humans and circulate in birds in parts of the world. So there is little to no immunity against these viruses among people. Human infections with these viruses have occurred rarely. If either virus changes in such a way to allow for efficient infections in humans and sustained person to person transmission of the virus, an influenza pandemic could result. Influenza pandemics are different from many of the threats for which public health and the health care system are currently planning:

- The pandemic will last much longer than most other emergency events and may include "waves" of influenza activity separated by months (in 20th century pandemics, a second wave of influenza activity occurred three to 12 months after the first wave).
- The numbers of health care workers and first responders available to work are expected to be reduced as many will be at high risk of illness through exposure in the community and in health care settings, and others may have to miss work to care for ill family members.
- Resources in many locations could be limited due to the impact of the widespread nature of influenza pandemic.

Many scientists believe it is only a matter of time until the next influenza pandemic occurs. The severity of the next pandemic cannot be predicted, but modeling studies suggest that its effect in the United States could be severe. In the absence of any control measures (vaccination or drugs), it has been estimated that in the United States a "medium–level" pandemic could cause 89,000 to 207,000 deaths, between 314,000 and 734,000 hospitalizations, 18 million to 42 million outpatient visits, and another 20 million to 47 million people being sick. Between 15 percent and 35 percent of the U.S. population could be affected by influenza pandemic, and the economic impact could range between $71.3 billion and $166.5 billion. See the table below on the projected impact of a pandemic influenza outbreak to Illinois:

Potential Pandemic Influenza Deaths and Hospitalizations in Illinois from a Pandemic Flu (Assuming a 15% -- 35% attack rate)*			
Projected Dead	Projected Hospitalized	Projected Outpatient	Projected Cases
4,000 to 9,000	12,000 to 38,000	750,000 to 2 million	2 million to 4.5 million

*Estimates are based on CDC national projections

The Illinois Department of Public Health has developed the Illinois Pandemic Influenza Preparedness and Response Plan in an effort to address this potential hazard in Illinois. It is a dynamic document that will be updated to reflect new developments in the understanding of the influenza virus, its spread, treatment and prevention. The plan also will incorporate changes in response roles and improvements in response capability development through ongoing planning efforts. The purpose of the *Illinois Pandemic Preparedness and Response Plan* is to provide a framework for State, local and federal public health and medical officials to work together to reduce morbidity, mortality, and social disruption that would result from a pandemic influenza outbreak. The purpose of the plan is to provide a framework for State, local and federal public health and medical officials to work together to reduce morbidity, mortality, and social disruption that would result from a pandemic influenza outbreak. The Concept of Operations provides guidance on conducting activities that aid in all entities being prepared to response to and mitigate a pandemic influenza outbreak. Guidance is broken down into what individual agencies should be doing prior to the outbreak- preparedness, how agencies should coordinate to mitigate the outbreak- response; and finally how individual agencies collaborate to help the public recover after the outbreak- recovery.

Landslide

A landslide is the force of rocks, soil and debris moving down a slope and debris flows (mudflows) are rock, earth and other debris saturated with water which changes into a flowing river of mud. Illinois does not have a state-wide reporting system for landslides. The Illinois State Geological Survey (ISGS) received some reports from individuals in the Illinois Department of Transportation, Universities and ISGS staff. The ISGS has performed a few systematic landslide inventories along rivers; part of the Illinois River by LaSalle/Peru (DuMontelle et al., 1971), and part of the Ohio and Mississippi Rivers in southern Illinois (Su and Stohr, 1992). An inventory based on submitted information was published in 1985 (Killey et al., 1985). This publication also included costs associated with some of the reported events. The 1985 publication had 25 landslides with cost information totaling to $8,271,000 with a range from $4,000 to $2,220,000 in repairs & damage for an individual landslide, reported in 1982 dollars. This old total would be just over $20,000,000 today with the range from $9,700 to $5,375,000 per landslide. Of all the landslide reports, only one death is known in Illinois to be associated with landslides. The ISGS maintains a database which is being updated using the original forms, archived site reports performed by ISGS staff and new events added through review of imagery. To date there are about 335 individual landslides reported in 49 counties. Nearly 60 percent are classified as related to human activity, most associated with cutting into slopes for roadways.

References

DuMontelle, P.B., N.C. Hester and R. E. Cole, 1971, Landslides Along the Illinois River Valley South and West of LaSalle and Peru, Illinois, Illinois State Geological Survey Environmental Geology Notes No. 48, 16 pp.

Killey, M.M., J.K. Hines and P.B. DuMontelle, 1985, Landslide Inventory of Illinois, Illinois State Geological Survey Circular 534, 28 pp.

Su, W. J. And C. J. Stohr, 1992, Landslides in the New Madrid Seismic Zone: Landslide Inventory and Risk Assessment in Illinois, Along the Ohio and the Mississippi Rivers from Olmsted to Chester, Illinois: Final Technical Report to the U.S. Geological Survey, 147 pp.

The following hazards have been previously discussed by the INHMP planning team as other possible hazards impacting Illinois. These hazards currently do not have the frequency of occurrences or impact that would constitute an in-depth analysis and coverage in the INHMP. However, these hazards will continue to be monitored by the INHMP planning team to ensure that if their occurrences and impact increases to a level that warrants further analysis, they will be analyzed in further detail in the INHMP.

Expansive soils are generally clay soil. As clay soil absorbs water it will expand or increase in volume and as the water leaves the soil it will shrink or lessen in volume. This may result in damage to foundations after decades of wetting and drying.

Karst is a sinkhole found in a specific type of limestone. Karst areas also contain underground streams and caverns. The appearance of sinkholes depends on how fast the carbonate landscape erodes. According to the U.S. Geological Survey, "Karst is a terrain with distinctive landforms and hydrology created from the dissolution of soluble rocks, principally limestone and dolomite. Karst terrain is characterized by springs, caves, sinkholes, and a unique hydrogeology that results in aquifers that are highly productive but extremely vulnerable to contamination. In the United States, about 40% of the groundwater used for drinking comes from karst aquifers." Illinois is located in Midwest Paleozoic Carbonate Aquifer Region, which includes the majority of the Midwest including: Iowa, Illinois, Indiana, Ohio, Wisconsin, Michigan and Tennessee.

Wildfire is a fire occurring in relatively untouched wild land areas or in wilderness areas. The Shawnee National Forest located in Southern Illinois primarily is primarily the main location in Illinois that could be impacted by a wildfire. Shawnee National Forest consists of approximately 280,000 acres of federally managed lands. The majority of the forest is located in parts of Pope, Jackson, Union, Hardin, Alexander, Saline, Gallatin, Johnson, and Massac counties.

Lake Michigan Storm Surge is an abnormal rise and onshore surge of lake water due to intense winds within a storm, or the surface barometric pressure drop near the storm center. The effects of a strong storm surge will be high winds and waves, lakeshore flooding, beach erosion and damage to unprotected vessels and structures in the lake or near the lakeshore. This definition was provided by Mr. Chris Miller, WCM, National Weather Service, Lincoln, Il. Storm surge and seiche were discussed at length during a planning meeting. As a result of the discussion, Mr. Miller spoke to Mr. Jim Allsopp, the WCM of the Chicago NWS office to determine how extensive a problem this was in Illinois. Jim Allsopp said that with storm surges, the biggest problem has been

beach erosion. However, these are not very frequent occurrences, and it has been awhile (more than 10 years) since this has been a problem.

Jim Allsopp also said that about once per year, Chicago experiences a seiche. This occurs when a line of severe thunderstorms with strong winds moves from NW to SE across the southern part of Lake Michigan. Because of the shape of the lake, the results are high waves which cause the lake level to rise rapidly. He said that they get a minor seiche about once per year where the water levels rise about 2 to 3 feet along the piers on Lake Michigan. In 1954, a 10 foot seiche wave caused eight deaths in Chicago and lakeshore damage along the Illinois Lake Michigan shoreline (Ewing, et al., 1954).

Lake County approved DMA2K plan looked at coastal erosion for their County. Currently, it is estimated that 4% of the County/communities (Highland Park, Highwood, Lake Bluff, Lake Forest and North Chicago) in Lake County has the potential to be affected. Because the structures (roads, homes and associated structures) have been constructed with a significant setback from the area vulnerable to failure, no significant damage is expected from this natural hazard. By their five-year update, the County plans to evaluate the area and structures in more detail. IEMA will continue to monitor the information provided by professional staff, the Lake County plan update and information received from the other State potential coastal erosion area in Cook County.

J. Local Risk Assessment

As each jurisdiction begins the planning process they will be provided three risk assessment forms/with instructions to be completed and returned when the plan is submitted for approval.

1) **Worksheet #3a** is from the "State and Local Mitigation Planning how-to guide", FEMA 386-2. When this document is received from a local jurisdiction and after the local mitigation plan has received FEMA approval, it will be compiled in an Illinois Natural Hazard Mitigation Plan supporting documentation notebook.

2) **Potential Structure Losses for Floods** is a form which was prepared to capture local jurisdiction information. If flooding is a hazard, the information from this form will be entered in the Illinois Natural Hazard Mitigation Plan when the local jurisdiction receives FEMA approval. Refer to the next page for a copy of this form.

3) **Potential Structure Losses for Earthquakes**, is a form which was prepared to capture local jurisdiction information. If earthquakes are a hazard, the information from this form will be entered in the Illinois Natural Hazard Mitigation Plan when the local jurisdiction receives FEMA approval. Refer to the next page immediately after the potential structure losses for floods form.

This section will be expanded to capture local information on structures as local jurisdiction plans receive FEMA approval.

POTENTIAL STRUCTURE LOSSES FOR FLOODS

City County or Multi-Jurisdictional	County	Assessed Vulnerability	Estimated # of People	% of Structures in Floodplain	# Estimated Residential Losses	$ Estimated Residential Losses	# Estimated Commercial Losses	$ Estimated Commercial Losses	# Estimated Industrial Losses	$ Estimated Industrial Losses	# of Critical Facilities	Relative Losses

POTENTIAL STRUCTURE LOSSES FOR EARTHQUAKES

City County or Multi-Jurisdictional	County	Assessed Vulnerability	Estimated # of People	# Estimated Residential Losses	$ Estimated Residential Losses	# Estimated Commercial Losses	$ Estimated Commercial Losses	# Estimated Industrial Losses	$ Estimated Industrial Losses	# of Critical Facilities (CF)	$ Estimated Loss to Critical Facilities (CF)	Type of CF Structure	Relative Losses

K. State Owned or Operated State Facility Data Methodology

The 2004 INHMP established an initial list of State owned or operated facilities. This data was obtained from the Department of Central Management Services (CMS) in order to comply with the requirement, regarding State owned or operated facilities, established in Title 44 Code of Federal Regulations part 201.4(c)(2)(ii). At that time, the SHMO thought that additional information would be available from CMS, specifically latitude/longitude of state facilities to enhance this section. In 2004 CMS contracted with Illinois Property Asset Management (IPAM), to compile an all-encompassing list of state owned and operated facilities. At the time in 2004, IPAM supplied a preliminary list, in electronic format. The list provided by IPAM contained 7,345 buildings. Of the buildings on that list, approximately 300 are listed as "Demolished", leaving 7,095 buildings in the inventory. The inventory ranges from a privy at a state park to the State Capitol building and everything in between. This list was utilized to develop the loss estimates identified in the 2004 plan update. The process regarding the calculation of loss estimates is described later in this section.

IEMA contacted CMS regarding updated information for state owned or operated facilities for the 2013 plan. CMS advised that the information provided by IPAM was never finalized, resulting in a non-updateable data set that provided duplicated coordinates for buildings on multi-facility campuses and lacked square footage for many of the facilities. CMS indicated that they maintain about 829 state and regional office buildings throughout the state. Of these 829 facilities only 254 are State owned, while the remaining 575 are leased facilities. A list of CMS maintained state facilities was provided for the 2013 update. Building information for all other State and Constitutional Agencies is maintained and updated by each prospective individual agency. These agencies include: Secretary of State, Department of

Agriculture, Department of Veterans Affairs, Department of Military Affairs, Department of Human Services, State University System, Attorney General, Treasure's Office, Comptroller's Office, Department of Transportation, Department of Corrections, Toll Highway, Department of Natural Resources and Student Assistance Commission.

It was ultimately determined that the methodology and data used in 2004, utilizing the IPAM data, was the best information available for the 2013 update and showed the most accurate loss estimate for all State facilities. This determination was made due to the fact that the building and cost information utilized in 2004 to produce these results, incorporated all state owned and operated facilities, including non-CMS managed facilities, and that this data has not been updated in a singular dataset that would constitute any more accurate numbers then were obtained in 2004. Until the new information can be obtained regarding a comprehensive State facility database, the old calculations have been retained, and utilized in the 2013 assessment.

Neither the Illinois Emergency Management Agency nor the INHMPC have the statutory authority or the resources to develop or maintain such a detailed database; however they do concur that such a database would be a strong asset to all phases for emergency management. This type of all-encompassing dataset could create a shared resource for all levels of government. The property data managed through CMS, joined with the data collected and maintained from cooperating state agencies could create a basis for significant future analysis impacting functions such as:

- Preparedness
- Response
- Recovery
- Mitigation
- Economic Development
- Homeland Security and Public Safety
- Land Management
- Planning Efforts

In an attempt, to achieve the creation of an all-encompassing database, the IHHMPC unanimously created a mitigation action item addressing this issue. The 2013 INHMP has incorporated an action item (Action 1.3.1.7) that will coordinate with State agencies to develop an all-encompassing database of state controlled buildings and facilities, which may include latitude/longitude, square footage and estimated facility cost. Preliminary steps, including funding exploration, have already begun in an effort to make this database available for future updates.

FEMA has indicated that in order to remain compliant with the requirement regarding State owned or operated facilities established in Title 44 Code of Federal Regulations part 201.4(c)(2)(ii), the 2013 INHMP would be required to include a detailed description for the development of an updated all-encompassing list of state owned and operated facilities for use in future plans. The outline below details the anticipated steps to obtain greater state facility information for future plans. It should be noted that IEMA does not have the statutory authority to regulate any of the State agencies to provide the requested information. The development and maintenance of this anticipated database is dependent on a number an uncontrollable variables including the voluntary participation by all State entities. Initial development would include state facilities with the greatest life safety and financial impact on the state; including facilities with a total cost over $8 million dollars and those with occupancy of 150 or more.

- Meet with State Agencies and obtain buy-in for the development of database, by discussing potential benefits of a singular database. Initial steps have begun during the 2013 INHMP update; all agency representatives support the development of said database.

- Work with the IEMA Director's Office, to engage agency head level involvement with state agency entities to solicit participation in gathering facility information.

- Explore possible funding avenues for capturing the required information and compilation of data into a singular dataset.

- CMS will remain the main point of contact for State facility information. As defined in the Illinois Blue Book, published by the Illinois Secretary of State, "The mission of Central Management Services (CMS) is to free Illinois state agencies and governmental entities to focus their resources on their core missions." CMS is a member of the planning committee and has been working with the planning committee to provide the latest available information. This is a team effort: CMS has been sharing the facility data and IEMA and the planning committee members have been sharing mitigation ideas with CMS. We view this as an ongoing process.

- Expand CMS's current state facility database to include new categories for coordinates and building replacement cost, while maintaining and updating the existing dataset of all CMS managed facilities.

- Engage facility building managers to capture coordinates and square footage of CMS managed facilities.

- Explore CMS capturing building information supplied by non-CMS facilities managers, in a singular database. CMS has advised that agencies not under the Governor's Office, submit facility information annually for the "General Annual Real Property Report" which is supplied to the Illinois General Assembly. CMS currently does not vet, maintain, track nor update these submissions.

- Engage agencies with facilities currently not under CMS control, to capture building specific information including coordinates, square footage and replacement costs. Include these representatives from said agencies into the INHMPC planning process, to ensure a throughout understanding of the process. These agencies include: Secretary of State, Department of Agriculture, Department of Veterans Affairs, Department of Military Affairs, Department of Human Services, State University System, Attorney General, Treasure's Office, Comptroller's Office, Department of Transportation, Department of Corrections, Toll Highway, Department of Natural Resources and Student Assistance Commission.

- Explore the possibility of the development of a committee comprised of state agency GIS specialist to development and maintain agency specific base maps for individual agency controlled facilities. These layers could then be added into an all-encompassing state map, showing all state owned and operated facilities as agency specific layers.

The following narrative describes how the data for the State of Illinois owned or operated facilities was collected and the methodology used for analysis of the data, in the 2004 Illinois Natural Hazard Mitigation Plan and subsequently utilized in the 2013 update. In order to comply with the requirement, regarding State owned or operated facilities, established in Title 44 Code of Federal Regulations part 201.4(c)(2)(ii), the Illinois Emergency Management Agency (IEMA) set about the process of collecting the data necessary to be included in the INHMP04.

On December 5, 2003, representatives of IEMA and the Federal Emergency Management Agency (FEMA) came together via a teleconference to establish the minimum allowable state owned critical or operated facilities data which must be included. Out of that meeting came a consensus on which facilities should be included in the INHMP04. The following list is those minimum critical facilities:

Illinois State Police (ISP) facilities
Illinois Department of Transportation (IDOT) facilities
State of Illinois owned hospitals
State of Illinois owned mental health and developmental disability facilities
Infrastructure map (showing highways, bridges and waterways)
Lifelines Map (showing power, gas/oil pipelines and communications)
Public recreation areas map

Transportation systems map (showing airports, ports and other transportation terminals)

With a framework of what critical facilities should be addressed in the INHMP04, IEMA set about the process of collecting the data necessary to include the facilities in the plan. Representatives of IEMA established contact with Mr. Prentis Johnson of the State of Illinois Department Central Management Services (CMS), Bureau of Property Management (CMS-BPM). Mr. Johnson was the CMS-BPM liaison to the Illinois Natural Hazard Mitigation Planning Committee (INHMPC). CMS is the central clearinghouse for information pertaining to State of Illinois facilities. According to the State of Illinois Blue Book 2003-2004 "The mission of Central Management Services (CMS) is to free Illinois state agencies and governmental entities to focus their resources on their core missions" (page 218). The CMS Bureau of Property Management "is responsible for managing the state's real, personal and surplus property . . . The bureau maintains about 30 state and regional office buildings throughout the state . . . by the end of fiscal year 2004, CMS will be responsible for managing 655 state-owned facilities with 7,074 individual buildings" (pages 219-220).

Mr. Johnson informed IEMA that CMS was working with a sub-contractor, Illinois Property Asset Management (IPAM), to compile a list of state owned and operated facilities. Mr. Johnson arranged for representatives of IEMA to meet with Mr. Robin M. Ellerthorpe of IPAM. At that meeting, Mr. Ellerthorpe provided IEMA with a list, in electronic format, of some 7,345 buildings in the purview of CMS. IEMA again contacted CMS for updated information for the 2013 plan, but the data from 2004 was still the most comprehensive data available. Unfortunately, the state facility list developed by IPAM was not complete and subsequently wasn't updated through the previous years. The information provided in the IPAM listing is not all-encompassing and indicates duplicate latitude and longitude for buildings on a singular campus. A detailed description regarding correcting this issue has been outline previously in this section. The following information describes how the facility data was utilized to determine loss estimates.

Utilizing the data supplied by Central Management Services

As mentioned above, the list provided by IPAM contains 7,345 buildings. Of the buildings on that list, approximately 300 are listed as "Demolished". This leaves 7,095 buildings in our inventory. The inventory ranges from a privy at a state park to the State Capitol building and everything in between.

The first step towards effective utilization of the data was to assign a "State Facility Type" code. All facilities in the State of Illinois were divided into nine separate categories. Each of the nine facility types was assigned an identifier, which was a numeral one through nine. Each of the facility type categories and their identifiers are as follows:

Facility Type	Description	Identifier
Administrative	offices, maintenance facilities, warehouses/storage facilities, print shops	1
Correctional	prisons, correctional facilities, juvenile detention facilities	2
Education	primary/secondary schools, colleges, universities and trade schools, libraries, museums, historic sites	3

Emergency	law enforcement facilities, emergency management facilities, national guard facilities, ranger stations, rescue stations, fire stations	4
Health	hospitals, clinics, mental health facilities, nursing homes, assisted living facilities, developmental disability facilities	5
Recreation	parks, conservation areas, fairgrounds	6
Utilities	power plants, electrical and gas distribution facilities, communications facilities, dams, locks	7
Transportation	highway maintenance facilities, toll way facilities, special transportation structures	8
Other	facilities not fitting under the above categories	9

Each building in the inventory was evaluated according to the criteria established above, and assigned a numerical identifier according to their facility type. The next step was to assign a building replacement cost based on the total square footage of the building. The price per square foot was derived from the table on page 3-10 of the FEMA publication "State and Local Mitigation Planning how-to guide: Understanding Your Risks". Once all 7,095 buildings were assigned an identifier and a building replacement cost the inventory then was sorted according to county. From there we were able to identify how many of each of the facility types are represented in each county and the total replacement for each county.

A total of 7,095 were evaluated for loss estimations in the 2004 plan. The 2013 update focused on 230 critical/essential State owned/operated facilities that were obtained from the Central Management Services database, Illinois HSIP Freedom 2012 and various other State agency databases. The loss of any State facility will have an effect on the State's operations. However, it was determined that the loss or disruption of services from these identified 230 facilities would have the largest impact on the operation of State essential services as a whole. The loss estimate for State owned/operated facilities in each county is represented in the table on the next three pages. Table III-1 provides an approximate estimate of the potential loss of State owned/operated facilities with in Illinois and their prospective counties.

Average Building Replacement Value per Square Foot

Occupancy Class	Total $/sq. ft.	Occupancy Class	Total $/sq. ft.
Single Family Dwelling	77	Theaters	98
Mobile Home	52	Parking	30
Multi-family Dwelling	98	Heavy Industrial	69
Temporary Lodging	102	Light Industrial	69
Institutional Dormitory	98	Food/Drugs/Chemicals	69
Nursing Home	89	Metals/Minerals Processing	69
Retail Trade	67	High Technology	69
Wholesale Trade	53	Construction	69
Personal/Repair Services	92	Agriculture	26
Professional/Tech. Services	87	Church/Non-Profit Offices	113
Banks	151	General Services	88
Hospital	145	Emergency Response	130
Medical Office/Clinic	112	Schools	91
Entertainment & Recreation	131	Colleges/Universities	115

Source: State and Local Mitigation Planning how-to-guide: Understanding Your Risks-HAZUS

Contents Value as Percentage of Building Replacement Value

Occupancy Class	Contents Value (%)
Residential (including temporary lodging, dormitory, and nursing homes)	50
Commercial (including retail, wholesale, professional, services, financial, entertainment & recreation)	100
Commercial (including hospital and medical office/clinic)	150
Commercial Parking	50
Industrial (including heavy, light, technology)	150
Industrial Construction	100
Agriculture	100
Religion/Non-Profit	100
Government Emergency Response	150
Government General Services	100
Education Schools/Libraries	100
Education Colleges/Universities	150

Source: State and Local Mitigation Planning how-to-guide: Understanding Your Risks-HAZUS

State of Illinois Facilities By County

Table III-1

State Facility Types

County Name	Administrative	Correctional	Education	Emergency	Health	Recreation	Utilities	Transportation	Other	Tot Buildings	Replacement Cost
Adams	1	2	0	6	50	7	1	6	0	73	$70,276,982
Alexander	4	16	0	1	0	13	1	7	0	42	$41,708,543
Bond	0	0	0	0	0	0	0	4	0	4	$1,711,864
Boone	0	0	0	0	0	0	0	2	0	2	$1,097,272
Brown	0	28	0	0	0	0	0	2	0	30	$39,411,626
Bureau	1	0	0	0	0	12	1	13	0	27	$6,015,552
Calhoun	0	0	0	0	0	0	0	3	0	3	$847,528
Carroll	2	18	0	0	0	52	2	4	0	78	$62,574,608
Cass	2	0	0	2	0	46	0	5	0	55	$6,626,375
Champaign	24	0	0	9	2	0	3	9	0	47	$70,533,264
Christian	1	26	0	0	0	0	1	3	0	31	$20,100,629
Clark	1	0	0	0	0	25	0	7	0	33	$3,056,420
Clay	0	0	0	0	0	0	0	4	0	4	$2,769,888
Clinton	3	43	0	0	0	65	3	5	0	119	$37,087,900
Coles	2	0	28	5	0	75	2	7	0	119	$17,278,549
Cook	19	0	6	13	220	21	17	83	5	384	$682,854,165
Crawford	1	25	0	0	0	6	1	6	0	39	$20,247,829
Cumberland	0	0	0	0	0	0	0	5	0	5	$1,967,328
De Witt	1	0	0	0	0	48	2	5	0	56	$4,005,779
DeKalb	1	0	0	1	0	25	0	5	0	32	$7,070,492
Douglas	0	0	0	0	0	0	0	7	0	7	$2,246,464
DuPage	1	13	1	0	0	3	0	23	0	41	$20,383,688
Edgar	1	5	0	4	0	0	0	6	0	16	$21,044,099
Edwards	0	0	0	0	0	0	0	4	0	4	$870,856

County Name	Administrative	Correctional	Education	Emergency	Health	Recreation	Utilities	Transportation	Other	Tot Buildings	Replacement Cost
Effingham	2	0	0	5	0	0	3	21	0	31	$20,499,421
Fayette	3	111	2	1	0	5	6	7	0	135	$50,462,914
Ford	0	0	0	0	0	0	0	4	0	4	$1,553,904
Franklin	3	0	1	2	0	50	0	10	0	66	$13,779,144
Fulton	2	29	8	0	0	31	4	4	0	78	$60,019,080
Gallatin	1	0	8	0	0	5	0	6	0	20	$5,305,316
Greene	1	3	0	0	0	0	0	6	0	10	$5,105,755
Grundy	2	0	1	0	0	23	0	7	0	33	$5,735,521
Hamilton	3	0	0	0	0	46	0	0	0	49	$2,339,592
Hancock	2	0	1	0	0	33	0	4	0	40	$2,743,295
Hardin	1	9	0	0	0	14	0	0	0	24	$4,472,688
Henderson	0	0	0	0	0	2	0	4	0	6	$1,340,328
Henry	7	9	11	5	0	50	4	24	0	110	$44,562,923
Iroquois	1	0	0	0	0	11	1	13	0	26	$6,468,044
Jackson	5	5	0	5	0	111	1	15	0	142	$35,374,415
Jasper	1	0	0	0	0	48	0	5	0	54	$3,559,012
Jefferson	3	21	0	2	0	26	2	6	0	60	$49,135,636
Jersey	1	11	0	1	0	210	4	6	0	233	$23,992,135
Jo Daviess	2	0	15	0	0	29	3	7	0	56	$5,953,966
Johnson	1	3	87	0	0	0	49	5	9	154	$99,174,708
Kane	4	96	9	4	39	0	8	10	1	171	$282,549,884
Kankakee	0	10	1	2	73	29	16	6	1	138	$146,589,344
Kendall	3	0	0	0	0	24	0	5	0	32	$5,038,458
Knox	2	27	4	5	0	2	0	7	0	47	$53,001,357
La Salle	7	56	2	46	3	118	17	15	0	264	$110,072,191
Lake	2	0	2	2	67	112	5	13	0	203	$55,786,319
Lawrence	0	24	0	1		24	2	6	0	57	$49,839,720

County Name	Administrative	Correctional	Education	Emergency	Health	Recreation	Utilities	Transportation	Other	Tot Buildings	Replacement Cost
Lee	22	58	1	1	29	23	9	18	1	162	$116,572,214
Livingston	2	117	0	6	8	0	5	19	0	157	$135,441,619
Logan	4	86	1	1	26	8	2	5	1	134	$141,184,080
Macon	0	22	0	6	0	17	1	9	0	55	$42,846,945
Macoupin	0	0	0	0	0	19	1	4	0	24	$1,951,468
Madison	1	0	6	1	23	16	5	40	1	93	$62,640,638
Marion	2	0	1	1	14	46	3	7	0	74	$45,465,533
Marshall	0	0	0	0	0	11	0	3	0	14	$1,989,088
Mason	6	0	0	0	0	31	13	3	0	53	$11,486,249
Massac	4	0	1	0	0	70	0	5	0	80	$6,605,575
McDonough	1	0	0	4	0	7	1	3	0	16	$3,460,223
McHenry	3	0	0	1	0	34	5	10	0	53	$10,052,879
McLean	0	0	6	5	0	52	1	20	0	84	$20,286,605
Menard	0	0	90	0	0	0	1	2	0	93	$9,782,650
Mercer	1	0	0	0	0	3	0	5	0	9	$1,647,624
Monroe	0	0	0	0	0	0	0	6	0	6	$1,766,556
Montgomery	2	47	0	4	0	13	4	8	0	78	$41,888,718
Morgan	1	29	0	0	47	0	4	5	1	87	$130,148,636
Moultrie	10	0	0	1	0	7	0	4	0	22	$7,380,526
Ogle	1	0	0	0	0	87	1	11	0	100	$7,925,291
Peoria	5	33	8	3	10	123	4	15	0	201	$77,784,796
Perry	0	28	0	3	0	88	1	4	0	124	$88,467,146
Piatt	0	0	2	0	0	0	0	4	0	6	$1,809,544
Pike	1	6	0	4	0	2	0	7	0	20	$10,910,702
Pope	0	0	0	0	0	0	0	0	0	0	$0
Pulaski	0	0	0	2	0	0	2	0	0	4	$1,277,770
Putnam	0	0	0	0	0	0	0	0	0	0	$0

County Name	Administrative	Correctional	Education	Emergency	Health	Recreation	Utilities	Transportation	Other	Tot Buildings	Replacement Cost
Randolph	3	116	44	1	26	64	2	10	0	266	$129,939,204
Richland	0	0	0	0	0	0	0	4	0	4	$767,360
Rock Island	0	28	12	6	0	0	2	11	0	59	$56,247,010
Saline	0	16	0	0	0	0	0	4	0	20	$19,446,971
Sangamon	30	0	21	68	8	203	4	52	17	403	$659,217,219
Schuyler	0	10	0	0	0	0	0	2	0	12	$19,514,162
Scott	0	0	0	0	0	0	0	4	0	4	$1,313,664
Shelby	0	0	1	0	0	89	2	3	0	95	$5,137,888
St. Clair	1	15	4	5	0	23	0	21	0	69	$38,313,424
Stark	1	0	0	0	0	7	0	7	0	15	$2,573,412
Stephenson	1	0	0	1	0	24	2	5	0	33	$5,608,032
Tazewell	3	0	0	1	0	8	0	14	0	26	$14,214,058
Union	3	0	0	0	43	48	2	13	1	110	$85,379,444
Vermilion	1	31	0	2	0	84	2	9	0	129	$54,744,420
Wabash	0	0	0	0	0	11	0	0	0	11	$614,332
Warren	1	0	0	2	0	0	0	4	0	7	$9,163,468
Washington	1	0	0	0	0	36	0	5	0	42	$2,480,720
Wayne	1	0	0	0	0	18	0	4	0	23	$2,483,368
White	1	18	0	6	0	0	0	6	0	31	$64,621,318
Whiteside	2	0	3	13	0	48	2	11	0	79	$16,933,105
Will	7	166	0	8	4	49	17	19	0	270	$261,428,778
Williamson	1	0	0	3	0	0	0	9	0	13	$11,334,976
Winnebago	4	0	0	6	12	6	2	5	0	35	$47,357,973
Woodford	0	0	2	4	0	12	0	7	0	25	$4,525,686
Totals	251	1,416	390	291	704	2,788	259	887	38	7,024	$4,780,375,837

The following table was created utilizing Illinois Public Assistance records for State Agencies. Although the table does not identify specific building loss or vulnerability, it does identify impact associated with specific state agencies. The costs were tabulated utilizing only public assistance cost accrued in category C, E, and G in order to show a true reflection of building and infrastructure losses to State agencies and eliminate any cost accrued from Debris Removal or Emergency Protection Measures.

Category C: Roads and Bridges
Repair of roads, bridges, and associated features, such as shoulders, ditches, culverts, lighting, and signs.
Category E: Buildings and Equipment
Repair or replacement of buildings, including their contents and systems; heavy equipment; and vehicles.
Category G: Parks, Recreational Facilities, and Other Facilities
Repair and restoration of parks, playgrounds, pools, cemeteries, mass transit facilities, and beaches.

State Agency	Category of Work	Total Cost	Federal Share
FEMA-1633			
Illinois Emergency Management Agency	E	$6,885.00	$5,163.75
Illinois Department of Transportation	E	$7,452.50	$5,589.38
Illinois State Police	E	$6,549.78	$4,912.34
Illinois Department of Central Management	E	$7,310.00	$5,482.50
FEMA-1681			
Illinois Emergency Management Agency	E	$1,420.26	$1,065.20
FEMA-1729			
Illinois Department of Natural Resources	G	$276,309.16	$207,231.88
FEMA-1771			
Illinois Department of Natural Resources	C, E & G	$671,972.59	$503,978.00
Illinois Department of Transportation	C	$33,180.75	$24,885.56
Illinois Emergency Management Agency	E	$21,178.47	$15,877.11
FEMA-1800			
Illinois Department of Natural Resources	E & G	$175,910.12	$131,932.62
Illinois Commerce Commission	E	$37,519.78	$28,139.83
FEMA-1826			
Illinois Department of Natural Resources	E & G	$157,105.40	$117,829.05
University of Illinois	G	$16,514.22	$10,129.99
FEMA-1850			
Illinois Department of Natural Resources	C,E & G	$63,084.50	$47,313.38
Illinois Department of Transportation	C,E & G	$26,993.21	$20,244.91
Southern Illinois University	C,E & G	$2,574,894.39	$1,931,170.89
FEMA-1991			
Illinois Department of Natural Resources	C & G	$503,051.60	$377,288.73
Illinois Department of Corrections	C	$8,366.00	$6,274.50
Totals:	C,E & G	$4,595,697.73	$3,444,509.62

L. Vulnerability of State Facilities

State owned and operated facilities are important centers that link the government of the State of Illinois to the public it serves. These facilities can range from the Illinois State Capitol building in Springfield to one of the many Secretary of State's Driver Services Facilities throughout the State. These facilities are hubs for everything from administrative activities to public safety functions and every conceivable role in between. Should these facilities be rendered inoperable by a natural hazard, the public will lose a vital link between them and their government and the services the government provides. The following set of hazard maps for Illinois 102 counties show the nature, extent, scope and magnitude of identified hazard areas, as well as the locations of state owned or occupied facilities. A more in-depth analysis of the State's critical and essential facilities was utilized in the HAZUS analysis for flooding. This analysis included 230 State operated facilities and over 14,250 local critical or essential facilities. Due to Illinois' effective use of mutual aid, a number of the State's critical facilities are not state owned or operated. However, these facilities are just as vital to the State's operation as a state owned facility. Due to this reasoning, these locally and privately owned essential facilities were incorporated into the flood HAZUS analysis. It is anticipate that these initial facilities will be the foundation of building an all-encompassing database with latitude/longitude and building cost to create a more accurate loss estimate in future updates. The facilities found in this analysis remained consistent with the types of facilities agreed upon between FEMA and IEMA in the 2004 plan.

All state owned/operated facilities are potentially vulnerable to damage and impacts caused by the hazards found below. These hazards have the potential to affect facilities statewide. Although, the effect of these hazards on the facilities may not be location specific, their location does have an impact on the frequency that these facilities may be exposed to these hazards.

Severe Storms and Tornadoes: Storms and tornadoes can damage or destroy state facilities in a jurisdiction, thus cutting off vital State government services to the citizens in that area. State facilities would have comparable vulnerability to severe storms and tornadoes as all facilities located within a said county. As indicated in the Hazard Worksheet Methodology, "At any one time, it has been determined that over 25% of the county population might experience severe storms.

Floods: Floods can inundate the facility rendering it inoperable. A Hazus-MH UDF flood-loss analysis was performed on State owned essential and critical facilities identified within the 100-year floodplain. This analysis included 230 State operated facilities and over 14,250 local critical or essential facilities. Due to Illinois' effective use of mutual aid, a number of the State's critical facilities are not state owned or operated. However, these facilities are just as vital to the State's operation as a state owned facility. Due to this reasoning, these locally and privately owned essential facilities were incorporated into the flood HAZUS analysis. Using IEMA's statewide essential and critical facility database, five state-owned essential or critical facilities were identified within FEMA-mapped 100-year floodplains. A Hazus-MH user defined flood loss analysis was performed on each of these facilities to assess the flood exposure and potential flood losses if each of these facilities were to experience a 100-year flood. According to Hazus-MH, the estimated flood exposure for these five facilities (total estimated replacement value of structure and content) is $44.75 million. The total estimated flood loss if these structures were inundated to the 100-year flood level is $24.26 million. The exposure and losses estimates for each of these five facilities in listed below.

In addition, the Hazus-MH study showed four hundred non-state owned essential or critical facilities that were identified on 100-year floodplains. Of these 400 facilities, 8 were medical care facilities (hospitals, nursing homes and clinics), 48 were fire stations, 26 were police stations, 95 were schools, 25 were communication facilities, 10 were power facilities, 3 were natural gas facilities, 6 were oil facilities, 33 were potable water treatment facilities and 146 were waste water facilities. These 400 essential or critical facilities were located in 78 of the 102 Illinois counties. The top five counties with the greatest number of at risk essential or critical facilities were Madison County (31 facilities), Cook (30), La Salle (18), Will (17), and Jackson County (15). Appendix F lists all the essential and critical facilities on Illinois 100-year floodplains.

A UDF flood-loss analysis is a structure-by-structure analysis in which flood losses are calculated for specific building or buildings using depth-damage functions within Hazus-MH. UDF analysis requires certain building parameters which were not available from the IEMA essential and critical facility database. This missing data was replaced with default values, based on occupancy type, from FEMA's Hazus-MH Flood Model Technical Manual (FEMA, 2012). The missing parameters included square footage, building material, foundation type, and number of stories (see Table 2 for values used). As with the county-level-flood-loss modeling, a flood-depth grid was constructed using Hazus-MH's EQL tool employing either a DFIRM or digitized FIRM map for the floodplain boundary and a 1/3-arc-second DEM (10 m) for floodplain topography.

The following list of building parameters were used in the UDF flood-loss analysis for State-owned essential and critical facilities.

Facility Type	Occupancy Class	Average Square Footage (ft^2)	Estimated Replacement Cost ($Millions)	Building Material	Foundation Type	Number of Stories
Armory	IND2	30,000	$2.27	Masonry	Concrete Slab	1
Correctional Center	RES3F	60,000	$7.92	Masonry	Concrete Slab	1
Government Building	GOV1	11,000	$1.18	Wood	Concrete Slab	1
Regional Headquarters	COM4	80,000	$10.67	Masonry	Concrete Slab	1
Barracks	GOV2	11,000	$1.83	Masonry	Concrete Slab	1

Using IEMA's statewide essential and critical facility database, five state-owned essential or critical facilities were identified within FEMA-mapped 100-year floodplains. A Hazus-MH user defined flood loss analysis was performed on each of these facilities to assess the flood exposure and potential flood losses if each of these facilities were to experience a 100-year flood. The estimated flood exposure for these five facilities (total estimated replacement value of structure and content) is $44.75 million. The total estimated flood loss if these structures were inundated to the 100-year flood level is $24.26 million. The exposure and losses estimates for each of these five facilities are as follows:

County	Facility Name	Replacement Cost ($1000s)	Estimated Content ($1000s)	Full Replacement Cost ($1000)	Total Losses ($1000)
Madison	District Headquarters	$ 10,674	$ 10,674	$ 21,349	$ 9,814
Madison	District Headquarters	$ 1,832	$ 2,749	$ 4,581	$ 2,984
Madison	Office Building	$ 1,832	$ 2,749	$ 4,581	$ 2,201
Saline	Office Building	$ 1,180	$ 1,180	$ 2,360	$ 2,223
Jersey	Correction Center	$ 7,916	$ 3,958	$ 11,874	$ 7,045
	Total			**$ 44,745**	**$ 24,268**

Flood exposures and estimated flood losses for Illinois state-owned essential and critical facilities within the 100-year floodplain.
Source: "Illinois Statewide Flood Hazard Assessment" 2013 conducted by: Natural Hazard Research and Mitigation Group (NHRMC) at Southern Illinois University, Carbondale

Severe Winter Storms: Severe winter storms can cut off access to facilities by blocking roads. This not only prevents the public from traveling to the facility to access the services provided there, it can also degrade the emergency response capabilities emanating from that facility. Similar to severe storms and tornados, state facilities would have comparable vulnerability to severe winter storms as other structures within said counties. The INHMP Hazard Methodology indicates that 100% of the population is at risk from a severe winter storm. This was evident on February 1st, 2011 when over 39,000 state workers were ordered not to come into work due to the severe winter weather.

Drought: The effects on state facilities from this hazard are minimal.

Extreme Heat: The effects on state facilities from this hazard are minimal.

Earthquake: Earthquakes as mentioned above can destroy buildings, cut power and block access to the facility, rendering it inoperable to the detriment of the community.

Two Executive Branch documents have had an important impact on improving the natural hazard vulnerability of state facilities from floods and earthquakes. This first document was identified in the development of the 2004 INHMP as an action item. The 1979 version needed to be updated which was accomplished and signed by the Governor on March 7, 2006:

Executive Order Number 5 (2006)

Construction Activities in Special Flood Hazard Areas

All State Agencies engaged in any development within a Special Flood Hazard Area shall undertake such development in accordance with the following:

A. All development shall comply with all requirements of the National Flood Insurance Program (44 C.F.R. 59-79) and with all requirements of 92 Illinois Administrative Code Part 700 or 92 Illinois Administrative Code Part 708, whichever is applicable.

B. In additional to the requirements set forth in preceding Section A, the following additional requirements shall apply where applicable:

1. All new Critical Facilities shall be located outside of the floodplain. Where this is not practicable, Critical Facilities shall be developed with the lowest floor elevation equal to or greater than the 500-year frequency flood elevation or structurally dry floodproofed to at least the 500-year frequency flood elevation.

2. All new buildings shall be developed with the lowest floor elevation equal to or greater than the Flood Protection Elevation or structurally dry floodproofed to at least the Flood Protection Elevation.

3. Modifications, additions, repairs or replacement of existing structures may be allowed so long as the new development does not increase the floor area of the existing structure by more than twenty (20) percent or increase the market value of the structure by fifty (50) percent, and does not obstruct flood flows. Floodproofing activities are permitted and encouraged, but must comply with the requirements noted above.

Executive Order Number 2 (1990)

Executive Order for the Reduction of Earthquake Hazards

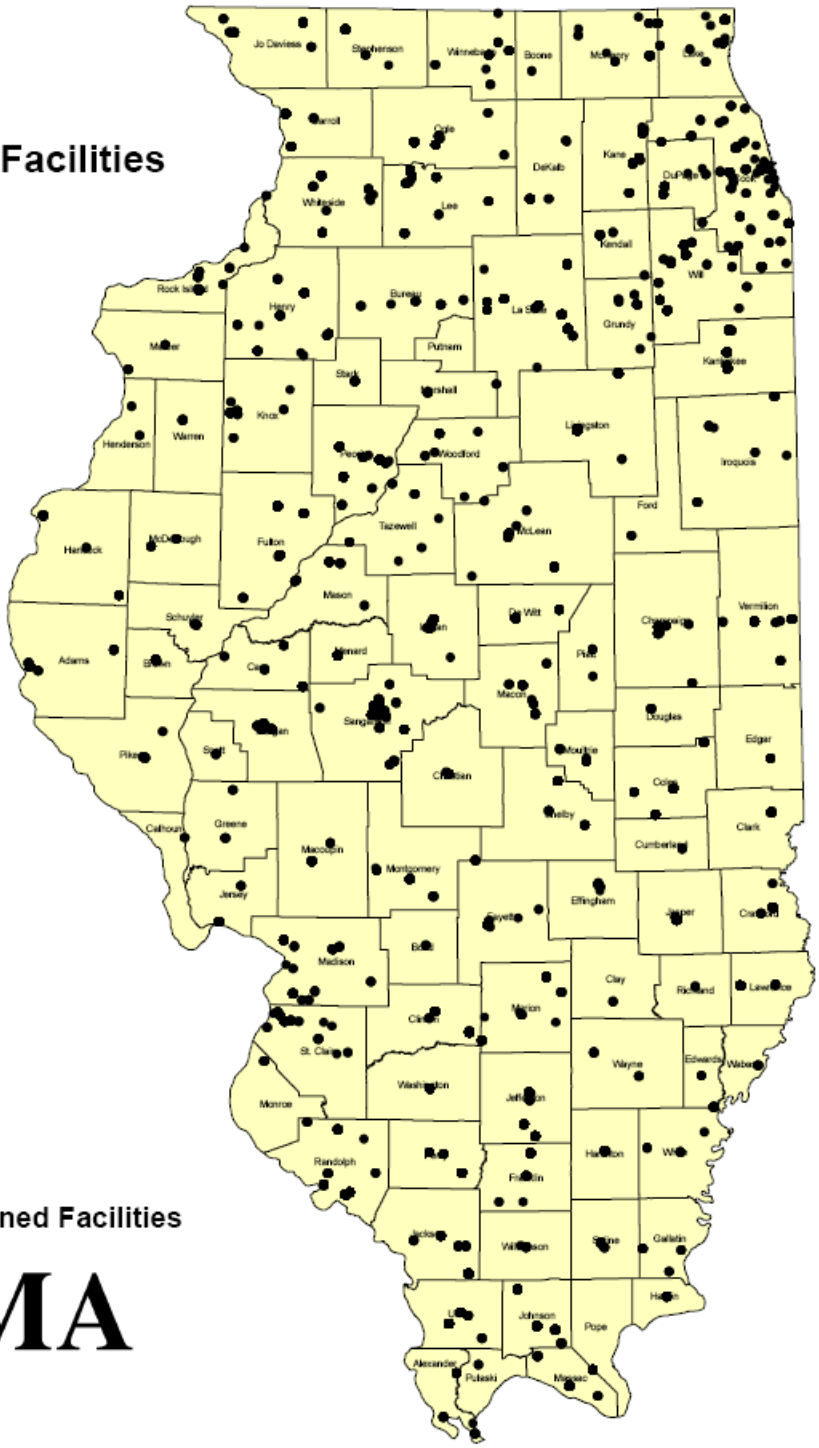
Each State agency responsible for the design and construction of each new State building shall ensure that the building is designed and constructed in accord with appropriate seismic design and construction standards.

State Facilities Attachments:

1) Base Map
2) Severe Storm Map
3) Tornado Map
4) Flood Map
5) Severe Winter Storm Map
6) Drought Map
7) Extreme Heat Map
8) Earthquake Map

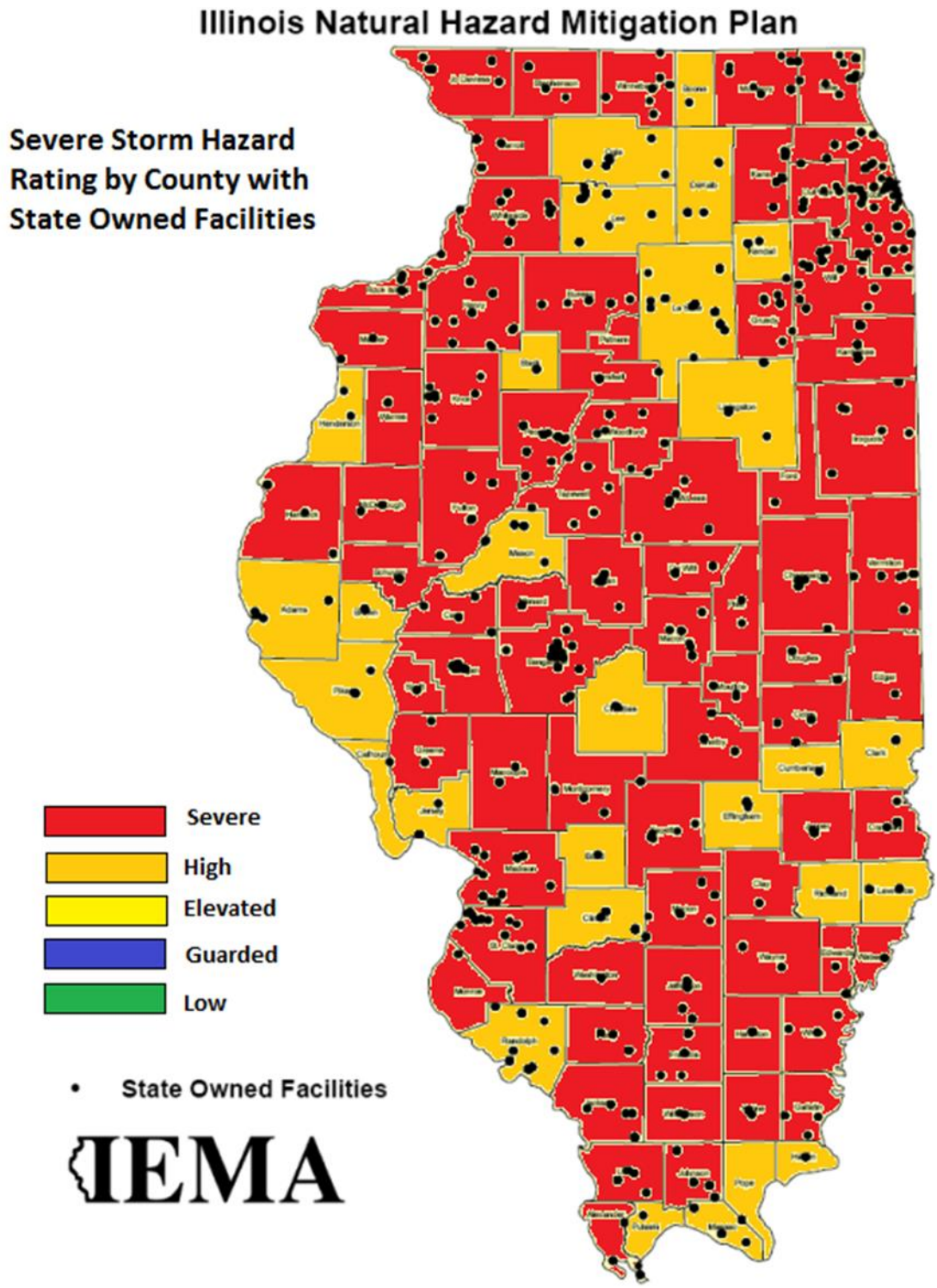
Illinois Natural Hazard Mitigation Plan

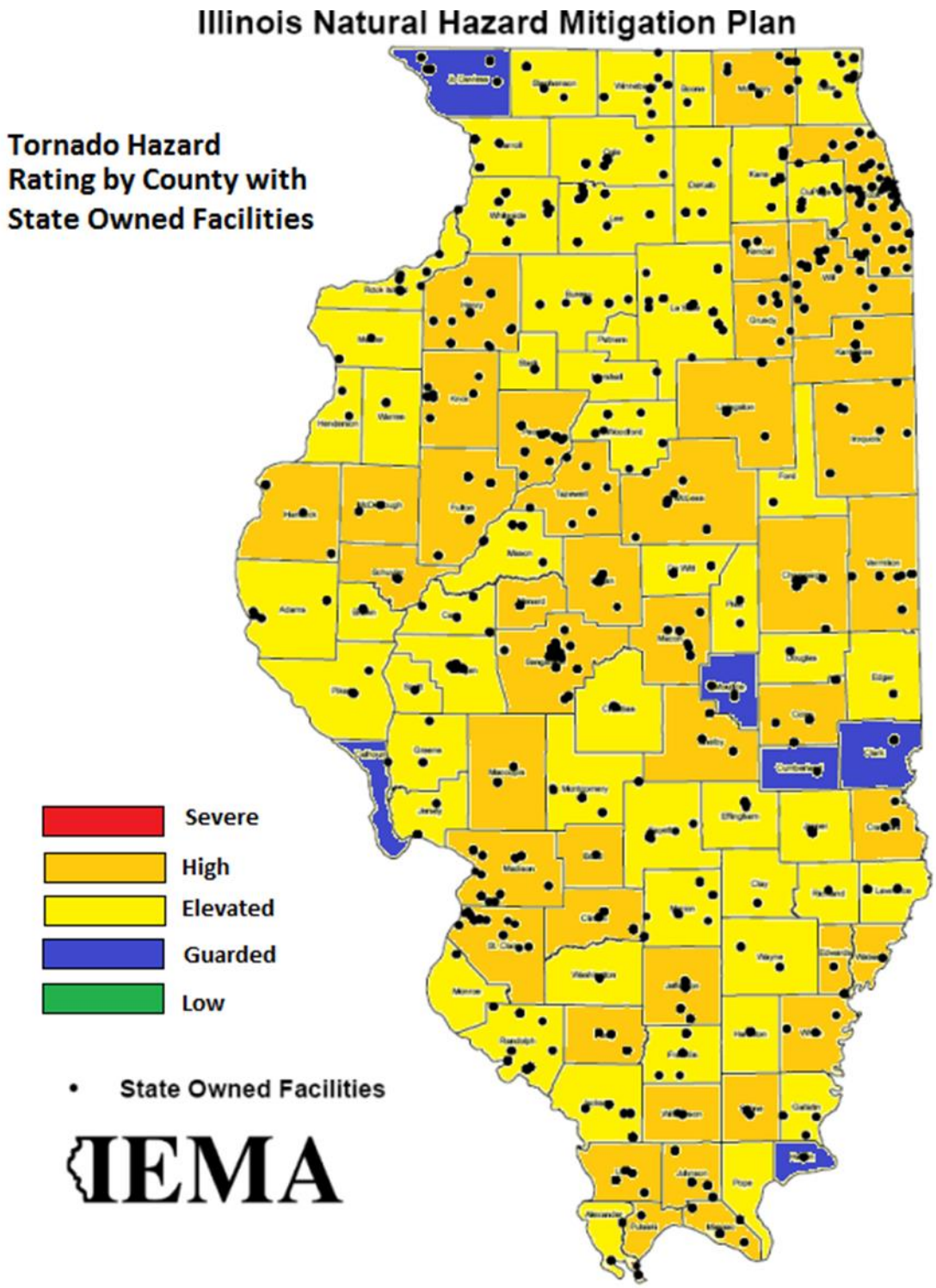
State Owned Facilities

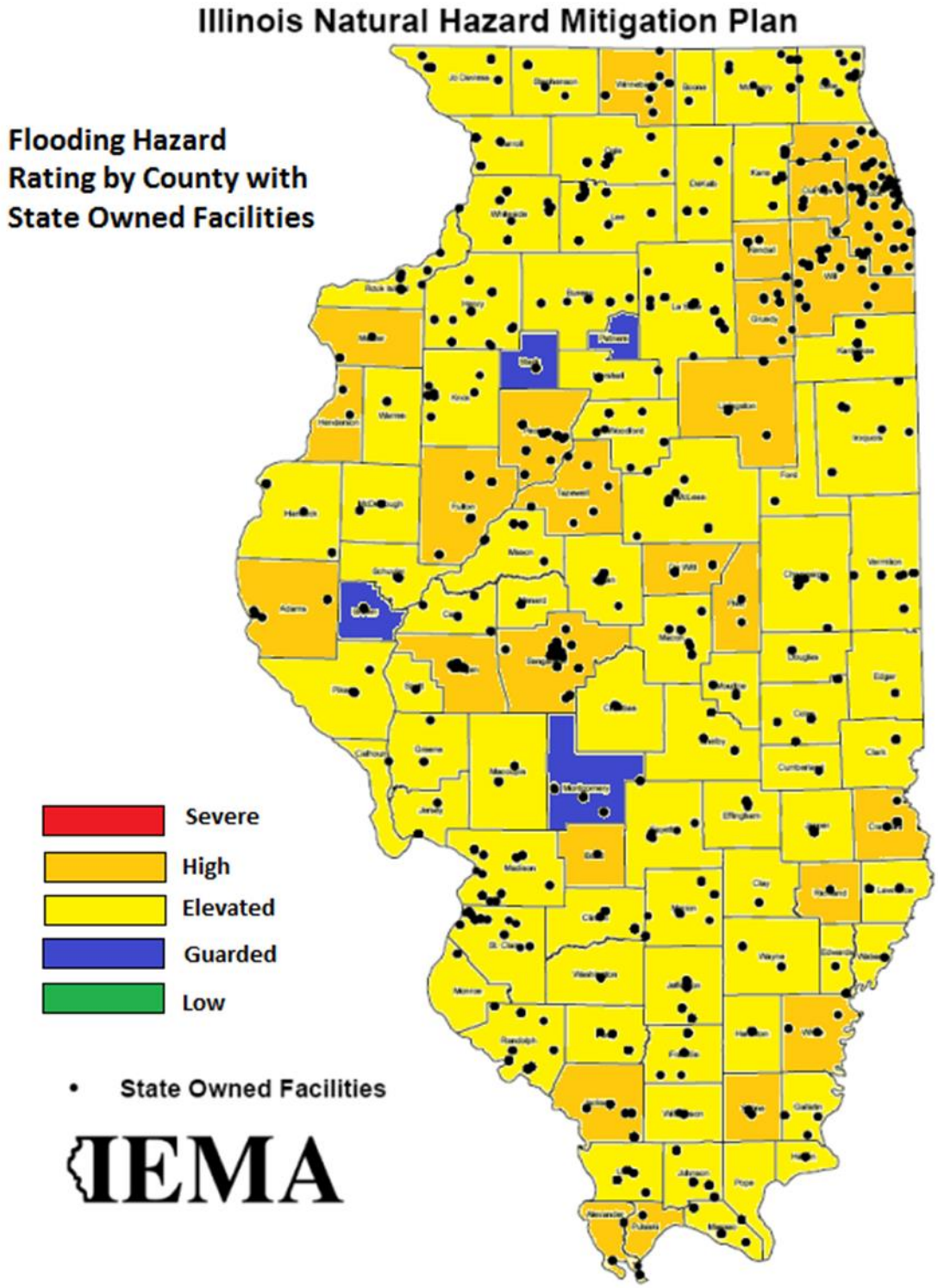


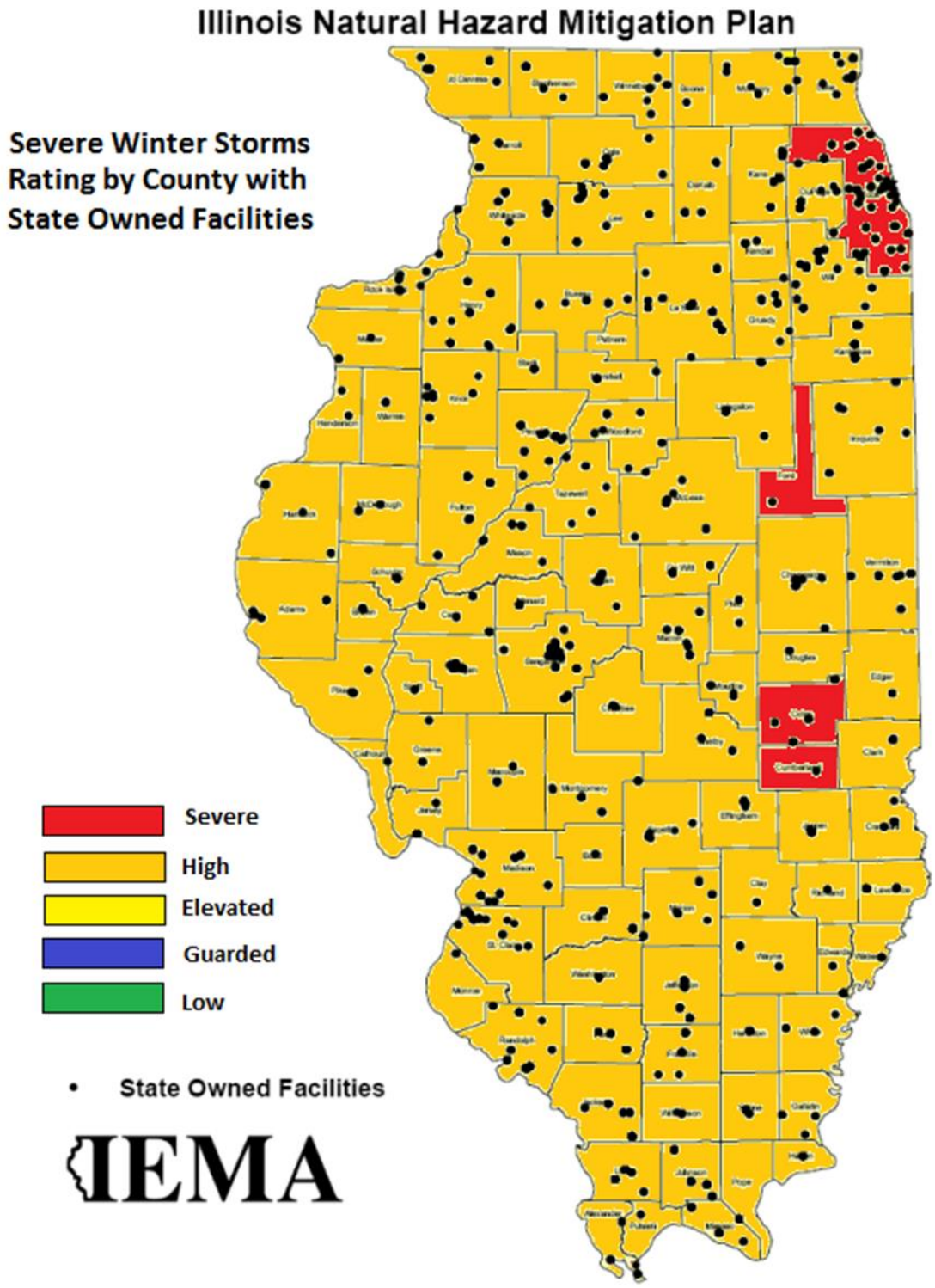
- State Owned Facilities

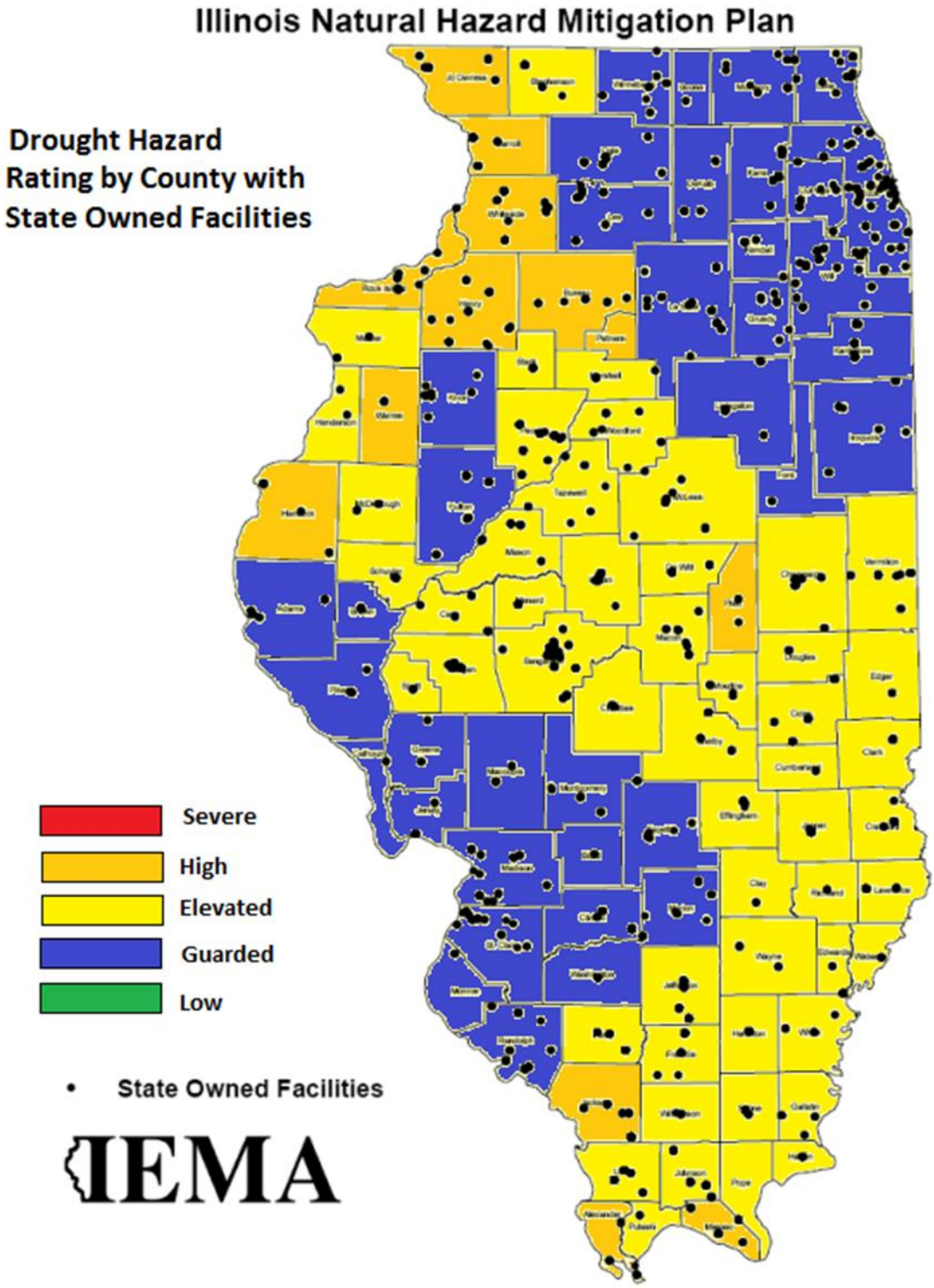
IEMA

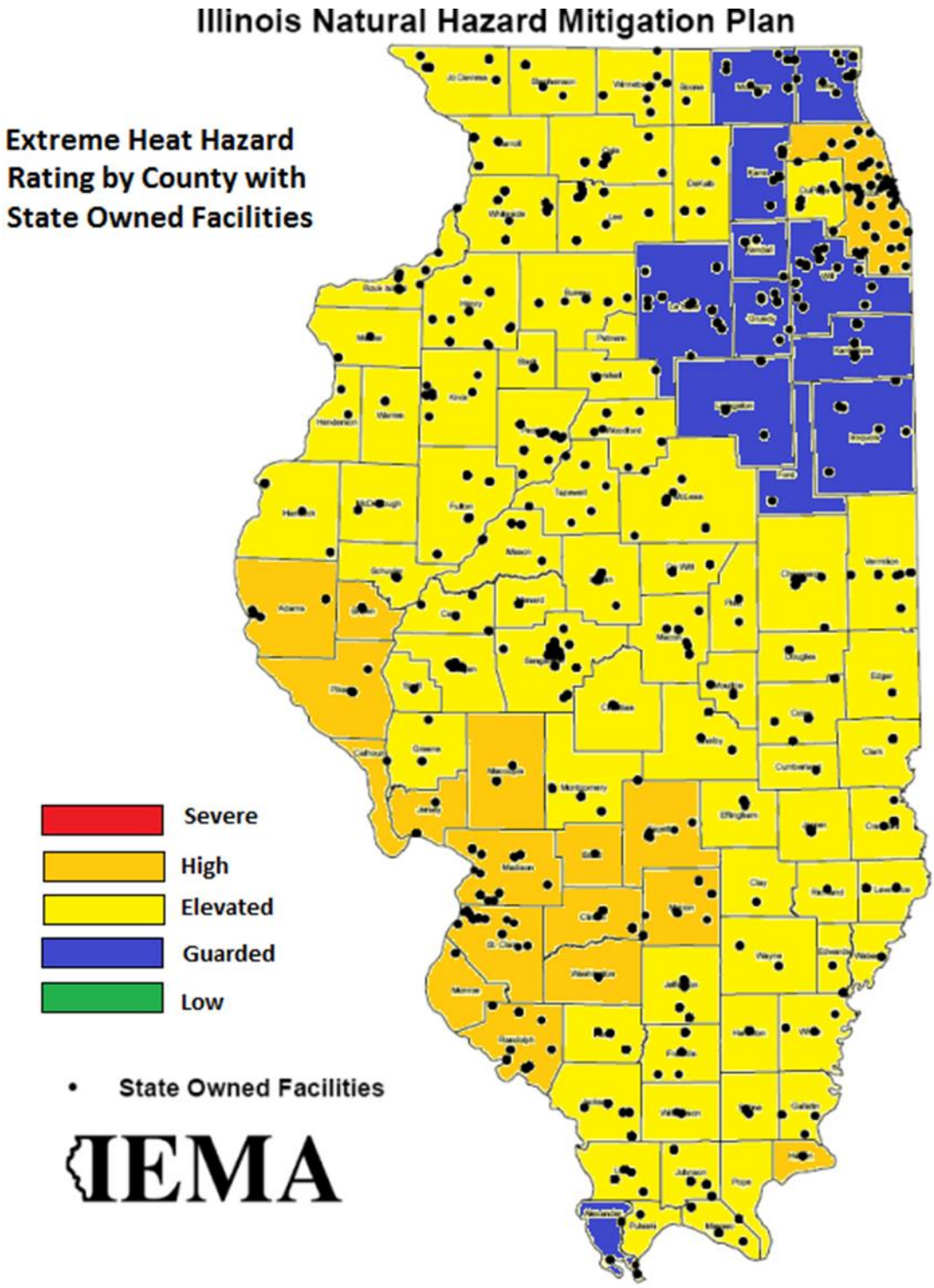

Illinois Natural Hazard Mitigation Plan
Severe Storm Hazard Rating by County with State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA

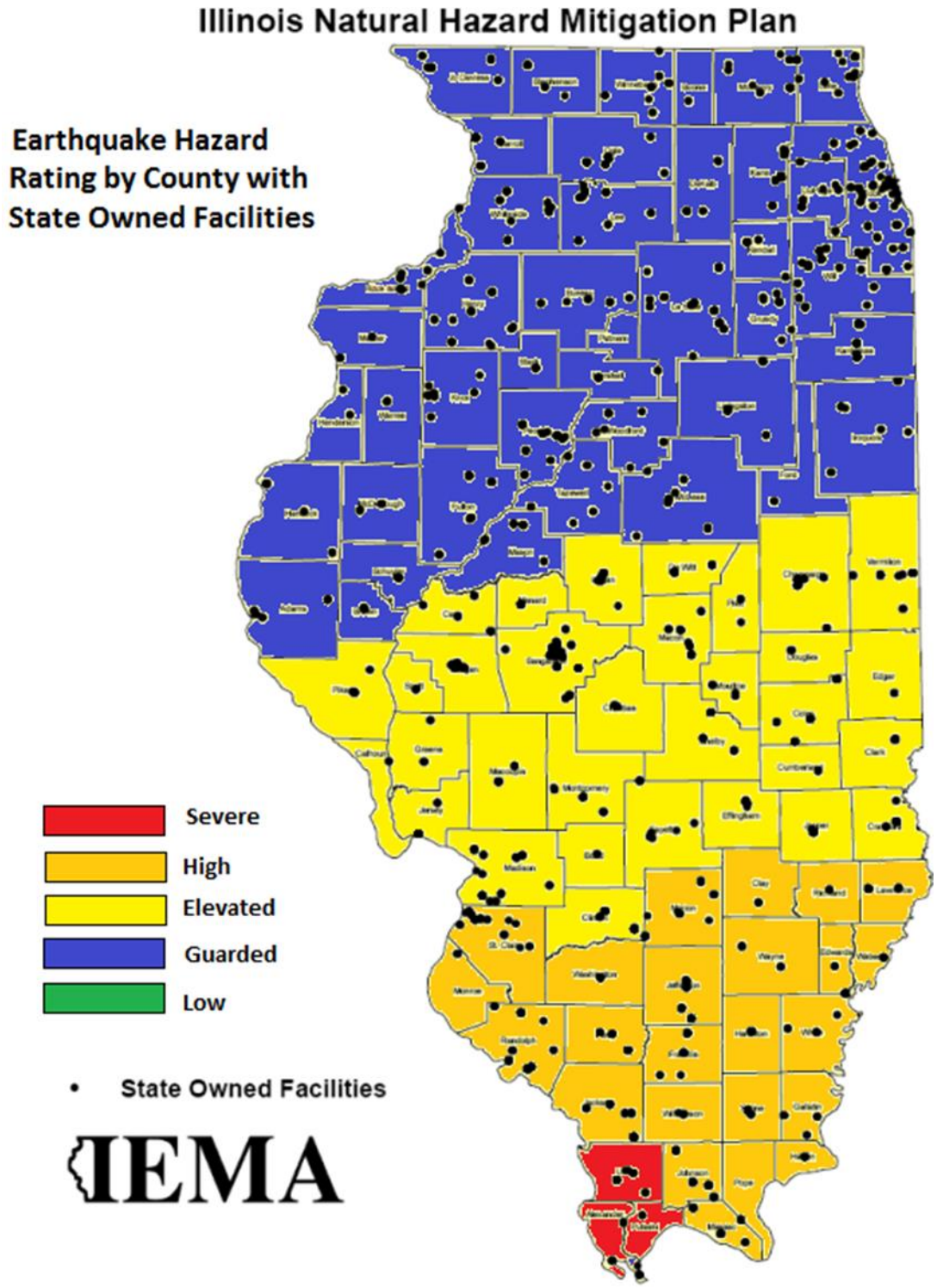

Illinois Natural Hazard Mitigation Plan
Tornado Hazard
Rating by County with
State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA


Illinois Natural Hazard Mitigation Plan
Flooding Hazard
Rating by County with
State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA


Illinois Natural Hazard Mitigation Plan
Severe Winter Storms Rating by County with State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA


Illinois Natural Hazard Mitigation Plan
Drought Hazard
Rating by County with
State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA


Illinois Natural Hazard Mitigation Plan
Extreme Heat Hazard Rating by County with State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA


Illinois Natural Hazard Mitigation Plan
Earthquake Hazard Rating by County with State Owned Facilities
Severe
High
Elevated
Guarded
Low
State Owned Facilities
IEMA

M. Critical Infrastructure

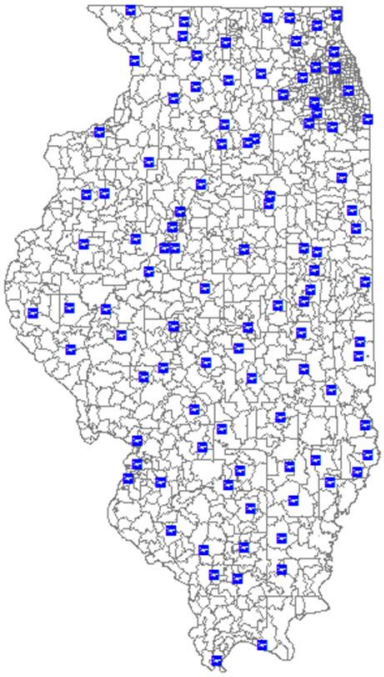
This section discusses the Critical Infrastructure of the State of Illinois and the threat posed to it by the six previously defined natural hazards (Severe Storms and Tornadoes, Floods, Severe Winter Storms, Drought, Extreme Heat, and Earthquake). The Illinois Natural Hazard Mitigation Planning Committee (INHMPC), in compliance with the guidance provided by the Federal Emergency Management Agency (FEMA), has defined eight components that make the State's Critical Infrastructure. The components are: Airports, State Parks and Recreation Areas, the State's Communications Infrastructure, Major Highway Bridges Over Waterways, Major Natural Gas Transmission Lines, Interstate, US and State Highways, Major Electrical Transmission Lines Generating and Relay Stations, Ports and Landings along Waterways. The following paragraphs will describe each component of the State's Critical Infrastructure and the function it serves. We will also catalog the threat posed to each component by each of the six natural hazards. Maps are also available upon request from the IEMA Mitigation Staff for specific critical infrastructure and the hazards that they face. Due to the fact that, the Illinois Natural Hazard Mitigation Plan is a publically accessible document specific critical infrastructure information regarding exact location has been omitted from both the public distribution version and the federal review to ensure security integrity. Specific data and material is maintained by a variety of State agencies including: the Illinois Emergency Management Agency and Illinois Terrorism Task Force and is available for inspection by appropriate and approved emergency management officials only. Illinois has passed specific legislation protecting certain types of homeland and security information from release under the Freedom of Information Act. Illinois' FOIA legislation tends to differ from FEMA's allowing for stricter security protocols.

AIRPORTS

Air transportation plays a vital role in the economy of the State of Illinois and the United States of America as a whole. Aeronautical industry experts surmise that as we move through the twenty-first century the role of air travel will only increase. According to statistics from the Illinois Department of Transportation, Division of Aeronautics, some 48,482,274 people flew into or out of Illinois airports in 2005. The safety of passengers is the number one priority of the aeronautics industry and the Federal Aviation Administration. This has led to numerous rules to protect passengers and minimize the impact of hazards on airport facilities. Weather delays are primarily caused by low visibility, but other natural hazards can create delays.

Severe Storms and Tornadoes: Severe Storms and Tornadoes reduce visibility and create dangerous air currents called "Wind Shear" that can pose a major hazard to navigation. The effects can cause flights to be delayed creating an inconvenience to passengers. Once the weather has passed the airlines focus on getting the flight schedule back to normal. Airports work closely with the National Weather Service to ensure flights do not encounter dangerous conditions.

Floods: All of the publicly owned airports in Illinois are elevated above the base flood elevation with the exception of the Palwaukee Airport, the third busiest in the State, which was recently elevated to a 50-year level of protection. Flash flooding of runways is possible if more rain is deposited on an airport's tarmac than can be handled by the airport drainage system. This is a rare event and results in short term delays.



Severe Winter Storms: Severe Winter Storms can decrease visibility and block runways, closing the airport to navigation. According to the Illinois Department of Transportation, Division of Aeronautics, this creates some delays but it is rare for an airport to be completely closed. The reason is that the airports most threatened by Severe Winter Storms have taken steps to be prepared for these events with snow removal equipment and design considerations.

Drought: According to the Illinois Department of Transportation, Division of Aeronautics, this has no negative impact on aeronautics.

Extreme Heat: In the rare event of extreme heat causing runways of the airport to buckle and crack, it is quickly repaired by the airport maintenance staff.

Earthquake: Earthquakes can buckle runways and cut power, rendering the airport unsafe for use.

STATE PARKS AND RECREATION AREAS

State Parks and Recreation Areas are important social resources for the State of Illinois. Tourism dollars generated by State Parks and Recreation Areas are also an important source of revenue for the State of Illinois and local units of government. Every year thousands of visitors flock to the parks and recreation areas spending their money at the parks themselves and in the communities that surround the parks. Many of the defined natural hazards have posed a threat to these parks and recreation areas. Should these resources be forced to close it could have an extremely detrimental effect on the local community and the State as a whole.

Severe Storms and Tornadoes: Storms and Tornadoes can fell trees, cut power, and deposit debris in the park area, rendering the park unsafe and thus forcing it to close.

Floods: Floods can inundate the park area and force the park to close, costing the State and the local community large amounts of revenue.

Severe Winter Storms: Severe Winter Storms can block the roads that provide access to the park, closing the park to visitors.

Drought: A severe, prolonged drought's effect on a park can be extremely subtle but no less severe than the other listed natural hazards. In many State Parks visitors flock to see the scenic natural wonders that the park provides. If a drought degrades the vegetation and the landscape to a great enough extent, tourists will spend their holiday dollars at other parks, possibly in other states.

Extreme Heat: During Extreme Heat events, holidaymakers are less likely to spend time in parks and recreation area (especially those that do not provide water recreation opportunities) thus costing the State and the local community revenue.

Earthquake: Earthquakes can fell trees and buildings and destroy access roads, making the park not a viable recreation option for tourist.

STATE COMMUNICATIONS INFRASTRUCTURE

The State of Illinois maintains a complex communications system which includes: land-based telecommunications capability, wireless telephone communications, a satellite telephone communications system and low and high frequency radio and paging systems. In order to mitigate against damage to any segment of the State of Illinois communications system, the State has developed a series of redundant emergency backup systems. Should any of the state facilities, which provide a critical communications capability in any region of the State, be rendered inoperable by a natural hazard, emergency backup systems can fill in the communications gap. Detailed plans for when and how the emergency communications backup systems should be employed can be found in the "Communications Annex (ESF2)" of the State of Illinois Emergency Operations Plan.

Severe Storms and Tornadoes: Lightning from severe storms can disrupt radio and telephone communications. High winds from severe storms can fell telecommunications lines and radio towers.

Floods: Floods can inundate communications centers, telecommunications lines and radio towers rendering them inoperable.

Severe Winter Storms: Severe Winter Storms can also sever land-based telecommunications lines when the lines are covered with more snow and ice than the line can support.

Drought: The effects on the State communications infrastructure from this hazard are minimal.

Extreme Heat: Extreme Heat can cause power outages that may have a detrimental effect on the communications infrastructure.

Earthquake: Earthquakes can bring down radio towers, telephone lines and/or the communications centers themselves.

MAJOR HIGHWAY BRIDGES OVER WATERWAYS

Major Highway Bridges Over Waterways are a transportation link vital to interstate commerce. If a bridge should be rendered inoperable by a natural hazard, whole regions of the State may be cut off from the rest of the State and have significant large scale economic consequences. During the Great Flood of 1993, all of the bridges on the Mississippi River from the Interstate 270 bridge at St. Louis to Interstate 74 at Rock Island were inoperable because of flooded approaches. The Illinois River was impassable south of Interstate 36.

Severe Storms and Tornadoes: Storms and Tornadoes can deposit debris on the bridge deck and approaches, closing the bridge to traffic.

Flood: Floods can inundate the approaches to the bridge causing the bridge to be closed to traffic.

Severe Winter Storms: Severe Winter Storms can also block traffic with large amounts of snow.

Drought: The effects on Major Highway Bridges from this hazard are minimal.

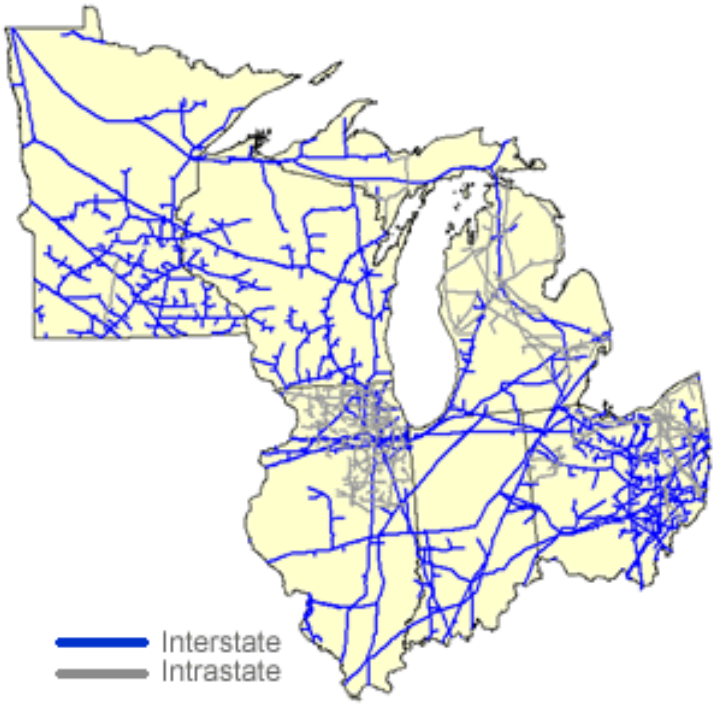
Extreme Heat: The effects on Major Highway Bridges from this hazard are minimal.

Earthquake: Earthquakes can destroy bridges and their approaches.

MAJOR NATURAL GAS TRANSMISSION LINES

Major Natural Gas Transmission Lines perform a vital role for the State of Illinois and the United States of America as a whole. They deliver needed fuel to heat homes during harsh northern winters. They also help deliver fuel to natural gas-fired power plants. Should these lines be damaged or destroyed, especially in the winter, the gravest of consequences could result. According to the U.S. Energy Information Administration, twenty-six interstate and at least eight intrastate natural gas pipeline companies operate within the Midwest Region (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin). The principal sources of natural gas supply for the region are production areas in the Southwest, although Canadian natural gas pipelines now account for about one-fourth of natural gas pipeline capacity entering the region. Regional natural gas production, principally from Ohio and Michigan, accounts for little more than 8 percent of the gas consumed in the region.

Diagram of major pipelines in Illinois
Supplied by U.S. Energy Information Administration



http://www.eia.gov/pub/oil_gas/natural_gas/analysis_publications/ngpipeline/midwest.html

Severe Storms and Tornadoes: Where natural gas lines are exposed above ground they are vulnerable to the high winds of severe storms and tornadoes.

Floods: The effects on Major Natural Gas Transmission Lines from this hazard are minimal.

Severe Winter Storms: The effects on Major Natural Gas Transmission Lines from this hazard are minimal.

Drought: The effects on Major Natural Gas Transmission Lines from this hazard are minimal.

Extreme Heat: The effects on Major Natural Gas Transmission Lines from this hazard are minimal.

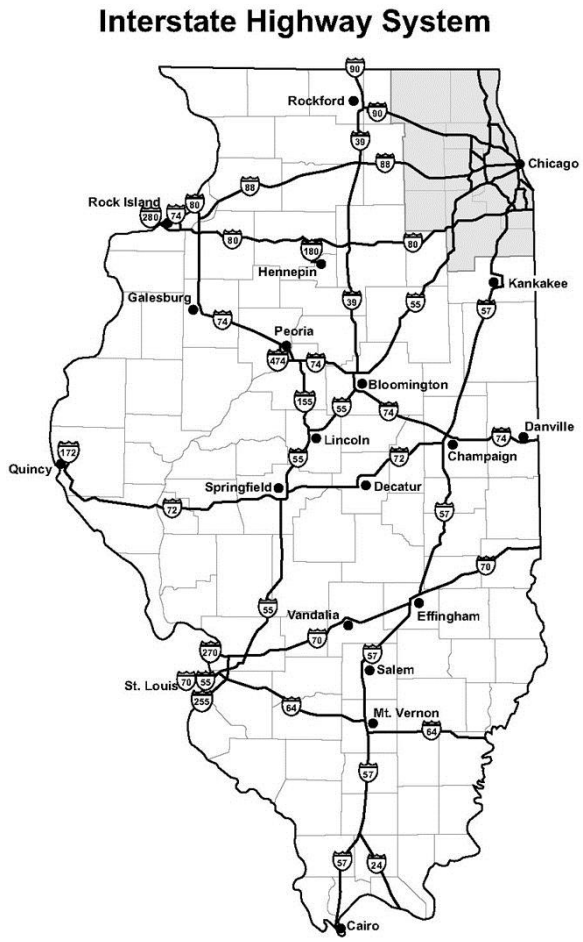
Earthquake: Earthquakes can rupture Natural Gas Transmission Lines, resulting in a loss of service and a potential fire hazard.

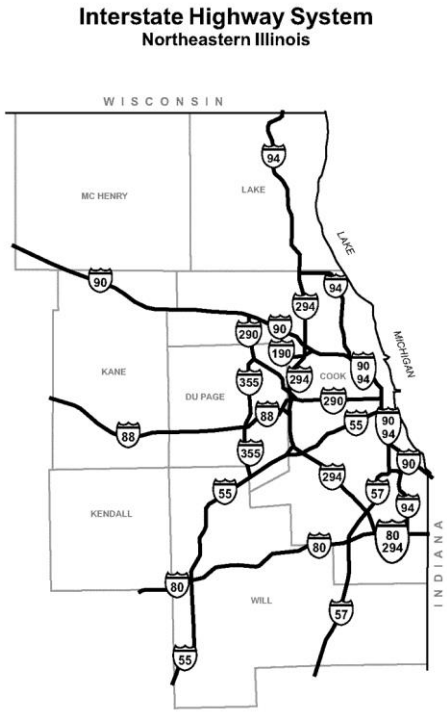
INTERSTATE, US AND STATE HIGHWAYS

Highway systems are a vital component of intestate commerce. According to statistics from the US Trucking Association, every year 15.5 million trucks operate on US roadways. If these transportation arteries were to be cut, the economic consequences would be in the tens of millions of dollars. The Illinois Department of Transportation advises that, Illinois has 2,169.53 miles of interstate highways and ranks third in the nation in interstate miles; only Texas (3,233.45 miles) and California (2,455.74 miles) rank ahead of the Land of Lincoln. In Illinois, over 29 percent of all public travel is done via the interstates and over 60 percent of all truck travel. The busiest segment of the Illinois interstate system in 2004 was along Interstate 90/94 (the John F. Kennedy Expressway in Chicago) just north of Chicago Avenue, where an average of 332,400 vehicles use the highway daily. The least traveled Illinois interstate was Interstate 180 in Bureau County, which carries an average of 2,000 vehicles daily.

Severe Storms and Tornadoes: Can deposit debris on roadways closing them to traffic.

Floods: Floods can inundate or washout roadways rendering them impassable to traffic. The number one cause of death from flooding is drowning caused by people trying to drive cars through moving water.





Maps Supplied by the Illinois Department of Transportation

Severe Winter Storms: Severe Winter Storms can block roadways with large amounts of snow and ice.

Drought: The effects on roadways from this hazard are minimal.

Extreme Heat: Extreme Heat can cause roadways to buckle, posing a hazard to traffic.

Earthquake: Earthquakes can sever roadways and stop the flow of traffic.

MAJOR ELECTRICAL TRANSMISSION LINES,

GENERATING AND RELAY STATIONS

Electricity is the fuel that powers our society. Power outages can severely disrupt everyday activities, create large losses of refrigerated products, and have even been known to cause riots. Lack of power for heat or air conditioning can endanger lives.

Severe Storms and Tornadoes: Can knock down power lines and disrupt service.

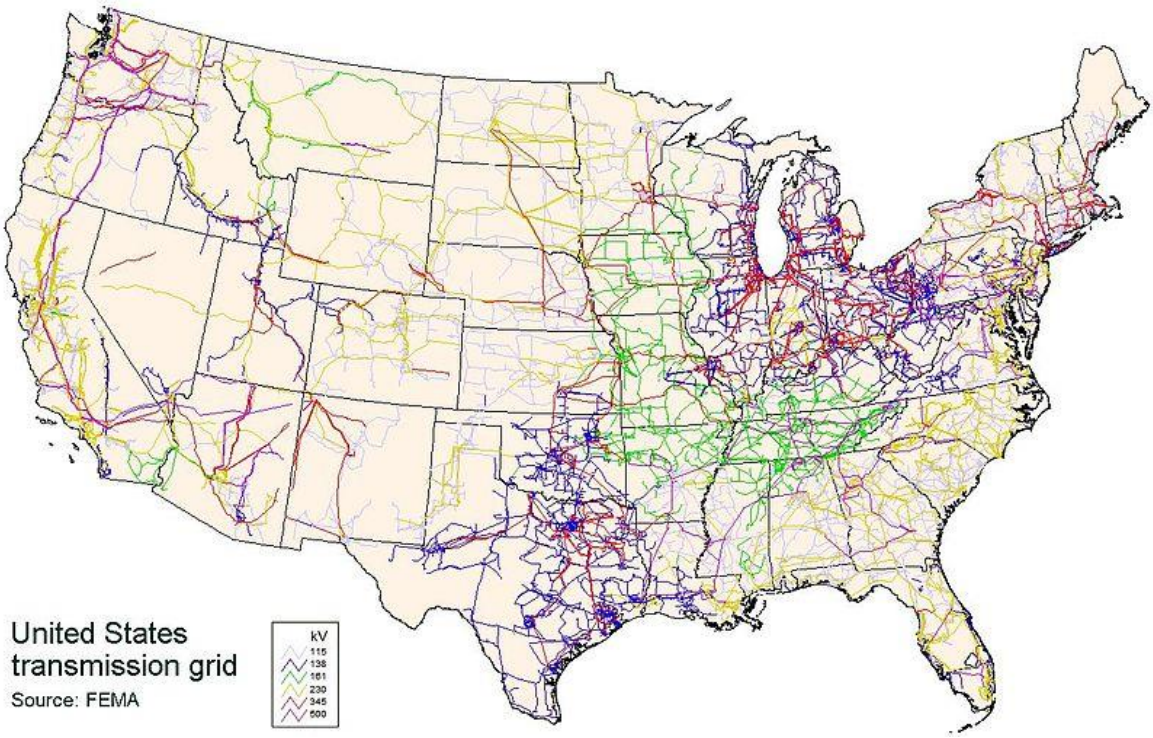
Floods: Floods can inundate Relay Stations and render them inoperable.

Severe Winter Storms: Severe Winter Storms can bring down power lines, when they deposit large amounts of snow and ice on them.

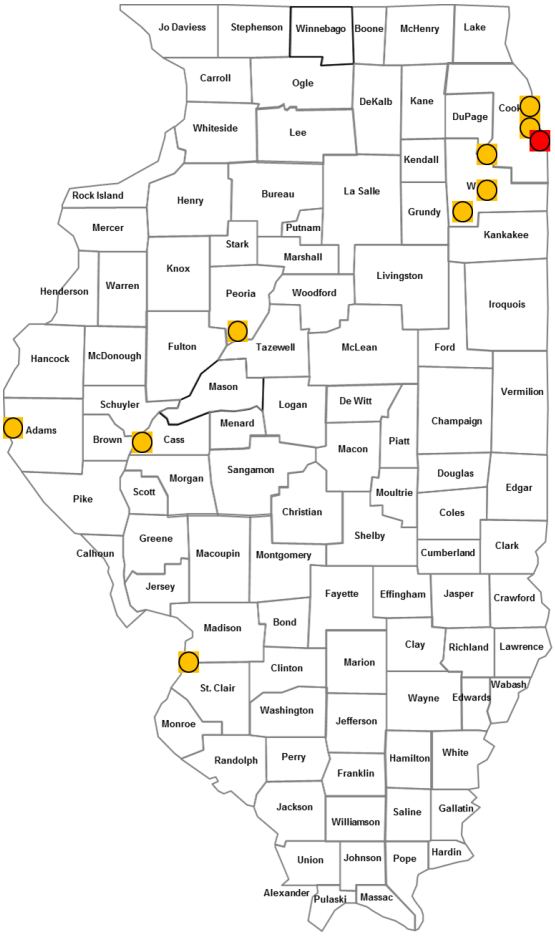
Drought: Drought has no significant impact on power stations. Less than one-tenth of one percent of Illinois's power comes from hydroelectric dams.

Extreme Heat: Extreme Heat can cause power outages when increased public demand for power outpaces the generating station's ability to produce power.

Earthquake: Earthquakes can sever transmission lines and destroy generation and relay stations.



PORTS AND LANDINGS ALONG WATERWAYS



Ports and Landings are vital to the economy of Illinois. Ports along Lake Michigan provide raw materials and finished goods for sale in markets around the world. Landings along the rivers of Illinois provide the agricultural industry important links to markets around the world. According to 'World Port Source", Illinois has 11 major ports; including the Port of Chicago with consists of several port facilities within the City of Chicago. Illinois ranks 7th largest in U.S. Customs Districts for export and imports. Ports and Landings are threatened by several of the previously defined natural hazards.

Severe Storms and Tornadoes: Can cause turbulent waters that make navigation impossible, closing the port or landing to navigation costing operators and consumers thousands of dollars a day.

Floods: Floods can inundate the port or landing, once again closing it to navigation, and subjecting citizens to substantial monetary loss.

Severe Winter Storms: Severe Winter Storms can block waterways with large amounts of snow and ice.

Drought: Droughts can lower the water levels at ports and landings making it impossible to land boats and carry out commerce.

Extreme Heat: The effects of Extreme Heat on Ports and Landings are minimal.

Earthquake: Earthquakes cause waves that could swamp and destroy Ports and Landings and can also destroy the Port or Landing itself through violent ground motion.

IV. Mitigation Strategy

MISSION STATEMENT

The mission of the Illinois Natural Hazard Mitigation Plan is to identify natural hazards which affect Illinois, assess the vulnerability of Illinois to each hazard and implement a strategy for mitigating the effects of the hazards.

VISION STATEMENT

The State of Illinois will implement a comprehensive mitigation program to reduce the effects of natural hazards within the State. This program will educate the public on mitigation methods they can use in their homes and businesses, promote local mitigation planning and assist eligible organizations with the development of mitigation projects. Federal, State and local government resources, along with private resources, will be used to support cost-effective mitigation measures.

The Illinois Natural Hazard Mitigation Planning Committee met to review and update the risk assessment and to discuss the goals and objectives for the State Hazard Mitigation Plan. During the update process, individual meetings between IEMA mitigation staff and individual state agency representatives were conducted to provide a more focused look at cooperating State Agency involvement in the mitigation goals and actions. These focused meetings resulted in an accumulation of additional action items, which will help to further the mitigation efforts within the state. The state's goals are long-term general guidelines to establish and serve as the State's vision and direction for hazard mitigation and loss reduction measures. The overriding goal is to reduce the damages to people and property from natural hazards. Consistent with Illinois' all-hazard philosophy, we have chosen not to make separate goals for each hazard, since most of the activities apply to all hazards. Instead we have chosen to break the goals down by the groups that are affected by disasters and who play a role in mitigating them. Goal one was updated to show the enhancement of the State's capacity to continuously protect lives, health, and safety of the citizens in Illinois form the impact of natural hazards. This was updated from the original goal identifying IEMA's capacity to meet these needs. It was discussed that the capacity should be the

State's versus a singular agency. This goal is supplemented with objectives and actions that support mitigation through the state in a variety of manners. The second goal is for local jurisdictions and how the mitigation partners can work with them to strengthen mitigation. The third goal is the interaction among agencies for the purpose of mitigation. The final goal was updated to focus on individuals and how we can educate and involve them in mitigating their hazards. Under each objective is a list of specific mitigation actions to accomplish or support the objectives and ultimately the goals.

While in draft form, a thorough evaluation of each mitigation action item identified in the Mitigation Strategy was conducted by the Illinois Natural Hazard Mitigation Planning Committee or the State Hazard Mitigation Officer. The action items were prioritization utilizing the STAPLEE method. A detailed description of the method maybe found in Section V of the INHMP. Factors in the prioritization of the action items included: cost-effectiveness, environmental consideration, technically feasibility, legality, political support, social acceptability and administrative elements such as funding and staffing availability. A traditional ranking approach was not utilized as the INHMP Mitigation Strategy is viewed as an all-encompassing process which utilizes each identified action item to accomplish the strategy's goals. The mitigation action items were divided into four categories of prioritization: ongoing, annually, within three years, and in the event of a disaster.

The mitigation action items were divided into four categories of prioritization: ongoing, annually, within three years, and in the event of a disaster. These prioritization categories were left unchanged in the update process as they remained an accurate depiction of the prioritization. The ongoing category is the largest group and covers the activities that are necessary to maintain a quality state-run hazard mitigation program. These activities take priority as they are the activities that need to be done on a regular basis, which are done as requested, or are ongoing projects that are worked on as time allows. Most of these projects have no cost beyond staff time.

The actions that are labeled "annually" are projects that should be completed once a year. Most of these are associated with events, such as conferences, that only occur once a year. The rest are projects that are not worked on a regular basis but need to be updated or redone once a year. Some of these actions are associated with funding that is available through an annual grant cycle.

The third category is items to be completed within three years. These actions involve the gathering of data that is to be completed by the time of the next State Hazard Mitigation Plan update.

The final category is the actions that occur in the event of a disaster. These are actions that do not occur on a regular basis but that need to take place if a disaster is declared. Some of these involve providing information in the aftermath of a disaster; others are associated with funding that becomes available in the event of a disaster.

There are several common themes to the action items. Building a team of people from agencies outside IEMA which support and promote mitigation is essential. The mitigation staff is limited and for mitigation to take root and grow it must do so by forming partnerships with groups outside of IEMA. To maximize the mitigation resources it is important to run the program as efficiently as possible with as little wasted effort as possible and with an emphasis on minimizing expenditures.

Another major theme is that developing a positive view of mitigation is vital to its growth. People that work with mitigation projects need to come away with a positive experience and the successes of the program must be promoted. One of the ironies of a successful mitigation program is that when a disaster occurs nothing happens. Implementation of the projects must be made as trouble free as possible to provide the programs with a positive reputation. Successful projects which are difficult to administer limit the number of jurisdictions willing to attempt projects. Efforts must be made to promote the success stories so the public, policy makers, and elected officials view mitigation as a worthwhile and cost beneficial program.

The other major theme is the role of education in promoting mitigation. We have to make people understand what mitigation is and how they can use it to lessen the impact of hazards in their lives. There are finite funds that are insufficient for mitigating hazards that affect millions of people. The most effective tool we have is to educate people on the risks they face and the proper techniques to mitigate the risks. We are trying to reach a wide variety of people with the mitigation message, so we need to use a variety of methods. To ensure that the public absorbs the message the mitigation message must be repeated again and again. We must expose the public to mitigation concepts as many different ways and as many times as possible. This is how businesses promote

products and how we must promote mitigation. We cannot demand that people mitigate so we must educate people to demand mitigation.

The 2013 plan was updated to identify specific lead agencies and supporting agencies for each of the identified actions. In addition, an update status section was added to the mitigation action items header category to identify what the current status is of the identified action item. The action items have been categorized with the follow title(s):

- Updated, indicates that the original action items was updated with current information and/or supporting agencies were identified to assist with the action.
- Complete; denotes that the action has been completed since the update of the previous plan.
- Unchanged; identifies that the action has been reviewed and remains a viable and accurate action item for the State of Illinois, but due to specific challenges the actions has not been completed or initiated.
- Continuing; indicates that the action item has been reviewed and remains a viable action within the plan and that the action is continually being completed or that initial steps have begun regarding the actions completion.
- New, designates that that particular action was created new in the update. These “New” action items were prioritized utilizing the same approaches as utilized with past actions.

UPDATED MITIGATION STRATEGY ITEMS

Throughout the update process the planning committee reviewed all mitigation goals, objectives, strategies and actions to evaluate their effectiveness and determine if additional actions were required in order to reach the identified mitigation goals. In additional, support agencies were added to many of the actions in order to assist in the facilitation of the actions. The following are all updated or new migration strategies to the Mitigation Strategy Section:

Goal 1: Maintain and enhance the State of Illinois capacity to continuously protect the lives, health, and safety of the citizen in Illinois from the impact and effects of natural hazards.

- Updated Goal

Goal 4: Increase public understanding, support, education and demand for hazard mitigation planning and projects to protect public services, utilities and critical facilities from potential damage from natural hazard events.

- Updated Goal

Strategy 1.2.4. Improve Management

- Added Action 1.2.4.2. Hire additional mitigation staff to assist with mitigation planning and projects.

Strategy 1.2.5. Ensure Timely Process

- Added Action 1.2.5.2. Have Local Mitigation Project applications ready for submittal within 6 months from the disaster declaration date.

Strategy 1.3.1. Incorporate geographic information system (GIS) as a tool in decision making

- Added Action 1.3.1.6. Training current mitigation staff positions in GIS software and application.
- Added Action 1.3.1.7. Coordinate with State agencies to develop specific agency database with GPS latitude and longitude coordinates of their entire agency specific buildings.
- Added Action 1.3.1.8. Coordinate with the Illinois Commerce Commission and other state agencies to explore grant funding opportunities to develop a comprehensive state facility database.

Strategy 1.3.2. Cooperate and coordinate with partners at all government levels in planning and use of best technology.

- Added Action 1.3.2.4. Develop an all-encompassing geodatabase of levees within the State including areas at risk of flooding if they are overtopped or fail.

Strategy 1.3.3. Increase the use of best technology in Grants Management.

- Added Action 1.3.3.2. Develop a standardized grants management tracking system.

Strategy 2.1.1. Conduct mitigation presentation for local public officials.

- Added Action 2.1.1.3. Contact township and County Highway associations to present mitigation ideas to their membership.
- Added Action 2.1.1.4. Include information regarding mitigation activities for natural hazards on the ReadyIllinois.gov website.

Strategy 2.1.2 Conduct training courses for local public officials.

- Update Action 2.1.2.1 Conduct interactive "Mitigation Planning Workshops" and mitigation training classes.

Strategy 2.1.3. Provide information on mitigation for publications with a target audience of public officials.

- Updated Action 2.1.3.1 Work with State Agency PIO's on writing and distributing articles.
- Added Action 2.1.3.3. Create publications to distribute regarding agency coordinated or funded mitigation projects.

Strategy 2.1.4. Provide jurisdictions with the necessary resources to evaluate their community building codes highlighting the impact of safe buildings on local residents.

- Added Action 2.1.4.3. Explore possibilities for the creation of a mobile support team and legislation to provide technical engineering and architectural staff capable of assessing the structural safety of facilities for disaster resilience.
- Added Action 2.1.4.4. Provide instructional and training opportunities for local code officials to enable them to conduct pre-disaster assessments of structural safety of facilities for disaster resilience. (ongoing)

Strategy 2.2.2. Publicize and provide risk assessment products and planning services to assist local officials throughout the local mitigation planning process.

- Added Action 2.2.2.3. Create an all-encompassing source of past natural hazard occurrences including impact data in Illinois for future planning efforts.
- Added Action 2.2.2.4. Conduct public health hazard risk assessments at all local health departments throughout the state.

Strategy 2.3.1. Continuously demonstrate the importance of pre-disaster mitigation planning to local public officials and promote the availability of PreDisaster Mitigation (PDM) resources.

- Added Action 2.3.1.3. Make HMGP planning grant funds available to Non-NFIP compliant counties for the development of a natural hazard mitigation plan.

Strategy 2.4.2. Encourage communities to adopt strong local floodplain regulations to reduce future flood losses.

- Added Action 2.4.2.3. Provide public education and continued enforcement of septic and sewer regulations in floodplains.
- Added Action 2.4.2.4. Identify public water supply sources repeatedly affected by flooding and encourage mitigation efforts to limit losses associated with water quality.

Strategy 2.4.4. Use new technologies such as GIS with high resolution, current topography, lidar, orthophotography and digital floodplain mapping (DFIRM) as a tool to increase flood hazard awareness and risk reduction.

- Updated Strategy
- Added Action 2.4.4.6. Incorporate the RiskMAP program into mitigation project and planning efforts.

Strategy 2.4.5. Support the Illinois Association for Floodplain and Stormwater Managers (IAFSM) programs, including education and communication.

- Added Action 2.4.5.5. Ensure IAFSM Board membership participation in the States Hazard Mitigation Planning Meetings.

Strategy 2.4.6. Ensure that all State funded or State promoted activities are consistent with sound floodplain management principles.

- Added Action 2.4.6.3. Develop Executive Order workshops for state agencies.
- Added Action 2.4.6.4. Create Executive Order instructional book for guidance.

Strategy 2.4.7. Assure minimum flood protection standards are met and promote higher floodplain management standards in all jurisdictions.

- Added Action 2.4.7.6. Develop and conduct workshops for local officials regarding flood protection standards.
- Added Action 2.4.7.7. Conduct community audits to ensure compliance with minimum flood standards.

Strategy 2.5.2. When available, allocate federal and state grant funding to local governments (or other eligible recipient) for the purpose of developing local mitigation plans.

- Added Action 2.5.2.2. Coordinate with other State and Federal Agencies to assist communities with obtaining assistance for the 25% local match, when available and meets regulations.
- Added Action 2.5.2.3. Facilitate partnerships between benevolent/faith based groups and local jurisdictions to provide assistance for 25% local match, when available and meets regulations.

Objective 2.7 Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion or renovation.

- New objective

Strategy 2.7.1. Utilize disaster related impact and response information, to determine potential mitigation project locations.

- New strategy
- Added Action 2.7.1.1. Use Public Assistance numbers to identify locations which experience continual infrastructural damage.
- Added Action 2.7.1.2. Provide hazard mitigation presentations for local officials directly following a disaster.

Strategy 2.7.2. Develop partnerships with private and public sector organizations to promote and implement mitigation planning efforts and improvement of disaster resistance of buildings.

- New strategy
- Added Action 2.7.2.1. Involve the Illinois Electrical Cooperatives Association and Municipal Elective Cooperatives in mitigation planning efforts and studies.
- Added Action 2.7.2.2. Engage private sector business to promote disaster resistant building and retro fitting of existing buildings in Illinois.
- Added Action 2.7.2.3. Coordinate with Non-profit groups that provide services of a governmental nature, to address mitigation efforts with in their organization.
- Added Action 2.7.2.4. Encourage higher education institutions to complete campus specific mitigation plans and risk assessments.
- Added Action 2.7.2.5. Encourage private or parochial schools to complete campus specific mitigation plans and risk assessments.
- Added Action 2.7.2.6. Attempt to incorporate Code Plus construction into future state facility site construction of new or existing structures.
- Added Action 2.7.2.7. Attempt to incorporate Code Plus construction into future historic facility site construction of new or existing structures.
- Added Action 2.7.2.8. Attempt to incorporate Code Plus construction into future school facility site construction of new or existing structures.

Strategy 2.7.3. Continue to evaluate mitigation measures and projects for state agencies and facilities.

- New strategy
- Added Action 2.7.3.1. Review the risk assessment to determine potential mitigation projects for state facilities.
- Added Action 2.7.3.2. Develop a prioritized mitigation project list for state facilities, focusing on critical facilities.
- Added Action 2.7.3.3. Utilize past disaster intelligence information to identify possible mitigation projects for state critical and essential facilities.

Strategy 3.3.1. Educate organizations on the theory and practice of hazard mitigation and help them to identify how mitigation can become incorporated into their own routine functions or activities.

- Added Action 3.3.1.2. Survey state facilities to determine the presence of a NOAA weather alert radio and severe weather response plans. Provide information about NOAA radios and seek funding sources to obtain weather radios for facilities lacking them.
- Added Action 3.3.1.3. Develop an Economic Recovery Framework to help businesses recover following a disaster.
- Added Action 3.3.1.4. Target business –related mitigation materials to vulnerable areas.
- Added Action 3.3.1.5. Develop storage instructions and directives regarding mitigation techniques for storage of historic artifacts and documents being stored in below grade locations such as basements.

Strategy 3.3.2. Assist other state agencies in identifying structures located in hazardous areas.

- Added Action 3.3.2.5.Create and maintain a tracking system for all Privately Owned Wastewater Treatment Systems.
- Added Action 3.3.2.6. Perform hazard mitigation reviews for electric, natural gas, and water utility construction projects.
- Added Action 3.3.2.7. Survey State Historic Sites to determine shelter locations and availability for visitors and staff.

Strategy 3.4.1. Develop and track joint mitigation/conservation projects with IDNR, DCEO, DOA, land trusts and environmental groups

- Added Action 3.4.1.3. Continue to maintain and improve the "Local Mitigation Action Item Database" to track local mitigation plan actions and associated projects. (ongoing)

Strategy 4.1.1. Coordinate with key local officials to determine local issues and concerns as well as local, state and federal actions previously taken.

- Added Action 4.1.1.3. Attend additional conference to make presentation regarding mitigation and funding available.

Strategy 4.3.2. Establish methods for outreach.

- Updated Action 4.3.2.5. Provide grant funds to the Illinois Association for Floodplain and Storm Water Management to develop and maintain an interactive flood mitigation website that identifies mitigation activities to minimize flood damage.

Strategy 4.3.4 Execute delivery.

- Added Action 4.3.4.5. Develop web based publications regarding mitigation methods, utilizing an all hazards approach.

Strategy 4.7.2. Document and disseminate information on losses avoided.

- Added Action 4.7.2.5. Distribute hazard mitigation material to insurance companies, agents, and consumers to assist in the development, establishment and implementing of statewide mitigation programs.

A. Goals, Objectives, Actions and Funding

GOAL1. Maintain and enhance the State of Illinois's capacity to continuously protect the lives, health, and safety of the citizens in Illinois from the impact and effects of natural hazards, while lessening the State's vulnerability to natural hazards.

Objective 1.1. Institutionalize Hazard Mitigation.

Strategy 1.1.1. Attract and retain qualified, professional and experienced Hazard Mitigation staff.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.1.1.1. Provide high quality in-house training. **(ongoing)**	General Revenue Funds	Training will increase the skills of the mitigation staff.	A well-trained staff can more effectively manage mitigation programs.	Continuing
Action 1.1.1.2. Encourage professional development and certification through outside continuing education courses. **(ongoing)**	General Revenue Funds	Continuing education increases the skills of the mitigation staff.	Professional development improves the execution of mitigation programs.	Continuing Training opportunities listed on IEMA webpage
Action 1.1.1.3. Allow staff members to travel and attend relevant conferences. **(ongoing)**	General Revenue Funds	Conferences increase the knowledge base of the mitigation staff and provide networking that can form relationships and provide ideas.	Conferences provide opportunities to spread mitigation ideas and to get ideas that make the staff more effective.	Continuing
Action 1.1.1.4. When appropriate, provide membership fees for professional organizations. **(ongoing)**	General Revenue Funds	It is important for staff members to be involved with their professional organizations.	Professional organizations provide training, information, and connections that improve the abilities of the staff to execute the programs.	Continuing

Strategy 1.1.2. Educate and assist the Illinois General Assembly in developing state legislation that will further hazard mitigation efforts.
Lead Agency: (IEMA)
Supporting Agency: (IDNR)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.1.2.1. Notify elected officials of grants and success stories in their jurisdictions. **(ongoing)**	General Revenue Funds	For virtually no cost, mitigation can be promoted by giving positive information about areas the officials are concerned about.	By understanding the positive ramifications of mitigation, elected officials are more likely to support it.	Continuing
Action 1.1.2.2. Support IDNR/OWR's Flood Mitigation Program. **(ongoing)**	General Revenue Funds	IDNR's program is an important partner and we need to inform all the elected officials we work with of this.	Without the IDNR Flood Mitigation Program, many jurisdictions would be unable to provide the local match.	Continuing

Strategy 1.1.3. Expand Mitigation Opportunities.
Lead Agency: (IEMA)
Supporting Agency: (IDNR, IESMA & DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.1.3.1. Publicize program successes through news media or on the web. **(ongoing)**	General Revenue Funds	By promoting positive mitigation stories to the media and promoting them on our website we can educate the public on how mitigation works. The biggest obstacle to promoting mitigation is that when it works, nothing happens.	By understanding the positive ramifications of mitigation, the public is more likely to support it.	Continuing Added Supporting Agencies

Strategy 1.1.4. Maintain and implement a State Mitigation Plan that fosters innovation, advances public support, and gains long-term commitments for pre-disaster mitigation from the State of Illinois.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.1.4.1. Closely follow FEMA's development of the new rules and regulations for implementing Section 322 of the Disaster Mitigation Act of 2000. **(ongoing)**	FEMA DAE assistance	By following FEMA's guidance the State can develop a DMA2k approved plan. The process of developing a plan strengthens mitigation in the State by forming connections with numerous agencies.	An approved DMA2k plan is required for future mitigation funds. The plan and the process guides the mitigation programs of the State.	Continuing List all updates and revision on the IEMA webpage
Action 1.1.4.2. Using FEMA's revitalized "criteria indicators for State Mitigation Plans," work with the planning committee to develop and maintain a State Mitigation Plan that remains a functional document to guide all Mitigation Section activities. **(annually)**	General Revenue Funds	The mitigation planning process allows for a variety of interested parties to work together to develop the most effective strategies to guide the State's mitigation policies.	A functional plan is necessary to guide State's mitigation activities.	Continuing All portions of the plan reviewed / updated in 2013
Action 1.1.4.3. Review and incorporate the completed CMS state owned/operated facility inventory list into the INHMP. **(ongoing)**	General Revenue Funds	It is important to identify all of the State facilities to be aware of their risk factors.	When the risk factors of State facilities are known, the proper mitigation steps can be taken. CMS is still working on the inventory.	Continuing New action item 1.3.1.7. created to assist with Action

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.1.4.4. When local jurisdiction's mitigation plans are approved, incorporate the hazards, risk assessments and projects into the INHMP. **(ongoing)**	General Revenue Funds	The locals are doing the most detailed analysis of the risks they face.	The more detailed analysis of risks improves the ability of the State to mitigate those risks.	Continuing Local Mitigation Action Items are entered into Access Database to track.
Action 1.1.4.5. When local jurisdiction's mitigation plans are approved, review their mitigation policies, programs and capabilities. **(ongoing)**	General Revenue Funds	When the plans are approved it provides IEMA with the information on what locals are doing to mitigate and how they are doing it.	Best practices can be learned from local governments and shared with others. It can also guide the assistance the State provides.	Continuing
Action 1.1.4.6. Establish criteria to guide the approval of planning and projects. **(IHMPC) (complete)**	General Revenue Funds	By establishing criteria it assists in making logical determinations and minimizes personal preferences.	To determine the priorities for spending is one of the cornerstones of a mitigation strategy.	Continuing

Objective 1.2. Improve organizational efficiency.

Strategy 1.2.1. Coordinate and communicate with other Bureaus within the Agency to support mitigation efforts.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.2.1.1. Jointly develop procedures with the Public Assistance Section to maximize the use of Section 406 Mitigation Funding following a declared disaster event. **(ongoing)**	General Revenue Funds	Infrastructure should be mitigated to prevent future damages, but it is often too costly for 404 projects. 406 funds are a potential large source of funds for mitigation.	It is in the interests of mitigation to protect the State's infrastructure and maximize the dollars spent on mitigation in the State.	Continuing
Action 1.2.1.2. Coordinate with the Public Information Officer (PIO) to publicize success stories. **(annually or when damages were averted)**	General Revenue Funds	The PIO has the skills and resources to publicize success stories.	Success stories build support for mitigation among the public, policy makers, and elected officials.	Continuing
Action 1.2.1.3. Support the IEMA Earthquake Program's efforts to mitigate earthquake damages. **(ongoing)**	General Revenue Funds	It is important to encourage and assist promoting earthquake mitigation.	Earthquakes are potentially the most damaging hazard Illinois faces. There is a definite need to put more resources into mitigating the hazard.	Continuing Local training courses held in 2012.
Action 1.2.1.4. Improve coordination and communication with Regional Coordinators by consulting them in the application process and notifying them of grant approval. **(ongoing)**	General Revenue Funds	Regional Coordinators are links to local governments. Consulting them in the process and notifying them of the results keeps them involved with mitigation.	By involving Regional Coordinators it builds the team that is working on mitigation and increases the chance of mitigation ideas being applied as a solution.	Continuing Mitigation notifications are provided to Regional Coordinators

Strategy 1.2.2. Improve Communication with HMGP, FMA and PDM applicants and subgrantees.
Lead Agency: (IEMA)
Supporting Agency: (IESMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.2.2.1. Make regular phone calls and emails to subgrantees to disseminate policies and provide training. **(ongoing)**	General Revenue Funds	Correct actions come from the people implementing projects being well informed and trained.	If we expect locals to follow the policies we must keep them updated on what they are.	Continuing HMGP Key Consideration form created in 2012
Action 1.2.2.2. Maintain consistency between policies and procedures, and create an e-mail group to allow for routine dissemination of policies and procedures. **(ongoing)**	General Revenue Funds	Disseminating information through email groups is the cheapest most effective method. Everyone is told the same thing and it is in writing for future reference.	If we expect locals to follow the policies we must keep them updated on what they are.	Continuing Added Supporting Agency
Action 1.2.2.3. Maintain the same Project Manager for consistency. **(ongoing)**	No resources required	By maintaining the same project manager it enables IEMA to have a better understanding of the project and assists the local by developing a relationship with the project manager.	Consistency in the guidance of projects minimizes dissatisfaction with the process. Knowledge of projects can take a while and it helps ensure that the correct policies are implemented.	Continuing
Action 1.2.2.4. Maintain a contact log. **(ongoing)**	General Revenue Funds	This serves to document that information was conveyed to the local government.	This helps ensure an informed subgrantee.	Continuing

Strategy 1.2.3. Streamline Grant Management Process and Procedures.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.2.3.1. Maintain a uniform standardized filing system. **(ongoing)**	General Revenue Funds	Filing must occur and by having a standardized system it prevents information from being lost.	Efficient management of mitigation requires that the documents are easily found.	Continuing
Action 1.2.3.2. Assure staff documents all contact, visits, etc. with community in a contact log. **(ongoing)**	General Revenue Funds	This serves to document that information was conveyed to the local government.	This helps ensure an informed subgrantee.	Continuing Electronic Timekeeping Log being utilized
Action 1.2.3.3. A POC group will be set up on the e-mail system to facilitate POC's receiving policies promptly. POC's who do not have e-mail will be set up as a group on the fax system and information faxed to them. **(ongoing)**	General Revenue Funds	Disseminating information through email groups is the cheapest most effective method. Everyone is told the same thing and it is in writing for future reference.	If we expect locals to follow the policies we must keep them updated on what they are.	Continuing
Action 1.2.3.4. Minimize paperwork and reporting requirements where possible. **(ongoing)**	General Revenue Funds	Unnecessary paperwork is a burden, creates dissatisfaction, and takes time away from other areas.	A positive experience in implementing projects improves the image of the mitigation program.	Continuing

Strategy 1.2.4. Improve Management.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.2.4.1. Task assignment-use a weekly task assignment sheet and help staff prioritize assignments. **(ongoing)**	General Revenue Funds	Weekly prioritization of tasks ensures that the priorities get accomplished and limited resources are used correctly.	The mitigation staff has limited resources and decisions must be made on priorities to ensure the most important work is completed.	Continuing
Action 1.2.4.2. Hire additional mitigation staff to assist with mitigation planning and projects. **(ongoing)**	HMGP Management Costs	Mitigation grant funds, projects and plans all have a deadline for completion associated with them. In order to meet these deadlines proper staffing is required.	A properly staffed mitigation section will provide timely and accurate assistance to mitigation projects, plans and grants.	New Applications submitted and obligated by FEMA

Strategy 1.2.5. Ensure Timely Process.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.2.5.1. Complete Local Mitigation Plan reviews within two months. **(ongoing)**	General Revenue Funds	If reviews are not timely it hinders the efforts of locals to make the necessary changes.	Timely review improves satisfaction and prevents the plans from stagnating.	Continuing
Action 1.2.5.2. Have Local Mitigation Project applications ready for submittal within 6 months from the disaster declaration date. **(ongoing)**	General Revenue Funds	If applications are not submitted in a timely manner, potential mitigation projects may be denied.	Timely submission of applications allows for a quicker turn around in approvals for grants.	New

Objective 1.3. Maximize the utilization of best technology

Strategy 1.3.1. Incorporate geographic information system (GIS) as a tool in decision making.
Lead Agency: (IEMA)
Supporting Agency: (CMS),(IDOT),(IDNR/OWR),(ICC),(DCEO),(INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.3.1.1. Continually upgrade statewide spatial data maintained in-house through multiple data sources. **(ongoing)**	General Revenue Funds	Current data improves the use of technology. Technology is only as good as the data put into it.	Using the best data leads to making the best decisions.	Continuing Added Support Agencies
Action 1.3.1.2. Evaluate emerging technologies and upgrade through hardware/software acquisition and training where appropriate and feasible. **(ongoing)**	General Revenue Funds	Improved technologies can assist in risk assessment which enables us to better understand the risk factors.	Upgraded technology improves the ability to assess risks and to maximize the resources of the mitigation section.	Continuing Added Support Agencies
Action 1.3.1.3. Keep GIS staff positions filled with capable personnel. **(ongoing)**	General Revenue Funds	Turnover results in the loss of institutional knowledge and hinders the use of GIS for mitigation purposes.	A well-trained staff can more effectively assist with mitigation programs.	Continuing Added Support Agencies
Action 1.3.1.4. Maintain capability of GIS specialists and technicians through classroom education and distance learning. **(ongoing)**	General Revenue Funds	Continuing education increases the skills of the GIS staff. It is especially important for them to learn how to apply their skills for mitigation purposes.	A well-trained staff can more effectively assist with mitigation programs.	Continuing Added Support Agencies

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.3.1.5. Make spatial data with viewing and mapping capability available to all staff in hazard mitigation section, creating a scaled section-wide geographic information system. **(ongoing)**	General Revenue Funds	The more effectively IEMA can use available data, the more effectively we can implement the programs.	Using the best data leads to making the best decisions.	Continuing Added Support Agencies
Action 1.3.1.6. Training current mitigation staff positions in GIS software and application. **(ongoing)**	General Revenue Funds	GIS data is utilized in many mitigation planning initiatives and projects, having mitigation staff training in GIS, will allow for a more effective exchange.	Properly trained staff will provide the accessibility to more accurate and updated GIS information for mitigation studies and analysis.	New
Action 1.3.1.7. Coordinate with State agencies to develop and maintain a specific agency database with GPS latitude and longitude coordinates to develop an all-encompassing database of state controlled buildings and facilities. **(ongoing)**.	General Revenue Funds Department of Energy Grant Funds	Accurate latitude and longitude coordinates for all state occupied and operated buildings will assist in determining risk to specific hazards	Risk assessments require the best data available to ensure an accurate product is produced.	New
Action 1.3.1.8. Coordinate with the Illinois Commerce Commission and other state agencies to explore grant funding opportunities to develop a comprehensive state facility database. **(Within three years)**	Department of Energy Grant Funds	Having an all-encompassing data base of state facilities will assist in all phases of emergency management.	An in depth database with latitude and longitude of state buildings and facilities will provide for more accurate future risk analysis.	New

Strategy 1.3.2. Cooperate and coordinate with partners at all government levels in planning and use of best technology.
Lead Agency: (IEMA)
Supporting Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.3.2.1. Develop working relationships with other state agencies for mutual assistance in technologies. **(ongoing)**	General Revenue Funds	Other agencies are already gathering information that can be useful to IEMA.	Limited mitigation resources make building partnerships and using existing data essential.	Added Supporting Agency
Action 1.3.2.2. Work with State and federal agencies to ensure all current risk data bases are utilized (i.e., weather studies and rainfall data). **(ongoing)**	General Revenue Funds	Other agencies are already gathering information that can be useful to IEMA. We need to ensure we are using the best data possible.	Limited mitigation resources make building partnerships and using existing data essential. Using the best data leads to making the best decisions.	Continuing Compiled a new database utilizing NCDC and SHELDUS
Action 1.3.2.3. Develop working relationship with federal agencies with interests related to emergency management and hazard mitigation, with technologies from which we can benefit. **(ongoing**)	General Revenue Funds	Other agencies are already gathering information that can be useful to IEMA. We need to ensure we are using the best data possible	Limited mitigation resources make building partnerships and using existing data essential. Using the best data leads to making the best decisions.	Continuing
Action 1.3.2.4. Develop an all-encompassing geodatabase of levees within the State including areas at risk of flooding if they are overtopped or fail. **(ongoing)**	CAP Funds USACE Funds	Provides basis for communicating risk to those protected by levees; supports planning for mitigation and emergency management.	Comprehensive data on the areas protected by levees will provide information to inform agencies and individuals of flood risk and identify possible mitigation actions.	New Funds requested by USACE to develop database

Strategy 1.3.3. Increase the use of best technology in Grants Management.
Lead Agency: (IEMA)
Support Agency: (IDNR), (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.3.3.1. Use GIS for project identification, application development and project implementation. **(ongoing)**	General Revenue Funds	Improved technologies can assist in risk assessment which enables us to better understand the risk factors.	Using the best data leads to making the best decisions.	Added Supporting Agencies
Action 1.3.3.2. Develop a standardized grants management tracking system. **(ongoing)**	EMPG Funds	Proper tracking of grant funds is essential in managing state and federal funds.	Standardized tracking of grant funds will enable more accurate projection of future fund availability in disaster funds.	New IEMA IT is currently developing an internal system for grant tracking

Strategy 1.3.4. Utilize HAZUS MH for risk assessment.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 1.3.4.1. Use HAZUS MH to determine the dollar amount of potential losses for future updates to the INHMP.	General Revenue Funds	HAZUS MH assists in risk assessment which enables us to better understand the risk factors.	The INHMP should use the best data possible. Using the best data leads to making the best decisions.	HAZUS MH analysis completed for flooding risk and incorporated into the plan.
Action 1.3.4.2. Coordinate the earthquake HAZUS MH risk assessments with the IEMA Earthquake Program and continue to coordinate local data collection to include in the INHMP.	General Revenue Funds	HAZUS MH assists in risk assessment which enables us to better understand the risk factors. This information can make the Earthquake Coordinator more effective.	Using the best data leads to making the best decisions. The Earthquake Coordinator is a valuable partner and we should ensure we are working with the same information.	HAZUS MH analysis completed in 2007 for earthquake risk.
Action 1.3.4.3. Encourage and provide training to local jurisdictions to use HAZUS MH for risk assessment. **(ongoing)**	General Revenue Funds	HAZUS MH is a valuable tool and its widespread use should be encouraged. It also provides consistency in the risk assessments.	Local jurisdictions using HAZUS MH provides consistent quality risk assessments.	Continuing: HAZUS analysis results for flooding will be supplied to each individual county.
Action 1.3.4.4. Provide training to IEMA Planning Staff on HAZUS MH **(ongoing)**	General Revenue Funds	HAZUS MH is a valuable tool and its widespread use should be encouraged. It also provides consistency in the risk assessments.	The INHMP should use the best data possible. Using the best data leads to making the best decisions.	Unchanged Limited Staff and Funding

GOAL 2. Build and support local capacity and commitment to continuously become less vulnerable to natural hazards.

Objective 2.1. Increase awareness and knowledge of hazard mitigation principles and practice among local public officials.

Strategy 2.1.1. Conduct mitigation presentations for local public officials.
Lead Agency: (IEMA)
Supporting Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.1.1.1. Develop and maintain a variety of adaptable mitigation Power Point presentations for local officials upon request. **(ongoing)**	General Revenue Funds	Previously developed presentations allow for a minimum of preparation time for speaking engagements and helps ensure everything is covered.	Prepared presentations optimize the opportunity to educate officials.	Added Supporting Agencies
Action 2.1.1.2. Contact associations for zoning officials to present mitigation ideas to their membership. **(annually)**	General Revenue Funds	Zoning officials are an important ally in mitigation and we need to form a better relationship with them.	This builds partnerships and provides support for the mission of zoning officials.	Continuing
Action 2.1.1.3. Contact township and County Highway associations to present mitigation ideas to their membership.(**annually)**	General Revenue Funds	Township and highway officials are an important ally in mitigation and we need to form a better relationship with them.	This builds partnerships and provides support for the mission of highway officials.	New
Action 2.1.1.4. Include information regarding mitigation activities for natural hazards on the ReadyIllinois.gov website.**(ongoing)**	General Revenue Funds	ReadyIllinois.gov is a well know resource for citizens to reference for disaster assistance.	Providing mitigation activities and ideas on a readily accessible website will educate a larger population.	New

Strategy 2.1.2. Conduct training courses for local public officials.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.1.2.1. Conduct interactive "Mitigation Planning Workshops" and mitigation training classes. **(ongoing)**	General Revenue Funds	Locals must be educated on why and how to do mitigation plans.	Local mitigation plans will form the foundation for future state plans.	"Camtasia Studio 8" has been purchased to develop online training sessions and tutorials.
Action 2.1.2.2. Educate IEMA Regional Coordinators and local coordinators in coordination with the Training Officer. **(ongoing)**	General Revenue Funds	Regional Coordinators are links to local governments. We need to educate them on all of the mitigation tools available.	By involving Regional Coordinators it builds the team that is working on mitigation and increases the chance of mitigation ideas being applied as a solution.	Mitigation staff is attending IEMA Regional meetings to discuss mitigation activities.

Strategy 2.1.3. Provide information on mitigation for publications with a target audience of public officials (Illinois Issues, IL Municipal Review).

Lead Agency: (IEMA)

Supporting Agency: (IDNR),(DCEO),(ARC),(CDB),(IDOT),(IESMA),(IDPH), (IEPA),(CMS),(DOI) &(DHS)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.1.3.1. Work with State Agency PIO's on writing and distributing articles. **(ongoing)**	General Revenue Funds	These magazines provide opportunities to do a more in-depth analysis of mitigation and target people interested in public policy.	By understanding the positive ramifications of mitigation, public officials are more likely to support it.	Continuing Updated to include all State Agency PIO's
Action 2.1.3.2. Explore using 5% funds to pay for a professional writer to create articles promoting mitigation. **(ongoing)**	HMGP 5% funds	The PIO might not have the time to commit to in-depth analysis. A professional writer can provide a quality product and potentially increase the chance of getting it published.	By understanding the positive ramifications of mitigation, the public and public officials are more likely to support it.	Continuing
Action 2.1.3.3. Create publications to distribute regarding agency coordinated or funded mitigation projects. **(ongoing)**	General Revenue Funds	Publication of agency specific mitigation actions or agency funded projects will promote local mitigation efforts.	By understanding the positive ramifications of mitigation, the public and public officials are more likely to support it.	New
Action 2.1.3.4. Distribute hazard mitigation material to insurance companies, agents, and consumers to assist in the development, establishment and implementing of statewide mitigation programs.**(ongoing)**	General Revenue Funds	The DOI acts as the regulator agency for insurance and carriers. The DOI encourages loss prevention and enhancing through education.	Engaging insurance companies and carriers will help educate the public regarding private mitigation actions.	New

Strategy 2.1.4. Provide jurisdictions with the necessary resources to evaluate their community building codes highlighting the impact of safe buildings on local residents.
Lead Agency: (CDB)
Support Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.1.4.1. Publication of the "Directory of Illinois Building Related Requirements." In electronic format via the internet **(ongoing)**	General Revenue Funds	Educates individuals and contractors on building codes in force in their jurisdiction.	Ensures that construction complies with the existing laws and regulations.	Completed Continuing with maintenance of directory
Action 2.1.4.2. Maintain a website to provide informational resources regarding building codes administered in Illinois among the more than 25 state agencies. **(ongoing)**	General Revenue Funds	Educates individuals and contractors on building codes in force in their jurisdiction.	Ensures that construction complies with the existing laws and regulations.	Completed Continuing with maintenance of site
Action 2.1.4.3. Explore possibilities for the creation of a mobile support team and legislation to provide technical engineering and architectural staff capable of assessing the structural safety of facilities for disaster resilience. **(ongoing)**	General Revenue Funds	Providing technical assessments of facilities to determine disaster resilience and identify potential risks to existing facilities, while providing legal authority and limiting liability to mobile support team.	Pre-Disaster assessment of facilities will determine disaster resilience and identify potential risks to existing facilities.	New
Action 2.1.4.4. Provide instructional and training opportunities for local code officials to enable them to conduct pre-disaster assessments of structural safety of facilities for disaster resilience. **(ongoing)**	General Revenue Funds	Providing training to allow local officials to conduct assessments of their own facilities to determine disaster resilience and identify potential risks to existing facilities.	Pre-Disaster assessment of facilities will determine disaster resilience and identify potential risks to existing facilities.	New

Objective 2.2. Provide direct technical assistance to local public officials and help communities obtain funding for mitigation planning and project activities.

Strategy 2.2.1. Provide information on available mitigation funds to jurisdictions.
Lead Agency: (IEMA)
Supporting Agency: (IDNR) & (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.2.1.1. Improve the IEMA mitigation website to provide the latest mitigation information on funding sources and planning instructions to the local jurisdictions. **(ongoing)**	General Revenue Funds	This is the cheapest most efficient method of making information available to all interested jurisdictions.	It provides information to local jurisdictions.	IEMA website is continually updated. A grant application toolbox was established in 2012.
Action 2.2.1.2. Following any major disaster, send a letter to the local jurisdictions explaining the mitigation assistance that is available. **(ongoing)**	General Revenue Funds	This targets the affected jurisdictions to let them know about potential mitigation assistance.	This educates the jurisdictions with potentially the highest level of interest in mitigation about available programs.	Continuing
Action 2.2.1.3. Provide presentations to local jurisdictions explaining all types of mitigation funding sources that are or might become available. **(ongoing)**	General Revenue Funds	Mitigation is not an area familiar to many people. Local jurisdictions might not be aware of the potential funds for projects that would serve their interests.	This educates jurisdictions on what tools might be available to them to minimize the risks their jurisdiction faces.	Continuing Coordinating with RiskMap representatives to present at Risk MAP Discovery and Resilience meetings.

Strategy 2.2.2. Publicize and provide risk assessment products and planning services to assist local officials throughout the local mitigation planning process.
Lead Agency: (IEMA)
Supporting Agency: (IESMA),(ISWS),(ISGS), (NWS) & (IDPH)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.2.2.1. Distribute FEMA's mitigation planning documents (State and Local Mitigation Planning how-to guides) to interested jurisdictions. **(ongoing)**	General Revenue Funds	Following FEMA guidance increases the chance of approval.	Local mitigation plans will form the foundation for future State Plans.	Added Supporting Agencies
Action 2.2.2.2. Distribute IEMA's forms (Illinois Hazard Rating Process, Local Risk Assessment and Local Mitigation Projects) to any jurisdiction starting a mitigation plan. **(ongoing)**	General Revenue Funds	In order to integrate local plans into the INHMP it is important that they follow the same guidance.	Local mitigation plans will form the foundation for future State Plans.	Continuing
Action 2.2.2.3. Create an all-encompassing source of past natural hazard occurrences including impact data in Illinois for future planning efforts. **(annually)**	General Revenue Funds	A singular source of past natural hazard occurrences in Illinois will provide for a more in-depth and through risk assessment process for local jurisdictions.	A thorough and in-depth examination of past occurrences including impact data of all natural hazards will produce a more accurate risk assessment.	New
Action 2.2.2.4. Conduct public health hazard risk assessments at all local health departments throughout the state. **(ongoing)**	Public Health Emergency Preparedness Grant	Public Health Departments were required to conduct a risk assessment by the end of 2012.	Conducting more in depth risk assessments at the local level will provide better insight to a wider range of hazards.	New Complete will be added as Appendix to 2013 HMP

Objective 2.3. Encourage communities to develop, adopt, and implement local hazard mitigation plans.

Strategy 2.3.1. Continuously demonstrate the importance of pre-disaster mitigation planning to local public officials and promote the availability of PreDisaster Mitigation (PDM) resources.
Lead Agency: (IEMA)
Supporting Agency: (IESMA) & (MCSC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.3.1.1. Send updated information on the PDM initiative to all eligible municipal and county managers, along with local planners and floodplain administrators. **(annually)**	General Revenue Funds	Local jurisdictions need to be made aware of this program. PDM is a competitive program. It is in the State's interest to attract as many applications as possible.	Any projects approved provide funds for mitigation activities in the State.	Planning Toolbox including templates for planning applications and deployment of plans created in 2012.
Action 2.3.1.2. Publicize Section 322 of the Disaster Mitigation Act of 2000 to local public officials in all outreach activities. **(ongoing)**	General Revenue Funds	Local public officials need to be aware of the DMA2k planning requirements to encourage them to begin work on a plan.	The local plans serve as the foundation for the State plan and make the locals eligible for mitigation funds.	Added Supporting Agencies
Action 2.3.1.3. Make HMGP planning grant funds available to Non-NFIP compliant counties for the development of a natural hazard mitigation plan.**(ongoing)**	Hazard Mitigation Grant Program	The availability to obtain a planning grant to develop a HMP is important for all counties in order to identify their associated risks and items to lessen their risk.	This type of planning effort will enable counties to seek assistance in the development of a HMP, which could identify their need or benefit of participating in the NFIP.	New

Objective 2.4. Improve compliance with State floodplain regulations and encourage participation in the National Flood Insurance Program (NFIP).

Strategy 2.4.1. Promote NFIP compliance as a prerequisite for all communities considering hazard mitigation projects.
Lead Agency: (IDNR/OWR)
Supporting Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.1.1. Ensure that Mitigation section staff routinely identify and communicate potential compliance issues. **(ongoing)**	General Revenue Funds	The mitigation staff travels to many flood prone locations. This provides the opportunity to refer potential violations to IDNR/OWR as we work together to ensure jurisdictions are compliant with NFIP regulations.	Preventing structures from being built in harm's way is the first step in mitigation.	Continuing
Action 2.4.1.2. Ensure communities not in good standing with the NFIP understand that they will remain ineligible for any mitigation funding. **(ongoing)**	No resources required	Requiring good standing in the NFIP for mitigation funds serves as an incentive for jurisdictions to come into compliance.	Preventing structures from being built in harm's way is the first step in mitigation.	Continuing
Action 2.4.1.3 Continue to promote Flood Insurance and the NFIP Program as the cornerstone of mitigation **(ongoing)**	No resources required	The NFIP program and flood insurance policies provide tools for homeowners and communities to mitigate their flood risks.	Preventing structures from being built in harm's way is the first step in mitigation. This educates jurisdictions on tools available to minimize the flood risk.	Continuing

Strategy 2.4.2. Encourage communities to adopt strong local floodplain regulations to reduce future flood losses.
Lead Agency: (IDNR/OWR)
Supporting Agency: (IEMA),(IDPH) & (IEPA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.2.1. Work with IDNR/OWR to identify flood prone areas and incorporated municipalities where stronger regulations would be appropriate. **(IEMA) (ongoing)**	General Revenue Funds	The mitigation staff travels to many flood prone locations. This provides the opportunity to identify areas where stronger floodplain regulations can serve as an effective tool.	Preventing structures from being built in harm's way is the first step in mitigation.	Continuing
Action 2.4.2.2. Maintain awareness of new incorporations and encourage participation in the NFIP. **(IDNR/OWR) (ongoing)**	General Revenue Funds	Jurisdictions complying with the NFIP rules prevent structures from being built in harm's way.	Preventing structures from being built in harm's way is the first step in mitigation.	Continuing
Action 2.4.2.3. Continue to work with IDNR/OWR to conduct floodplain management and flood mitigation workshops. **(IEMA) (ongoing)**	General Revenue Funds	This is a long standing partnership that benefits both partners by educating the locals on flood mitigation.	Preventing structures from being built in harm's way is the first step in mitigation. This educates jurisdictions on tools available to minimize the flood risk.	Continuing
Action 2.4.2.3. Provide public education and continued enforcement of septic and sewer regulations to locations in floodplains **(ongoing)**	General Revenue Funds	Continued education and enforcement of current regulations will help to ensure continued compliance.	Public knowledge and compliance regarding septic and sewer in the flood plain will mitigation future issues.	New
Action 2.4.2.4. Identify public water supply sources repeatedly affected by flooding and encourage mitigation efforts to limit losses associated with water quality. **(within three years)**	General Revenue Funds	Water supply contamination is a continual risk during flooding events.	Identification of continually flood threatened water supply sources will assist in mitigating this risk.	New

Strategy 2.4.3. Encourage participation in Community Rating System (CRS) and improve ratings of communities.
Lead Agency: (IDNR/OWR)
Supporting Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.3.1. Identify potential CRS communities and notify IDNR/OWR to encourage enrollment. **(ongoing)**	General Revenue Funds	CRS communities go beyond the minimum standards required by the NFIP. Many of these activities are mitigation based.	CRS is a mitigation tool that rewards mitigation activities.	Continuing

Strategy 2.4.4. Use new technologies such as GIS with high resolution, current topography, lidar, orthophotography and digital floodplain mapping (DFIRM) as a tool to increase flood hazard awareness and risk reduction

Lead Agency: (IDNR/OWR)

Support Agency: (ISWS) & (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.4.1. Continue to develop digital Countywide floodplain mapping for the entire State. **(ongoing)**	CAP, CTP, and MMMS funds	Digital maps will improve the quality and usability of flood maps. Illinois is the only state that is doing this without consultants.	Using the best data leads to making the best decisions and digital maps will greatly increase the ease of use with GIS and HAZUS.	Continuing
Action 2.4.4.2. Use DFIRM data to identify newly mapped flood hazard areas. **(annually)**	CAP, CTP, and MMMS funds	Improved technologies can assist in risk assessment which enables us to better understand the risk factors.	Using the best data leads to making the best decisions.	Continuing
Action 2.4.4.3. Notify communities with new flood risks and encourage them to adopt local floodplain regulations and seek mitigation alternatives. **(ongoing)**	CAP, CTP, and MMMS funds	NFIP regulations are the first step in mitigating flooding.	Mitigation begins prior to construction with appropriate land use.	Continuing
Action 2.4.4.4. Encourage and assist communities to develop GIS parcel maps and DFIRMs to identify at-risk properties in flood hazard areas. **(ongoing)**	CAP, CTP, and MMMS funds	Improved technologies can assist in risk assessment which enables us to better understand the risk factors.	Using the best data leads to making the best decisions.	Continuing
Action 2.4.4.5. Work with communities with identified flood risks to establish flood gauging and early warning systems. **(ongoing)**	CAP, CTP, and MMMS funds	Improved data can assist in risk assessment which enables a better response.	Using the best data leads to making the best decisions.	Continuing
Action 2.4.4.6. Incorporate the RiskMAP program into mitigation project and planning efforts.**(ongoing)**	RiskMAP Funding	The use of RiskMAP's technology and local knowledge will provide for increased knowledge and accountability regarding mitigation efforts at the local level.	The information provided through the RiskMAP program will highlight specific hazard areas within a jurisdiction, prompting mitigation efforts to limit or eliminate the impact.	New

Strategy 2.4.5. Support the Illinois Association for Floodplain and Stormwater Managers (IAFSM) programs, including education and communication.
Lead Agency: (IDNR/OWR)
Supporting Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.5.1. Support IAFSM administration of the Certified Floodplain Manager (CFM) program. **(IDNR/OWR) (ongoing)**	General Revenue Funds	This is a method of professionalizing floodplain management.	Professional development improves the execution of floodplain management.	Continuing
Action 2.4.5.2. Support and submit information to the IAFSM newsletter for communication. **(ongoing)**	General Revenue Funds	The IAFSM newsletter reaches a target audience of people interested in floodplain issues. This is a free way to educate people that execute policies.	This provides information on mitigation to interested parties.	Continuing
Action 2.4.5.3. Coordinate education activities with IAFSM. **(ongoing)**	General Revenue Funds	IAFSM is a valuable partner for reaching a target audience interested in floodplain issues.	This provides information on mitigation to interested parties.	Continuing
Action 2.4.5.4. Support annual IAFSM conference. **(annually)**	General Revenue Funds	IAFSM is a valuable partner for reaching a target audience interested in floodplain issues. The conference provides an opportunity to convey best practices and network.	This provides information on mitigation to interested parties.	Continuing
Action 2.4.5.5. Ensure IAFSM Board membership participation in the States Hazard Mitigation Planning Meetings.**(annually)**	No Funds Required	IAFSM representation is required at the State Hazard Mitigation Plan meetings to ensure consistency with planning efforts.	IAFSM board membership representation will ensure that no duplication of services or planning is taking place.	New

Strategy 2.4.6. Ensure that all State funded or State promoted activities are consistent with sound floodplain management principles.
Lead Agency: (IDNR/OWR)
Support Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.6.1. Encourage compliance with the new Executive Order on Floodplain Management (EO4). **(IDNR/OWR) (ongoing)**	General Revenue Funds /CAP	The new Executive Order reflects the current floodplain laws, but is only worthwhile if it is enforced.	As an Executive Order it provides a law that all the State agencies must follow on floodplain management.	Continuing
Action 2.4.6.2. Work with other state agencies to identify flood risks and develop a method that minimizes potential flood losses. **(ongoing)**	General Revenue Funds	EO4 has prohibited State construction in the floodplain for 25 years. There might be some existing State structures in the floodplain. We must identify them and then decide the appropriate mitigation action.	State facilities serve the public; therefore, to ensure continuity of service we need to minimize the risks from hazards.	Continuing
Action 2.4.6.3. Develop Executive Order workshops for state agencies. **(ongoing)**	General Revenue Funds/CAP	Workshops will provide state agencies in-depth information regarding the requirements in the Executive Order.	Understanding of the Executive Order will facilitate compliance by participating state agencies.	New Complete
Action 2.4.6.4 Create Executive Order instructional book for guidance. **(ongoing)**	General Revenue Funds/CAP	A reference guide will provide proper instruction on the Executive Order.	A reference guide will provide the appropriate requirements to compile with the Executive Order.	New Complete

Strategy 2.4.7. Assure minimum flood protection standards are met and promote higher floodplain management standards in all jurisdictions.
Lead Agency: (IDNR/OWR)
Support Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.7.1. Update and distribute model Flood Damage Prevention Ordinance. **(IDNR/OWR) (ongoing)**	CAP funds	This assists jurisdictions in utilizing the best ordinance possible.	Mitigation begins prior to construction with appropriate land use.	Continuing
Action 2.4.7.2. Develop and maintain community floodplain management information database. **(IDNR/OWR) (ongoing)**	CAP funds	This assists the State in identifying jurisdictions that need assistance in managing the floodplain.	Mitigation begins prior to construction with appropriate land use.	Continuing
Action 2.4.7.3 Create a database of all levees in the State. **(ongoing)**	General Revenue Funds	The State is currently developing this database to provide a better understanding of what areas are protected by levees in the State.	Identifying levees improves the State's understanding of flood control and potential flood damage.	Complete
Action 2.4.7.4. Identify areas of residual risk from flooding **(ongoing)**	General Revenue Funds	Areas behind levees and dams give people a false sense of security. Many are not identified on flood maps.	Citizens located in areas of residual risk may be unaware of their real risk and not take proper precautions or mitigation steps.	Continuing
Action 2.4.7.5. Develop state incentives for minimum compliance and for higher floodplain management standards. **(ongoing)**	CAP funds	The model ordinance provides a minimum standard; mitigation can be furthered by adopting more stringent regulations.	Incentives would cause greater compliance by giving locals a reason to make mitigation a higher priority.	Continuing

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.4.7.6. Develop and conduct workshops for local officials regarding flood protection standards. **(ongoing)**	CAP funds	Workshops will provide local officials in-depth information regarding minimum flood protection standards.	Understanding flood protection standards will facility compliance by participating local jurisdictions.	New
Action 2.4.7.7. Conduct community audits to ensure compliance with minimum flood standards. **(ongoing)**	CAP Funds	Audits ensure that proper standards are being met regarding the flood standards.	Jurisdictions will attempt to remain compliant with current flood standards if audits will be complete to review compliance.	New

Objective 2.5. To assist jurisdictions in developing mitigation projects and identifying funding for cost-beneficial mitigation projects.

Strategy 2.5.1. Identify and assess repetitive loss properties for possible projects.
Lead Agency: (IDNR)
Support Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.5.1.1. Verify repetitive loss database. **(ongoing)**	CAP funds potentially HMGP funds	The repetitive loss database has errors. We need to work with correct data.	Acquiring repetitive loss properties is one of the State's highest priorities.	Complete
Action 2.5.1.2. Collect digital pictures of rep loss properties. **(ongoing)**	CAP funds potentially HMGP funds	This is part of the process of building a data base on repetitive loss properties. They can also be used for future success stories.	Acquiring repetitive loss properties is one of the State's highest priorities.	Complete
Action 2.5.1.3. Gather GPS latitude/longitude coordinates and first floor elevations of repetitive loss properties. **(ongoing)**	CAP funds potentially HMGP funds	This is the most important part of the process of building a data base on repetitive loss properties. They can be used for B/C's and success stories.	Acquiring repetitive loss properties is one of the State's highest priorities. The best data leads to the best decisions.	Complete
Action 2.5.1.4. Take field inspection comments on repetitive loss properties. **(ongoing)**	CAP funds potentially HMGP funds	This is part of the process of building a data base on repetitive loss properties. They can also be used for future success stories.	Acquiring repetitive loss properties is one of the State's highest priorities.	Complete

Strategy 2.5.2. When available, allocate federal and state grant funding to local governments (or other eligible recipient) for the purposes of developing local mitigation plans.
Lead Agency: (IEMA)
Supporting Agency: (IDNR) & (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.5.2.1. Provide federal HMGP, FMA and PDM Planning Grants to communities willing to provide a 25% local match, and based upon established criteria. **(HMGP/ongoing FMA and PDM) (annually)**	HMGP, FMA, PDM	Many jurisdictions do not have the resources available to develop a plan. The State wants as many local jurisdictions as possible to be covered by DMA2k mitigation plans.	The local plans serve as the foundation for the INHMP and make the locals eligible for mitigation funds.	Continuing
Action 2.5.2.2. Coordinate with other State and Federal Agencies to assist communities with obtaining assistance for the 25% local match, when available and meets regulations. **(ongoing)**	State and Federal Grant Funds	Many jurisdictions do not have the local resources available to provide a 25% local cost match.	If cost match assistance is available, local resources will not be over taxed, resulting in more mitigation actions.	New
Action 2.5.2.3. Facilitate partnerships between benevolent/faith based groups and local jurisdictions to provide assistance for 25% local match, when available and meets regulations. **(ongoing)**	General Revenue Funds	Many benevolent/faith based groups provide funding opportunities for community assistance.	Assisting local jurisdictions become engaged with these organizations may provide funding assistance, not previously explored.	New

Strategy 2.5.3. When available, allocate federal and state grant funding to local governments (or other eligible recipient) for the purposes of implementing eligible hazard mitigation projects using adopted plans as guides.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.5.3.1. Provide federal Flood Mitigation Assistance (FMA), Pre-Disaster Mitigation (PDM), Repetitive Flood Claims (RFC) and Severe Repetitive Loss (SRL) Project Grants to communities willing to make a 25% local match and with an adopted and federally approved local mitigation plan, and based upon criteria established through a competitive grant cycle. **(annually)**	FMA, PDM, RFC, SRL	The State wants to maximize the Federal dollars available to assist local jurisdictions in implementing hazard mitigation projects. Very few jurisdictions have the funds to finance mitigation projects on their own.	The highest priority mitigation projects for the State are the acquisition of substantially damaged structures and repetitive loss properties. These are expensive projects and Federal funds greatly expand the amount of work that can be accomplished.	Continuing
Action 2.5.3.2. Provide federal Hazard Mitigation Grant Program (HMGP) Project Grants to communities, who are completing within one year an adopted and federally approved local mitigation plan or currently have such an existing plan, based upon criteria established through a competitive grant cycle. **(In the event of a Federal Disaster)**	HMGP	The State wants to maximize the Federal dollars available to assist local jurisdictions in implementing hazard mitigation projects. Very few jurisdictions have the funds to finance mitigation projects on their own.	The highest priority mitigation projects for the State are the acquisition of substantially damaged structures and repetitive loss properties. These are expensive projects and Federal funds greatly expand the amount of work that can be accomplished.	Continuing

Objective 2.6. Continuously demonstrate and capitalize upon the connection between hazard mitigation and sustainable development.

Strategy 2.6.1. Actively participate in all State-level sustainable development initiatives.
Lead Agency: (MCSC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.6.1.1. Establish two-way links between the Mitigation Section's website and those of other State agencies or other groups that promote sustainable development. **(ongoing)**	General Revenue Funds	This is a free way to promote the ideas of sustainable development, which overlap with the ideas of mitigation.	This distributes mitigation ideas and reinforces them with the concept of sustainable development.	Continuing

Strategy 2.6.2. Coordinate with non-profit organizations that are responsible for promoting and/or implementing sustainable development or "smart growth" initiatives.
Lead Agency: (MCSC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.6.2.1. Identify all non-profit organizations that are responsible for promoting and/or implementing sustainable development or "smart growth" initiatives. **(ongoing)**	General Revenue Funds	The mitigation staff is always looking for other entities that share our mission to develop partnerships.	Limited mitigation resources make building partnerships essential.	Continuing
Action 2.6.2.2. Identify specific opportunities for future collaboration and/or partnerships and develop methods to ensure continued coordination. **(ongoing)**	General Revenue Funds	The potential partnerships can be strengthened by sharing projects that serve our common interests.	Limited mitigation resources make building partnerships essential.	Continuing

Strategy 2.6.3. Ensure that hazard mitigation is recognized in any state-level programs or proposed legislation packages that target "smart growth" or sustainable development practices.
Lead Agency: (MCSC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.6.3.1. Work to amend the "smart growth" legislation to include hazard mitigation. **(ongoing)**	General Revenue Funds	There is "smart growth" legislation that has been approved but that did not include mitigation as a factor.	Inclusion would help institutionalize mitigation as a factor in smart growth.	Continuing

Strategy 2.6.4. Work in coordination with other organizations to acquire and connect hazard-prone or environmentally sensitive lands throughout the State.
Lead Agency: (IDNR/OWR)
Supporting Agency: (MCSC),(IEPA),(IDOT) & (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 2.6.4.1. Work in developing and maintaining a database on all protected lands, identifying possible partners in the acquisition and maintenance of hazard prone lands contiguous to protected lands. **(MCSC) (within three years)**	General Revenue Funds	Partnerships can be developed that serve common interests. Identifying the protected lands will help to identify organizations with common interests and put acquired properties to the best use.	The acquisition of substantially damaged and repetitive loss properties is a State priority. The State is always looking for organizations that can contribute matching funds and potentially maintain acquired properties. Assistance in maintenance makes projects more attractive to locals.	Added Supporting Agencies
Action 2.6.4.2. Use IDNR/OWR Flood Mitigation Assistance Program funds to acquire flood prone property.**(IDNR/OWR) (ongoing)**	Illinois Flood Mitigation Program	The State allocates funds to acquire flood prone properties. These funds are frequently used to provide the local match.	The acquisition of substantially damaged and repetitive loss properties is a State priority. Many jurisdictions would be unable to participate without using these funds for matching funds.	Continuing

Objective 2.7. Improve the disaster resistance of buildings, structures, and infrastructure whether new construction, expansion or renovation.

Strategy 2.7.1. Utilize disaster related impact and response information, to determine potential mitigation project locations.
Lead Agency: IEMA
Supporting Agency: (IDOT),(IDOC),(IDNR) & (ARC)

Actions	Projected Resources	Rational for Action	How Action Contribute to Mitigation Strategy	Update Status (2013)
Action 2.7.1.1. Use Public Assistance costs to identify locations which experience continual infrastructural damage. **(annually)**	General Revenue Funds	Identifying locations within the State that continually experience infrastructural damage will assist in finding possible mitigation projects.	Mitigating locations that continually experience infrastructural damage will lessen the amount of public assistance funding required.	New
Action 2.7.1.2. Provide hazard mitigation presentations regarding application process and grant funding requirements for local officials directly following a disaster. **(ongoing)**	General Revenue Funds	Providing hazard mitigation support directly following a disaster will develop increased interested and support from the local jurisdiction.	Directly following a disaster, officials will be more likely and eager to conduct mitigation actions in their jurisdiction to limit the impact of future disasters.	New

Strategy 2.7.2. Develop partnerships with private and public sector organizations to promote and implement mitigation planning efforts and improvement of disaster resistance of buildings.

Lead Agency: IEMA
Supporting Agency: (CDB),(ICC),(ISBE),(IDHS), (DCEO) & (IHPA)

Actions	Projected Resources	Rational for Action	How Action Contribute to Mitigation Strategy	Update Status (2013)
Action 2.7.2.1. Involve the Illinois Electrical Cooperatives Association and Municipal Electric Cooperative in mitigation planning efforts and studies. **(within three years)**	General Revenue Funds	Electrical Cooperatives in Illinois constitute a large portion of Public Assistance funds claimed.	Assisting electrical cooperatives in identifying potential hazards and possible solutions could help mitigate future losses.	New
Action 2.7.2.2. Engage private sector business to promote disaster resistant building and retro fitting of existing buildings in Illinois. **(ongoing)**	Private Sector Funds	Private sector business provides many vital services to the citizens of Illinois.	Obtaining buy in from private sector businesses could ensure vital services remain functional following a disaster.	New
Action 2.7.2.3. Coordinate with Non-profit groups that provide services of a governmental nature, to address mitigation efforts with in their organization. **(ongoing)**	General Revenue Funds	Non-profit groups provide vital services to Illinois and constitute an additional portion of Public Assistance claims.	Obtaining buy in from private non-profit groups could ensure vital services remain functional following a disaster.	New
Action 2.7.2.4. Encourage higher education institutions to complete campus specific mitigation plans and risk assessments. **(ongoing)**	General Revenue Funds	Higher education institutions have a number of buildings on their campuses that house a number of students.	These institutions incorporate a large population of students. Proper planning is necessary to mitigation potential hazards.	New
Action 2.7.2.5. Encourage private or parochial schools to complete campus specific mitigation plans and risk assessments. **(ongoing)**	General Revenue Funds	Private or parochial schools have the same risk to hazards as the public counter parts.	Proper planning and risk assessment knowledge is necessary to mitigation hazards	New

Actions	Projected Resources	Rational for Action	How Action Contribute to Mitigation Strategy	Update Status (2013)
Action 2.7.2.6. Attempt to incorporate Code Plus construction into state facility site construction of new or existing structures. **(ongoing)**	General Funds HMGP Funds	New construction or renovation projects of state facilities provide for a good opportunity to improve the resiliency of the structure.	Code Plus construction on state facilities will assist in mitigating future loss of life and property.	New
Action 2.7.2.7. Attempt to incorporate Code Plus construction into future historic facility site construction of new or existing structures. **(ongoing)**	General Funds HMGP Funds	New construction or renovation projects of historic sites provide for a good opportunity to improve the resiliency of the structure.	Code Plus construction on historic sites will assist in mitigating future loss of life and property.	New
Action 2.7.2.8. Attempt to incorporate Code Plus construction into future school facility site construction of new or existing structures. **(ongoing)**	General Funds HMGP Funds	New construction or renovation projects of public schools sites provide for a good opportunity to improve the resiliency of the structure.	Code Plus construction on public school sites will assist in mitigating future loss of life and property.	New

Strategy 2.7.3. Continue to evaluation mitigation measures and projects for state agencies and facilities.

Lead Agency: (IEMA)
Supporting Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contribute to Mitigation Strategy	Update Status (2013)
Action 2.7.3.1. Review the risk assessment to determine potential mitigation projects for state facilities. **(annually)**	General Revenue	Identifying mitigation projects for state facilities will decrease the impact of natural disasters on the state.	Lower the impact of natural disasters on state facilities and agencies.	New
Action 2.7.3.2. Develop a prioritized mitigation project list for state facilities, focusing on critical facilities. **(annually)**	General Revenue	A prioritized mitigation project list will assist with identifying projects when funding becomes available.	A list will provide a continuing focus on state mitigation projects.	New
Action 2.7.3.3. Utilize past disaster intelligence information to identify possible mitigation projects for state critical and essential facilities. **(annually)**	General Revenue	Identifying past state facilities that have been affected by natural hazards will assist with identifying mitigation projects to limit future impact.	Lower the impact of natural disasters on state facilities and agencies.	New

GOAL 3. Improve coordination and communication with other relevant entities.

Objective 3.1. Establish and maintain lasting partnerships.

Strategy 3.1.1. Develop a partnership and coordinate mitigation ideas and policies with IMAG and its subcommittee.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2103)
Action 3.1.1.1. Plan and host an annual IMAG meeting. **(annually)**	General Revenue Funds	An annual meeting keeps agencies with a peripheral interest in mitigation involved.	Mitigation needs to be reinforced as a tool available to other State agencies. Limited mitigation resources make building partnerships essential.	Continuing
Action 3.1.1.2. Participate with and use as a resource the Central United States Earthquake Consortium (CUSEC), the Federal Alliance Safe Housing (FLASH), and Institute of Building and Home Safety (IBHS). **(ongoing)**	General Revenue Funds	These are organizations with a mission of mitigating hazards. We can use their expertise to further our mission of promoting mitigation.	Limited mitigation resources make building partnerships essential.	Continuing

Strategy 3.1.2. Distribute Illinois publications to State Hazard Mitigation Officers and State Emergency Management Directors.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.1.2.1. IEMA mitigation staff will share new publications with others. **(ongoing)**	General Revenue Funds	The states work together to further mitigation. We share our publications with them and they share their publications with us.	Limited mitigation resources make building partnerships essential.	Continuing

Objective 3.2. Streamline policies to eliminate conflicts and duplication of effort.

Strategy 3.2.1. Develop knowledge of other State programs.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.2.1.1. Continue with IMAG and MCSC. **(ongoing)**	General Revenue Funds	IMAG and IMAG-SC provide opportunities for representatives of State agencies to coordinate efforts and maximize resources.	Limited mitigation resources make building partnerships essential.	Continuing Continue with individual agency meetings regarding mitigation efforts to focus on agency specific programs

Strategy 3.2.2. Coordinate efforts with other agencies to ensure National Environmental Policy Act (NEPA) compliance.
Lead Agency: (IEMA)
Supporting Agency: (IEPA) & (IDHP)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.2.2.1. Prior to submission of application to FEMA, advising letters will be sent to the consulting agencies. **(ongoing)**	General Revenue Funds	Letters advising consulting agencies on potential projects is the first step in the required NEPA process.	NEPA compliance is a prerequisite for FEMA approval and the process produces better projects.	Continuing Added Supporting Agencies
Action 3.2.2.2. All of the consulting agencies will be called to review all active projects to ensure that they are still in compliance. **(annually)**	General Revenue Funds	FEMA has advised us that the consulting agencies need to be consulted once a year to ensure projects remain in compliance.	NEPA compliance is a prerequisite for FEMA approval and the process produces better projects.	Continuing Added Supporting Agencies

Objective 3.3. Incorporate hazard mitigation into the activities of other organizations.

Strategy 3.3.1. Educate organizations on the theory and practice of hazard mitigation and help them to identify how mitigation can become incorporated into their own routine functions or activities.
Lead Agency: (IEMA)
Support Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.3.1.1. Provide mitigation programs for interested groups. **(ongoing)**	General Revenue Funds ARC funds HMGP project funds	Each Red Cross chapter has a mitigation requirement. HMGP funds are being provided to the Red Cross for disaster resistant construction outreach.	Limited mitigation resources make building partnerships essential. This educates the public on tools available to them to minimize the risks to which they are exposed.	Completed
Action 3.3.1.2. Survey state facilities to determine the presence of a NOAA weather alert radio and severe weather response plans. Provide information about NOAA radios and seek funding sources to obtain weather radios for facilities lacking them. **(within three years)**	HMGP Funding	Weather radios area cost-effective ways of alerting facilities of dangerous weather conditions.	Response plans and early dangerous weather alerts will safeguard state employees working in these facilities.	New
Action 3.3.1.3. Develop an Economic Recovery Framework to help businesses recover following a disaster. **(ongoing)**	CDBG Funding	An increased understanding of how significantly job loss and business failure impacts community recovery.	Increasing disaster preparedness and limiting business failure following a disaster will provide economic stability.	New
Action 3.3.1.4. Target business –related mitigation materials to vulnerable areas. **(ongoing)**	CDBG Funding	Businesses are excellent and important partners in community mitigation efforts.	Business participation in mitigation activities will reduce future loss and build strong partnerships.	New

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.3.1.5. Develop storage instructions and directives regarding mitigation techniques for storage of historic artifacts and documents being stored in below grade locations such as basements. **(within three years)**	General Revenue Funds	The State Historical Society and the Illinois State Archives have technical expertise in proper storage of historical artifacts and documents. Their guidance will assist not only state agencies, but could be passed to local jurisdictions.	Many historic artifacts and documents are irreplaceable or extremely costly to repair. Developing proper storage techniques will limit potential loss of these items.	New

Strategy 3.3.2. Assist other state agencies in identifying structures located in hazardous areas.
Lead Agency: (IEMA)
Supporting Agency: (IHPA),(IDNR/OWR),(CMS),(IDOT),(IDOC),(IDPH),(IEPA),(ICC) & (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.3.2.1. Work with IHPA to identify elevations of historic structures in the floodplain or Mercalli zone 8 or above and evaluate and fund mitigation activities. **(ongoing)**	General Revenue Funds	GIS and HAZUS-MH allow us to efficiently identify at risk properties and we can then decide the appropriate mitigation action.	Historic structures are important to the fabric of life. Part of preservation is minimizing the risks from hazards. This will be part of the updated INHMP.	Continuing Added Support Agencies
Action 3.3.2.2. Work with CMS to identify the elevations of state owned/operated facilities in the floodplain or Mercalli zone 8 or above and evaluate and fund mitigation activities. **(ongoing)**	General Revenue Funds	GIS and HAZUS-MH allow us to efficiently identify at risk properties and we can then decide the appropriate mitigation action.	State facilities serve the public and to ensure continuity of service we need to minimize the risks from hazards. This will be part of the updated INHMP.	Conducting statewide HAZUS-MH analysis on over 230 State facilities and 14,000 local essential facilities

Actions	Project Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.3.2.3. Provide workshops on wind refuge areas for local ESDA/EMA staff, CMS building managers and university safety officers. **(ongoing)**	General Revenue Funds	In the course of developing the Plan we discovered that no one is providing this training. The risk of tornadoes makes this important for public safety. The ESDAs/EMAs could advise anyone interested at a local level.	This is an educational program that works with partners to educate them on appropriate mitigation measures.	Unchanged Staffing and Funding Levels
Action 3.3.2.4. Make presentations on the importance of and available funding for hazard resistant construction to Park District Associations. **(ongoing)**	General Revenue Funds	The lack of structures makes people in parks especially vulnerable to natural hazards. We need to ensure that the available shelters are disaster resistant.	This is an educational program that works with partners to educate them on methods to protect vulnerable populations.	Continuing Added Supporting Agencies
Action 3.3.2.5.Create and maintain a tracking system for all Privately Owned Wastewater Treatment Systems. **(ongoing)**	General Revenue Funds	This ensures that information on all existing systems is collected and all future maintenance actions are tracked.	This will aid in determining the status of these systems following a flood event.	New
Action 3.3.2.6. Perform hazard mitigation reviews for electric, natural gas, and water utility construction projects. **(ongoing)**	General Revenue Funds Department of Energy Funds	Reviews and approvals of electric, natural gas, and water utility construction projects should include a determination of floodplain impacts and mitigation.	Conducting hazard mitigation reviews prior to construction will assist in limiting future impacts from hazards.	New
Action 3.3.2.7. Survey State Historic Sites to determine shelter locations and availability for visitors and staff. **(within three years)**	HMGP Funds General Revenue Funds	Proper shelter locations should be located in the event of a natural hazard for all visitors at a State Historic site. If one is not available, possible funding should be explored to construct a suitable shelter.	State Historic Sites attract thousands of visitors annually. In order to ensure life and property safety; shelters should be located on said locations.	New

Objective 3.4. Leverage resources and expertise that will further hazard mitigation efforts.

Strategy 3.4.1. Develop and track joint mitigation/conservation projects with IDNR, DCEO, DOA, land trusts and environmental groups.
Lead Agency: (IEMA)
Supporting Agency: (IDNR/OWR) & (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 3.4.1.1. Develop a resource guide book that identifies other sources for funds or advice on mitigation. **(annually)**	General Revenue Funds	Mitigation resources need to be compiled in one location so no resources are overlooked.	This educates local jurisdictions on mitigation partners and their resources. By identifying other resources it increases the possibility of mitigation projects.	Unchanged Staffing and Funding Limitations
Action 3.4.1.2. Keep the atlas of acquired properties up to date. **(IEMA) (annually)**	General Revenue Funds	To ensure deed restrictions are being enforced, we need to know where every property is located. GIS coding is required in applications	Lack of enforcement of deed restrictions would undermine the acquisition program.	Continuing
Action 3.4.1.3. Continue to maintain and improve the "Local Mitigation Action Item Database" to track local mitigation plan actions and associated projects. **(ongoing)**	General Revenue Funds HMGP Funds	Provides basis for a continued review and update of local mitigation plans. It also will assist with the coordination between the State HMP is in line with local mitigation actions.	Identification of mitigation action items that are successfully implemented will provide better examples of how to implement.	New

GOAL 4. Increase public understanding, support, education and demand for hazard mitigation planning and projects; to protect public services, utilities and critical facilities from potential damage from natural hazard events.

Objective 4.1. Identify hazard-specific issues and needs.

Strategy 4.1.1. Coordinate with key local officials to determine local issues and concerns as well as local, state and federal actions previously taken.
Lead Agency: (IEMA)
Support Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.1.1.1. Attend and make presentations at the annual IEMA and IESMA conferences. **(annually)**	General Revenue Funds	This is a free way to present mitigation ideas to an audience interested in mitigation.	By involving local coordinators it builds the team that is working on mitigation and increases the chance of mitigation ideas being applied as a solution.	Continuing Conferences attended in 2011, 2012 & 2013
Action 4.1.1.2. Hold meetings with Key Elected Officials, as requested. **(ongoing)**	General Revenue Funds	This is a method to explain in detail the benefits of mitigation to people in a position to promote projects.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Continuing
Action 4.1.1.3. Attend additional professional conferences to make presentations regarding mitigation and funding availability. **(annually)**	General Revenue Funds	Attending a variety of different professional conferences will provide mitigation information to a broader base of individuals.	Dependent on the type of mitigation project, different local agencies may take the lead regarding the project. By involving a broader base of individuals will increase the awareness of local officials.	New

Objective 4.2. Heighten public awareness of natural hazards.

Strategy 4.2.1. Use the IEMA website to inform the public about natural hazards.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.2.1.1. Develop "History of Natural Disasters in Illinois" page for website. **(ongoing)**	General Revenue Funds	This can serve as a resource for jurisdictions working on their plan, for students working on papers, and for interested members of the public.	This assists in the development of plans and provides a tool for educating the public. It also saves mitigation resources by making the information easily accessible.	Complete Past Occurrence and impact database compiled for 60 years' worth of Illinois hazards
Action 4.2.1.2. Post hazard maps, including the Mercalli index on the website. **(ongoing)**	General Revenue Funds	This can serve as a resource for jurisdictions working on their plan, for students working on papers, and for interested members of the public.	This assists in the development of plans and provides a tool for educating the public. It also saves mitigation resources by making the information easily accessible.	Unchanged Staffing Limitations
Action 4.2.1.3. Continue to improve and update the website. **(ongoing)**	General Revenue Funds	This can serve as a resource for jurisdictions working on their plan, for students working on papers, and for interested members of the public. It publicizes success stories.	This assists in the development of plans and provides a tool for educating the public. It also saves mitigation resources by making the information easily accessible.	Continuing Updated bi-annually
Action 4.2.1.4. Use the IEMA website to draw attention to the potential problem of using basements for storage in homes and public facilities. **(ongoing)**	General Revenue Funds	This is a method of educating the public on a widespread hazard.	This advises the public on mitigation tools to minimize risk.	Unchanged Staffing Limitations

Strategy 4.2.2. Launch or participate in awareness campaigns and special events.
Lead Agency: (IEMA)
Support Agency: (NSW)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.2.2.1. Participate in Severe Winter Storms Awareness Week. **(annually)**	General Revenue Funds	This is a method to partner with media outlets to educate the public on risks and how to mitigate them.	This educates the public on risks and the tools to mitigate the risks.	Continuing
Action 4.2.2.2. Participate in Tornado Awareness Week. **(annually)**	General Revenue Funds	This is a method to partner with media outlets to educate the public on risks and how to mitigate them.	This educates the public on risks and the tools to mitigate the risks.	Continuing
Action 4.2.2.3. Participate in Earthquake Awareness Week. **(annually)**	General Revenue Funds	This is a method to partner with media outlets to educate the public on risks and how to mitigate them.	This educates the public on risks and the tools to mitigate the risks.	Continuing
Action 4.2.2.4. Participate in Lightning Safety Awareness Week. **(annually)**	General Revenue Funds	This is a method to partner with media outlets to educate the public on risks and how to mitigate them.	This educates the public on risks and the tools to mitigate the risks.	Continuing
Action 4.2.2.5. Work with the IEMA PIO to maintain other natural disaster Awareness Weeks. **(ongoing)**	General Revenue Funds	Not all hazards have awareness weeks. In order educate the public on risks not highlighted by other groups.	This educates the public on risks and the tools to mitigate the risks.	Continuing
Action 4.2.2.6. Work with libraries and/or bookstores to develop and promote a list of recommended books. **(annually)**	General Revenue Funds	This could work in conjunction with the awareness weeks to draw attention to natural hazards. In libraries it could be linked with mitigation information.	This educates the public on risks and the tools to mitigate the risks.	Unchanged Staff Limitations
Action 4.2.2.6. Promote the National Weather Service (NWS) Storm Ready Program**. (ongoing)**	General Revenue Funds	This program promotes safety from severe weather. It is essentially a mitigation program.	This educates the public on risks and the tools to mitigate the risks. This is a worthwhile program that needs promotion.	Continuing

Strategy 4.2.3. Publicize and encourage the use of warning systems.
Lead Agency: (**IEMA**)
Supporting Agency: (NWS)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.2.4.1. Promote the advantages of weather radios to the general public. **(ongoing)**	General Revenue Funds	Weather radios can serve multiple functions and provide the best method of providing warnings to the public.	Adequate warning is necessary to avert loss of life. The public needs to be educated on the most effective warning systems.	Continuing
Action 4.2.4.2. Encourage jurisdictions to keep outdoor warning sirens in good condition. **(ongoing)**	General Revenue Funds	There are not state funds available to install outdoor warning sirens, so it is important that existing ones are maintained.	Adequate warning is necessary to avert loss of life. Locals need to be encouraged to maintain their systems.	Continuing
Action 4.2.4.3. Publicize the use and limitations of outdoor warning sirens. **(ongoing)**	General Revenue Funds	Most people misunderstand the purpose of warning sirens and need to be educated that they are not meant to warn people indoors.	Adequate warning is necessary to avert loss of life. The public needs to be educated on the most effective warning systems.	Continuing
Action 4.2.4.4. Encourage jurisdictions to warn at-risk population groups of the dangers of heat waves and ways to avoid the danger. **(ongoing)**	General Revenue Funds	Heat waves are generally unrecognized as a natural disaster. Mitigation steps by local jurisdictions can reduce the causalities.	Education of the public on the risks and the tools to mitigate the risks can prevent harm to numerous people. Keep Cool Illinois	Continuing
Action 4.2.4.5. Encourage jurisdictions to warn at-risk population groups of the dangers of extreme cold and ways to avoid the danger. **(ongoing)**	General Revenue Funds	Extreme cold is generally unrecognized as a natural disaster. Mitigation steps by local jurisdictions can reduce the causalities.	Education of the public on the risks and the tools to mitigate the risks can prevent harm to numerous people. Keep Warm Illinois	Continuing

Objective 4.3. Publicize and encourage the adoption of appropriate hazard mitigation measures.

Strategy 4.3.1. Provide information on mitigation techniques in the aftermath of disasters.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.3.1.1. Attend public meetings to discuss mitigation programs. **(ongoing)**	General Revenue Funds	This is an opportunity to explain in detail the benefits of mitigation to people in a position to participate in projects.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Continuing
Action 4.3.1.2. Ensure mitigation is represented in the Joint Field Offices (JFOs). **(ongoing)**	General Revenue Funds	People affected by disaster are the most likely to take steps to ensure they avoid future losses.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Continuing
Action 4.3.1.3. Organize wind-resistant construction and/or safe room workshops in the aftermath of tornadoes. **(ongoing)**	General Revenue Funds	People affected by disaster are the most likely to take steps to ensure they avoid future losses.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Unchanged Staffing and Funding Limitations

Strategy 4.3.2. Establish methods for outreach.
Lead Agency: (MCSC)
Supporting Agency: (IEMA),(ARC) & (IAFSM)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.3.2.1. Assemble a comprehensive list of potential methods for outreach. **(MCSC) (ongoing)**	General Revenue Funds	A list of outreach methods will make certain we maximize our outreach efforts.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Continuing
Action 4.3.2.2. Determine appropriateness, cost-effectiveness and timeliness of each option. **(IMAG-SC) (within three years)**	General Revenue Funds	Limited resources increase the importance of finding the most cost effective outreach methods.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing and Funding Limitations
Action 4.3.2.3. Consider appropriate media usage (print media, electronic media, direct mail, outdoor media, supplementary media and news media). **(IMAG-SC) (within three years)**	General Revenue Funds	Limited resources increase the importance of finding the most cost effective outreach methods.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing and Funding Limitations
Action 4.3.2.4. Utilize public access channels to show mitigation videos. **(IMAG-SC) (annually)**	General Revenue Funds	By using mitigation videos already created, this is a free way to reach the public with extended messages.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing and Funding limitations
Action 4.3.2.5. Provide grant funds to the Illinois Association for Floodplain and Storm water Management to develop and maintain an interactive flood mitigation website that identifies mitigation activities to minimize flood damage. **(IMAG-SC) (ongoing)**	HMGP 5% funds IASFM matching	The web is increasingly where people go to find information. This would use IASFM expertise to make sure the information is correct.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Updated

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.3.2.6. Present information and techniques at home improvement retail stores (Lowe's, Home Depot, Menards, etc.). (**IEMA and American Red Cross) (ongoing)**	HMGP 5% funds American Red Cross matching	People go to home improvement stores to learn how to upgrade their homes. They benefit by selling mitigation products, we benefit by making them easily accessible to the public.	This educates people on the risks they face and the proper techniques to mitigate the risks. This increases the audience size.	Unchanged Staffing and Funding Limitations
Action 4.3.2.7. Provide focused hazard mitigation information to counties and municipalities based on the greatest identified risks. **(ongoing)**	General Revenue Funds	Providing a focused approach to the dissemination of hazard mitigation information will provide for a more direct approach to identifying potential mitigation projects.	Educating local jurisdictions regarding their greatest risks will assist in providing a focused approach to identifying potential mitigation techniques and increase accountability.	New

Strategy 4.3.3. Increase the public's exposure to hazard mitigation issues.
Lead Agency: (IEMA)
Supporting Agency: (ARC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.3.3.1. Develop a magazine style publication for distribution that provides information on mitigating natural hazards. **(within three years)**	HMGP 5% funds	Mitigation needs to be put into different packages to attract different audiences. This publication could be sent to libraries or given away at the State Fair.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Unchanged Staffing and Funding Limitations
Action 4.3.3.2. Develop mitigation public service announcements (PSAs) for distribution. **(within three years)**	General Revenue Funds	This is a relatively low cost way of presenting the mitigation message to the public.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Completed Continuing for 2013
Action 4.3.3.3. Develop and distribute a calendar with mitigation information. **(ongoing)**	HMGP 5% funds	Calendars can be produced for a reasonable cost. They are useful and people would get regular reminders on how to mitigate. They could be distributed at the State Fair.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Completed 2011 Deleted Not cost effective
Action 4.3.3.4. Ensure mitigation is represented in the Illinois tent at the State Fair. **(annually)**	General Revenue Funds	This is a low cost way of promoting mitigation to a new audience and questions can be answered in an informal setting.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Continuing Dependent on staff availability
Action 4.3.3.5. Provide materials to the State Library to ensure information on mitigation is available to the public. **(ongoing)**	General Revenue Funds HMGP 5% funds	It is important to make mitigation information available to the public. Many people prefer libraries to the internet.	This educates people on the risks they face and the proper techniques to mitigate the risks. It increases the mitigation audience.	Continuing

Strategy 4.3.4. Execute delivery.
Lead Agency: (IEMA)
Supporting Agency: (IDPH) & (DCEO)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.3.4.1. Develop and utilize all available partnerships. **(ongoing)**	General Revenue Funds	Limited resources make it important to work with groups with similar missions.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Continuing
Action 4.3.4.2. Provide low income citizens with energy assistance for extreme heat and extreme cold.**(DCEO) (annually)**	General Revenue Funds	Low income citizens lack the financial resources to pay for the utilities needed to prevent the weather from aggravating health conditions.	Heat waves are the deadliest natural disaster and can be mitigated by providing relief from the heat.	Completed Annually Continuing
Action 4.3.4.3. Provide information to the public on methods to minimize effects of extreme heat or cold. The programs are "Keep Cool Illinois" and "Keep Warm Illinois". **(IDPH) (annually)**	General Revenue Funds	The public needs to be aware of options they have to avoid the dangers of extreme temperatures.	Heat waves are the deadliest natural disaster and can be mitigated by providing relief from the heat. Cold weather can also be extremely dangerous.	Complete
Action 4.3.4.4. Provide grant funds to the American Red Cross to hire staff to promote disaster resistant construction. **(ongoing)**	HMGP 5% funds American Red Cross	This allows us to educate the public with a respected partner, who is viewed as looking out for the best interests of the public and not as a product salesman.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing Limitations
Action 4.3.4.5. Develop web based publications regarding mitigation methods, utilizing an all hazards approach. **(within three years)**	General Revenue & HMGP funds	The public needs to be aware of options they have to avoid the dangers of all identified hazards.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	New

Objective 4.4. Educate the public on the benefits of mitigation measures

Strategy 4.4.1. To utilize different methods to deliver the mitigation message to the public.
Lead Agency: (IEMA)
Support Agency: (ISWS) & (IFSM)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.4.1.1. Continue to develop success stories for the FEMA website. Provide a link from the IEMA website. **(ongoing)**	General Revenue Funds	By promoting positive mitigation on the FEMA web site we can educate the public on how mitigation works.	By understanding the positive ramifications of mitigation, the public and public officials are more likely to support it.	Continuing
Action 4.4.1.2. Provide information to any media reporting on past disasters and mitigation in the aftermath of a disaster. **(in the event of a disaster)**	General Revenue Funds	Interest is highest in mitigation following a disaster and on the anniversaries of disasters. This is an opportunity to reach the public with a mitigation message.	By understanding the positive ramifications of mitigation, the public and public officials are more likely to support it.	Continuing
Action 4.4.1.3. Distribute mitigation materials to all of the libraries in the State. **(ongoing)**	HMGP 5% funds	It is important to make mitigation information available to the public. Many people prefer libraries to the internet.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Deleted Duplicate Item (Action 4.3.3.5)
Action 4.4.1.4. Work with IAFSM to conduct flood proofing workshops. **(annually)**	CAP funds	These are proven tools for meeting the public and discussing their individual situations with them.	This educates people on the risks they face and the proper techniques to mitigate the risks. It increases the mitigation audience.	Continuing Coordinating with RiskMAP Discovery and Resilience meetings
Action 4.4.1.5. Earthquake Coordinator will conduct outreach and education. **(ongoing)**	General Revenue Funds	The mitigation staff has not had the resources to work on earthquake issues. This is a method of educating the public on a serious risk.	This educates people on the risks they face and the proper techniques to mitigate the risks. It increases the mitigation audience.	Continuing

Objective 4.5. Help educate the public on the benefits of hazard-resistant construction and site planning.

Strategy 4.5.1. To increase the demand by the public for hazard-resistant construction.
Lead Agency: (IEMA)
Support Agency: (ARC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.5.1.1. Work with the American Red Cross to promote hazard resistant construction by having representatives at home shows and at other public presentations. **(ongoing)**	HMGP 5% funds American Red Cross match	This allows us to educate the public with a respected partner, who is viewed as looking out for the best interests of the public and not as a product salesman. This target an audience interested in improving their homes.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing/ Funding Limitations

Strategy 4.5.2. To provide the public with information on building codes to enable them to make informed decisions.
Lead Agency: (CDB)
Supporting Agency: (IEMA) & (Department of Insurance)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.5.2.1. Require 3 hours of flood insurance training for all licensed insurance agents. **(Dept. of Insurance) (ongoing)**	General Revenue Funds	This is required by Federal law and increases knowledge of how the NFIP works.	Insurance agents with better training in the NFIP can promote flood insurance which decreases uninsured losses.	Continuing
Action 4.5.2.2. Provide the public and construction industry with a one-stop shop for code information. **(CDB) (ongoing)**	General Revenue Funds	Providing a one-stop shop for code information aides in the implementation of building codes by reducing the burden and making sure all the laws are followed.	This educates people on the risks they face and the proper techniques to mitigate the risks.	Continuing
Action 4.5.2.3. Provide links on the IEMA mitigation website to sites where individuals can learn more about building codes. **(IEMA) (ongoing)**	General Revenue Funds	Correct building techniques are an important mitigation tool. The codes are the best source for these techniques.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Continuing

Objective 4.6. Help create a workforce trained in hazard resistant construction techniques.

Strategy 4.6.1. To make mitigation a factor in training the building tradesmen.
Lead Agency: (IEMA)
Support Agency: (ISBE)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.6.1.1. Work with the State Board of Education (SBE) to provide hazard resistant construction information to vocational school teachers. **(within three years)**	General Revenue Funds	Vocational school teachers are an important audience because of the training they provide to young people. We need to provide them with the information they need to provide proper instruction.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing/Funding Limitations
Action 4.6.1.2. Work with SBE to provide workshops for vocational school teachers. **(within three years)**	General Revenue Funds	Workshops will allow us to promote mitigation to educators and improve the training of the future workforce.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing/Funding Limitations
Action 4.6.1.3. Provide workshops for construction workers on hazard resistant construction. Work with construction unions and building associations to organize these workshops. **(within three years)**	General Revenue Funds HMGP 5%	Workshops will allow us to provide training and improve the skills of the current workforce. These skills make the workers more employable and provide a workforce trained in mitigation techniques.	To reach the largest audience and to repeat the message, we need to utilize as many outreach methods as possible.	Unchanged Staffing/Funding Limitations

Objective 4.7. Maximize available post-disaster "windows of opportunity" to implement major mitigation outreach initiatives.

Strategy 4.7.1. Participate in PDA activities immediately following a disaster.
Lead Agency: **(IEMA)**

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.7.1.1. Assign staff to mitigation outreach teams. **(in the event of a disaster)**	General Revenue Funds	Personally seeing the hazard and its effects educates the mitigation staff on effective mitigation solutions.	The better the understanding of the hazards the better the choice of solutions.	Continuing

Strategy 4.7.2. Document and disseminate information on losses avoided.
Lead Agency: (IEMA)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.7.2.1. Coordinate with local officials to collect digital pictures and field reports. **(ongoing)**	General Revenue Funds	The locals are on the scene and can tell us when losses are avoided and can provide us with the information at no cost.	It provides us with information to inform people of mitigation successes and reinforces the success of the program for the locals.	Continuing
Action 4.7.2.2. Incorporate findings into future volumes of success story documents. **(ongoing)**	General Revenue Funds	This provides a source for best practices and is used to promote mitigation.	Success stories are often used to sell other jurisdictions on the need for mitigation.	Continuing
Action 4.7.2.3. Post success story articles on the mitigation website. **(ongoing)**	General Revenue Funds	By promoting positive mitigation on our website we can educate the public on how mitigation works.	By understanding the positive ramifications of mitigation, the public is more likely to support it.	Continuing
Action 4.7.2.4. Present information to the policy makers. **(ongoing)**	General Revenue Funds	It is important for the policy makers to understand how mitigation works.	By understanding the positive ramifications of mitigation, policy makers are more likely to support it.	Continuing

Strategy 4.7.3. Maximize available Federal resources.
Lead Agency: (IEMA)
Supporting Agency: (INHMPC)

Actions	Projected Resources	Rational for Action	How Action Contributes to Mitigation Strategy	Update Status (2013)
Action 4.7.3.1. Work toward an enhanced state mitigation plan. **(INHMPC) (within three years)**	General Revenue Funds	Enhanced plans improve the delivery of mitigation services and increase the HMGP allocations.	It is in the interest of mitigation to run the programs as effectively as possible and to maximize the dollars spent on mitigation in the State.	Unchanged Staffing and Funding Limitations

Illinois Hazard Mitigation Funding Sources

The State of Illinois works in partnership with the Federal Emergency Management Agency to provide funding for hazard mitigation in the State of Illinois. The State provides the funding for the hazard mitigation staff and the Illinois Department of Natural Resources' Flood Hazard Mitigation Program; FEMA provides funding for mitigation projects through the HMGP, FMA, and PDM programs. The State of Illinois promotes the participation in these FEMA grant programs in an effort to maximize the mitigation efforts throughout the State. The use of these federal grant funds has been extremely successful throughout the years.

All of the Federal program funds require a non-federal match. When there are not adequate state funds through the IDNR program to provide the matching funds, local jurisdictions have provided the match. In rare situations, the homeowners have been required to provide the match in order to participate in the project.

STATE FUNDING SOURCES

General Revenue Funds (GRF) The General Revenue Fund finances most of the activities associated with State government. These are funds that are raised by taxes and allocated by the legislature. These funds pay for the salaries and overhead associated with the mitigation staff and most state employees. Since most of the action items in the State Mitigation Plan are activities to be carried out by the State Hazard Mitigation Officer and his staff, the majority of action items are financed by the GRF. These are also the funds that are used to provide the non-Federal cost share should they be needed for management costs. According to the Illinois' Economic and Fiscal Policy Report (Public Act 96-1354) produced by the Governor's Office of Management and Budget in a report issued, January 2013, "Illinois faces tremendous fiscal challenges in the coming three years." Illinois' budget deficit is projected to continue to increase if significant reductions in spending are not implemented. The report indicates that; "Fiscal year 2015 and 2016 will require much larger reductions in spending, requiring extensive program re-design to meet the projected budget targets. The budget will balance with across-the-board spending reductions." This increased reduction directly correlates to a reduction of readily available funds to support implementation of many of the mitigation projects outline in the INHMP.

Flood Hazard Mitigation Program The Illinois Department of Natural Resource's Flood Hazard Mitigation Program is administered through the Office of Water Resources' Resource Management Division. The Program is most frequently used to provide the matching funds for the HMGP or FMA funded acquisition projects, but it also fully funds its own mitigation projects. Funding for the Program comes from the sale of General Obligation Capital Bonds. Authority to sell the bonds is obtained through the legislative process on an annual basis. If funds are approved, they become part of the Governor's annual budget. The amount of funds varies from year to year, but the average expenditure is approximately one million dollars a year. The program operates on a reimbursement basis and cannot furnish funds for local jurisdiction's administrative costs or the purchase of personal property such as mobile homes.

CDBG Disaster Recovery "IKE" Program (DCEO)

The Consolidated Security, Disaster Assistance, and Continuing Appropriations Act, 2009 (Pub. Law 110-329), enacted on September 30, 2008, appropriated $6.5 billion dollars through the Community Development Block Grant (CDBG) program for "necessary expenses related to disaster relief, long-term recovery, and restoration of infrastructure, housing, and economic revitalization in areas affected by natural disasters occurring during 2008 for which the President declared a major disaster. The Illinois Department of Commerce and Economic Opportunity (DCEO), working closely with the Illinois Emergency Management Agency (IEMA), the Illinois Housing Development Agency (IHDA) and inviting input by communities, individuals and other interested parties, have developed an action plan that outlines the eligible activities available to assist counties to address these mitigation and critical restoration needs.

FEDERAL FUNDING SOURCES

Community Assistance Program (CAP) For more than 20 years, the State of Illinois has participated in FEMA's Community Assistance Program-State Support Services Element (CAP-SSSE). CAP-SSSE is a State grant mechanism which is effectively used to support the National Flood Insurance Program and State floodplain management objectives. This includes providing technical assistance to NFIP communities, evaluating community performance, monitoring floodplain development activities, and building community floodplain management expertise and capability. CAP also plays a critical role in the success of FEMA and State floodplain mapping priorities. In FY 2010, FEMA awarded $302,602 in funding

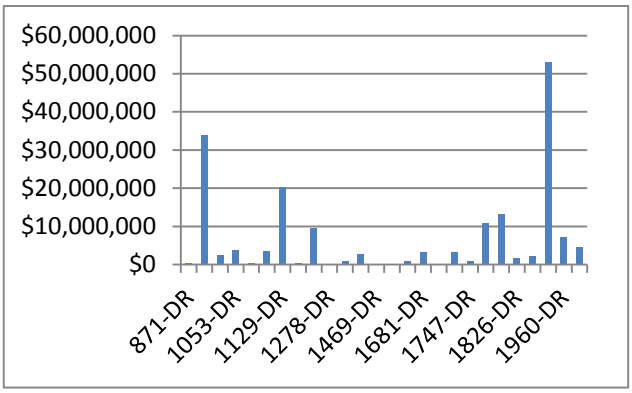
under the Community Assistance Program, State Support Services Element (CAP-SSSE) to the IL Department of Natural Resources. This grant supports two highly qualified floodplain management specialists, contractual obligations, and one clerical staff.

Hazard Mitigation Grant Program (HMGP) The HMGP has been the primary funding source for mitigation projects in Illinois. It is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Act. It provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the program is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The program was funded was calculated at 15% of the total Federal disaster expenditures. The Federal FY 2003 Omnibus Appropriations bill changed the formula used to determine funding from 15% to 7.5% of eligible disaster costs. Of the HMGP funds 7% may be used for planning projects and 5% may be used for initiatives that do not require a positive benefit/cost ratio.

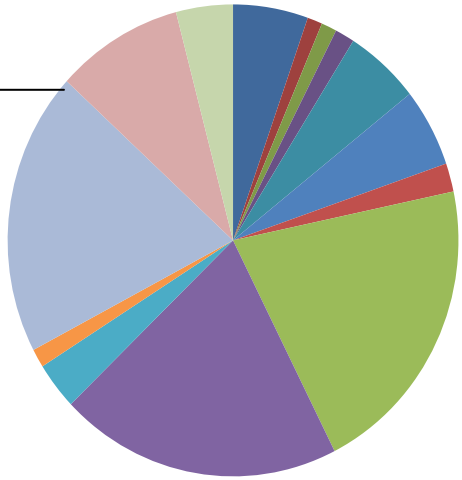
HMGP Awards Federal Share

FEMA 871-DR	$ 424,143	**FEMA 1278 -DR**	$ 116,847	**FEMA 1747-DR**	$918,936
FEMA 997 –DR	$ 33,859,205	**FEMA 1368 -DR**	$ 1,007,808	**FEMA 1771-DR**	$10,929,736
FEMA 1025 -DR	$ 2,607,000	**FEMA 1416 -DR**	$ 2,797,158	**FEMA 1800-DR**	$13,238,406
FEMA 1053 -DR	$ 3,690,441	**FEMA 1469 -DR**	$ 202,306	**FEMA 1826-DR**	$1,761,568
FEMA 1110 -DR	$ 421,005	**FEMA 1513 -DR**	$ 81,827	**FEMA 1850-DR**	$2,338,447
FEMA 1112 -DR	$ 3,542,964	**FEMA 1633 -DR**	$ 912,416	**FEMA 1935-DR**	$53,010,484
FEMA 1129 -DR	$ 20,419,462	**FEMA 1681 -DR**	$ 3,280,745	**FEMA 1960-DR**	$7,159,924
FEMA 1170 -DR	$ 369,013	**FEMA 1722-DR**	$273,823	**FEMA 1991-DR**	$4,624,853
FEMA 1188 -DR	$ 9,444,166	**FEMA 1729-DR**	$3,186,416		
Total	**$180,619,099**				

HMGP Awards Federal Share



HMGP Awards for Planning Efforts



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1722-DR 1729-DR 1747-DR 1771-DR 1800-DR
1826-DR 1850-DR 1935-DR 1960-DR 1991-DR

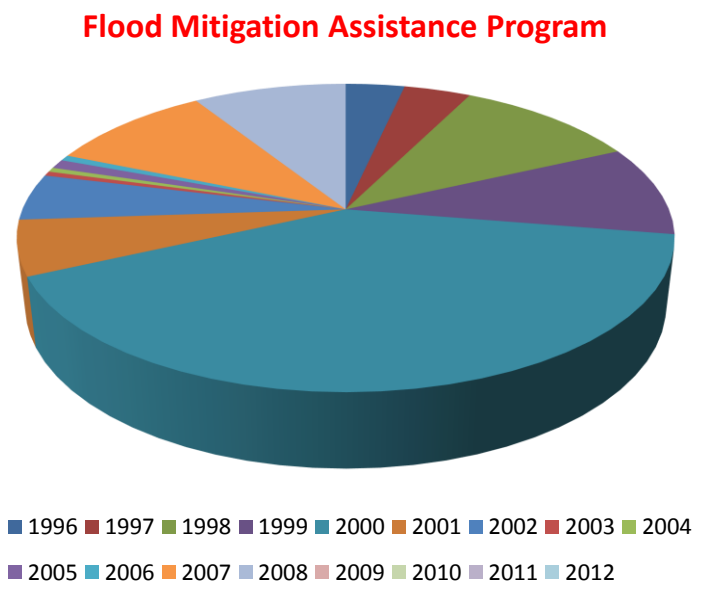
Flood Mitigation Assistance Program (FMA) FMA was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP). The funding, which is provided through the National Flood Insurance Fund, is calculated on the basis of flood insurance policies in the state and varies each year.

FMA provides funding to assist States and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). The State of Illinois has only used these funds for acquisition and planning.

There are three types of grants available under FMA: Planning, Project, and Technical Assistance Grants. FMA Planning Grants are available to States and communities to prepare Flood Mitigation Plans. NFIP-participating communities with approved Flood Mitigation Plans can apply for FMA Project Grants. FMA Project Grants are available to States and NFIP participating communities to implement measures to reduce flood losses. Ten percent of the Project Grant is made available to States as a Technical Assistance Grant. These funds may be used by the State to help administer the program, but the State of Illinois has always used these funds as part of the project grant.

Flood Mitigation Assistance Program (FMA)

Fiscal Year	Planning	Project
FY1996	$31,000	$123,820
FY1997	$0	$175,380
FY1998	$30,800	$447,728
FY1999	$24,400	$399,340
FY2000	$22,400	$1,788,320 (Funds were reallocated from other states)
FY2001	$21,200	$236,500
FY2002	$20,700	$198,100
FY2003	$21,200	$0
FY2004	$21,100	$0
FY2005	$20,300	$22,410 (Technical Assistance)
FY2006	$26,600	$0
FY2007	$0	$432,963 (Acquired 3 structures in Kane County)
FY2008	$0	$402,000 (elevate structures In Des Plaines - Methodist Camp)
FY2009	$0	$0
FY2010	$0	$0
FY2011	$0	$0
FY2012	$0	$0
Total	$239,700	$4,226,561



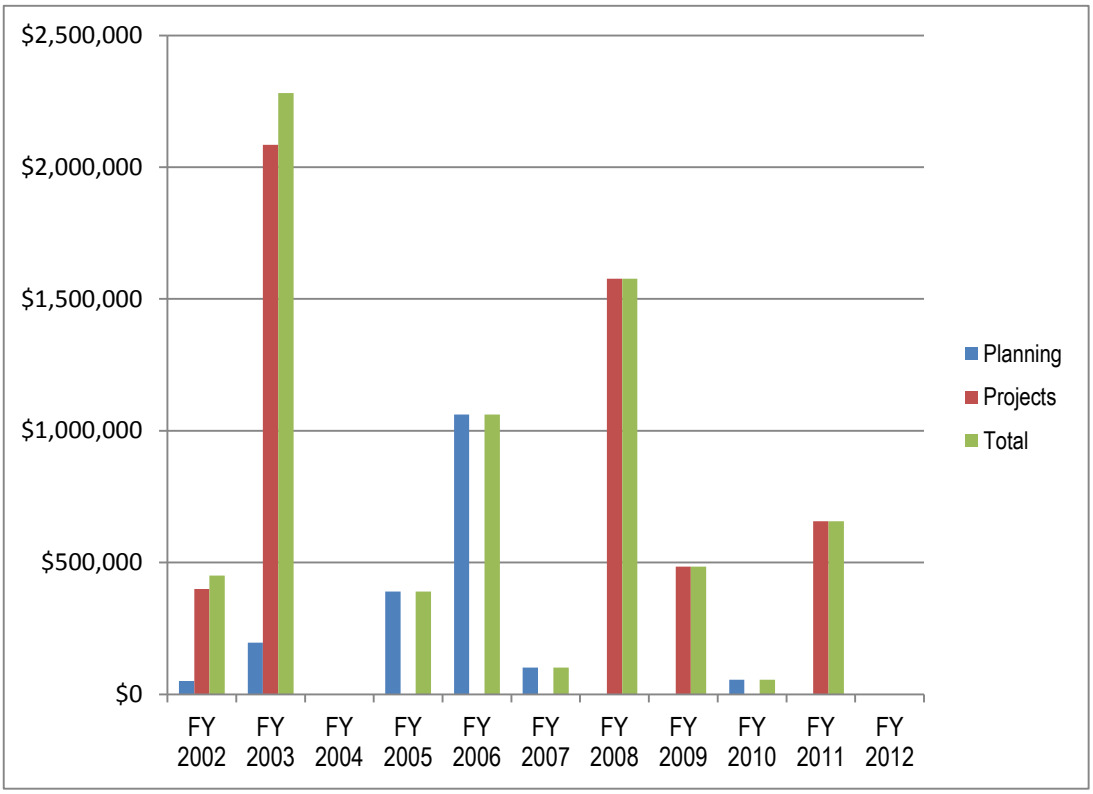
Pre-Disaster Mitigation Grant Program (PDM) The Pre-Disaster Mitigation Program was authorized by §§203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act), 42 USC, as amended by §§102 of the Disaster Mitigation Act of 2000. Funding for the program is provided through the National Pre-Disaster Mitigation Fund to assist States and local governments in implementing cost-effective hazard mitigation activities that complement a comprehensive mitigation program. An applicant must be in good standing with the NFIP in order to participate.

44 CFR Part 201, Hazard Mitigation Planning, establishes criteria for State and local hazard mitigation planning authorized by §§322 of the Stafford Act, as amended by §§104 of the DMA. After November 1, 2003, local governments applying for PDM funds through the States will have to have an approved local mitigation plan prior to the approval of local mitigation project grants. States will also be required to have an approved Standard State mitigation plan in order to receive PDM funds for State or local mitigation projects after November 1, 2004.

For fiscal years 2002 and 2003, FEMA provided a set amount of PDM funds to establish the program and to provide funding for local jurisdictions to develop DMA2k compliant plans. In Illinois, the previous SHMO believed that removing people from the floodplain should remain the priority and used the $400,000 of FY 2002 PDM funds for an acquisition project in Rock Island County. $50,000 in FY 2002 PDM funds were also granted to the State to assist in establishing the program.

Fiscal Year	Planning	Projects	Total
FY 2002 PDM	$50,000 (Establish State Program)	$400,000	$450,000
FY 2003 PDM	$196,387	$2,084,862	$2,281,249
FY 2004 PDM	$0	$0	$0
FY 2005 PDM	$390,003	$0	$390,003
FY 2006 PDM	$1,062,000	$0	$1,062,000
FY 2007 PDM	$101,166	$0	$101,166
FY 2008 PDM	$0	$1,577,000	$1,577,000
FY2009 PDM	$0	$484,365	$484,365
FY2010 PDM	$54,750	$0	$54,750
FY 2011 PDM	$0	$656,625	$656,625
FY 2012 PDM	$0	$0	$0

PDM Funding
(Planning & Project Comparison)



Repetitive Flood Claims (RFC) The Repetitive Flood Claims grant program (RFC) makes funds available on an annual basis to reduce or eliminate flood damages to insured properties that have one or more NFIP claims. The grant operates under a 75% Federal/25% Local cost share, or a 100% Federal cost share if the applicant demonstrates that the project cannot be funded under FMA or a local match is unavailable. Typical activities would be acquisition and relocation or demolition of properties.

Severe Repetitive Loss (SRL) The Severe Repetitive Loss grant program (SRL) will make funds available on an annual basis to reduce or eliminate the long-term risk of flood damage to structures insured by the NFIP and identified by FEMA as SRL structures. Specifically, SRL structures are residential properties that have at least four NFIP claims over $5,000 each, at least two of which occur within ten years of each other, or that have had at least two structural claims within ten years of each other that cumulatively exceed the value of the structure. SRL will operate under a 75% Federal/25% Local cost share. Typical activities would be acquisition and demolition of properties, or elevation. Guidance for this program has not been released.

FY 2008

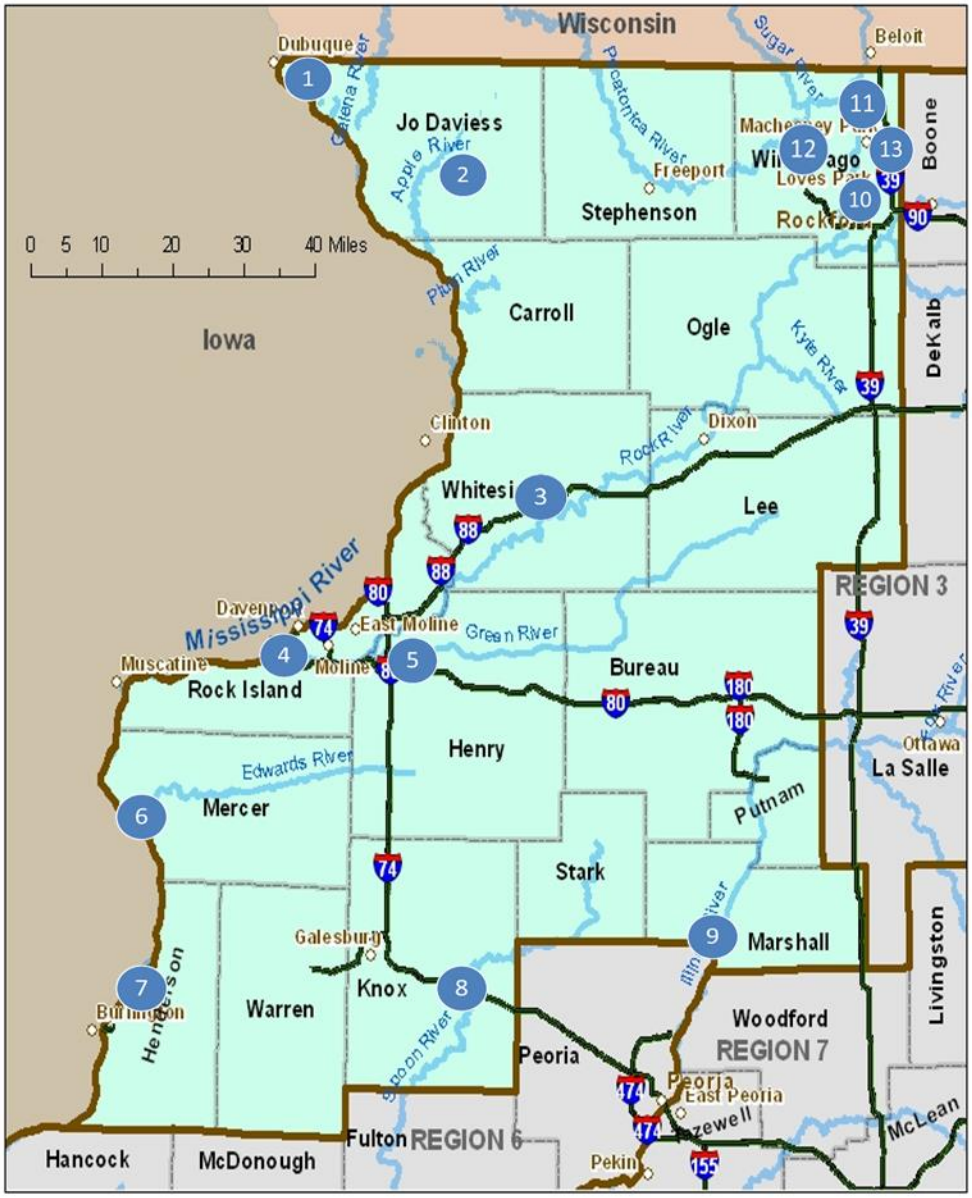
Lake County Elevation	$58,500
Total	$58,500

Cooperating Technical Partners (CTP) There is a significant challenge keeping flood hazard maps current. This program is an innovative approach to creating partnerships between FEMA and participating NFIP communities, regional agencies, and State agencies that have the interest and capability to become more active participants in the in the FEMA Flood Hazard mapping program.

Map Modernization Management Support (MMMS) The purpose of the MMMS program is to provide, through a Cooperative Agreement, a means to ensure that MMMS Partners can support the Map Modernization effort through activities that do not directly result in production of a new or revised flood hazard map. These support activities include administration and management activities.

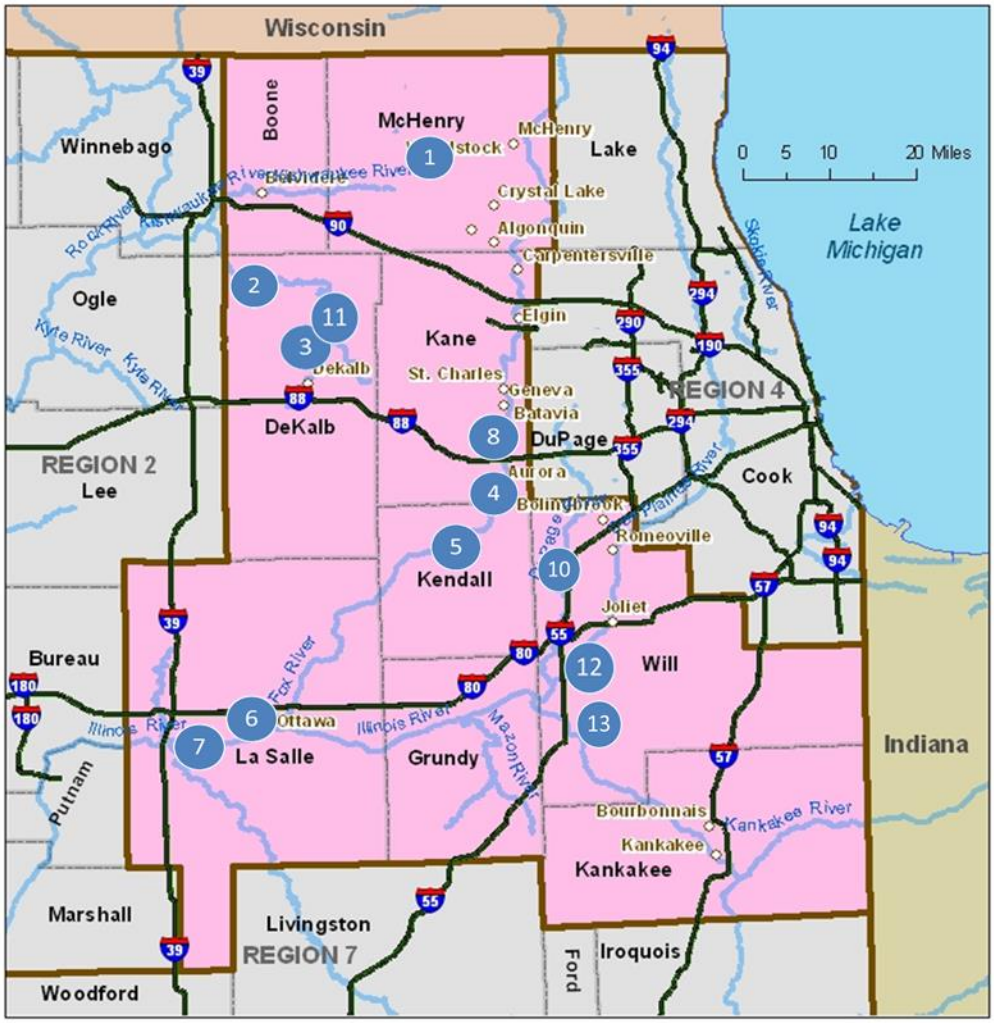
The next page has a State map showing the location of floodplain mitigation projects since the 1993 flood disaster (FEMA 997).

Illinois Floodplain Mitigation Projects
(Northwest Illinois) IEMA Region 2



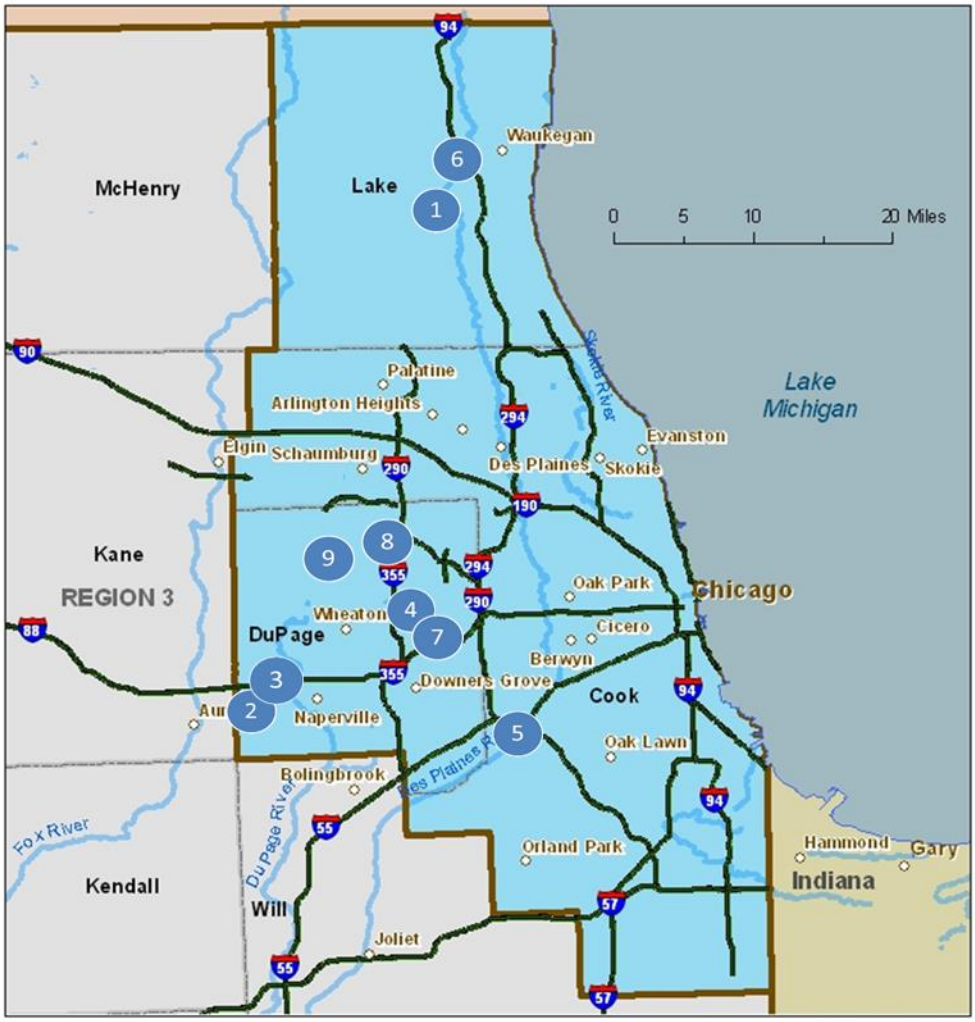
Jurisdiction:	# of Acquisitions
1- East Dubuque – 1188,1278,1416,FMA	(35)
2- Jo Daviess County – 1188	(2)
3- Whiteside County – 1188	(7)
4- Rock Island Co.– 997,1188,1368,1416,FMA	(67)
5- Cleveland – 1188, FMA	(34)
6- Keithsburg – 997	(110)
7- Oquawka – 997	(34)
8- Knox County – 997	(14)
9- Sparland – 1188	(19)
10- Rockford – 1681, 1771	(80)
11- Machesney Park– 1729,1826	(49)
12- Blackhawk Island – 1771	(90)
13-Edgemere Terrace- 1771	(12)
Total:	**(553)**

Illinois Floodplain Mitigation Projects
(North Central Illinois) IEMA Region 3



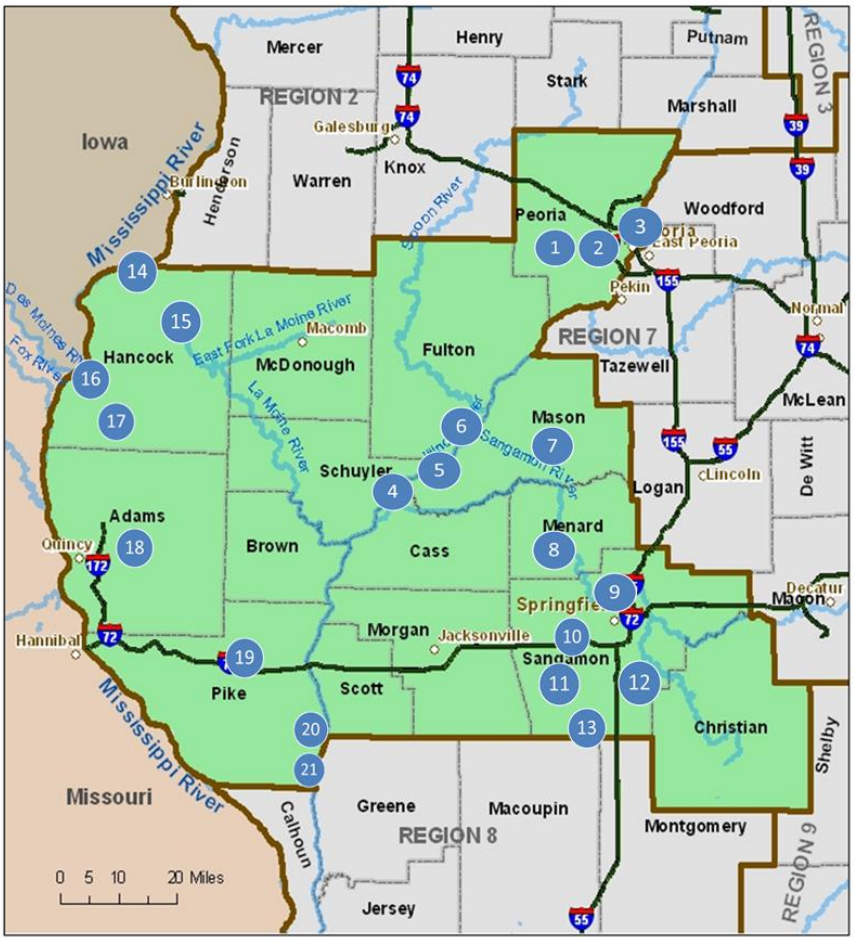
Jurisdiction:	# of Acquisitions
1- McHenry County – 977	(1)
2- Kirkland – 1129	(65)
3- DeKalb County – 1188	(6)
4- Montgomery – 1129	(39)
5- Kendall County – 1188, FMA	(9)
6- Ottawa – 1129, 1771	(65)
7- LaSalle County – 1129	(14)
8- Aurora – 1722	(1- Culvert)
9- Streator – 1771	(1)
10- Will County – 1800	(19)
11- Evergreen Village– 1800	(129)
12- Shorewood- 1129	(47)
13- Bird's Bridge 1129	(15)
Total:	**(411)**

Illinois Floodplain Mitigation Projects
(Northeast Illinois) IEMA Region 3



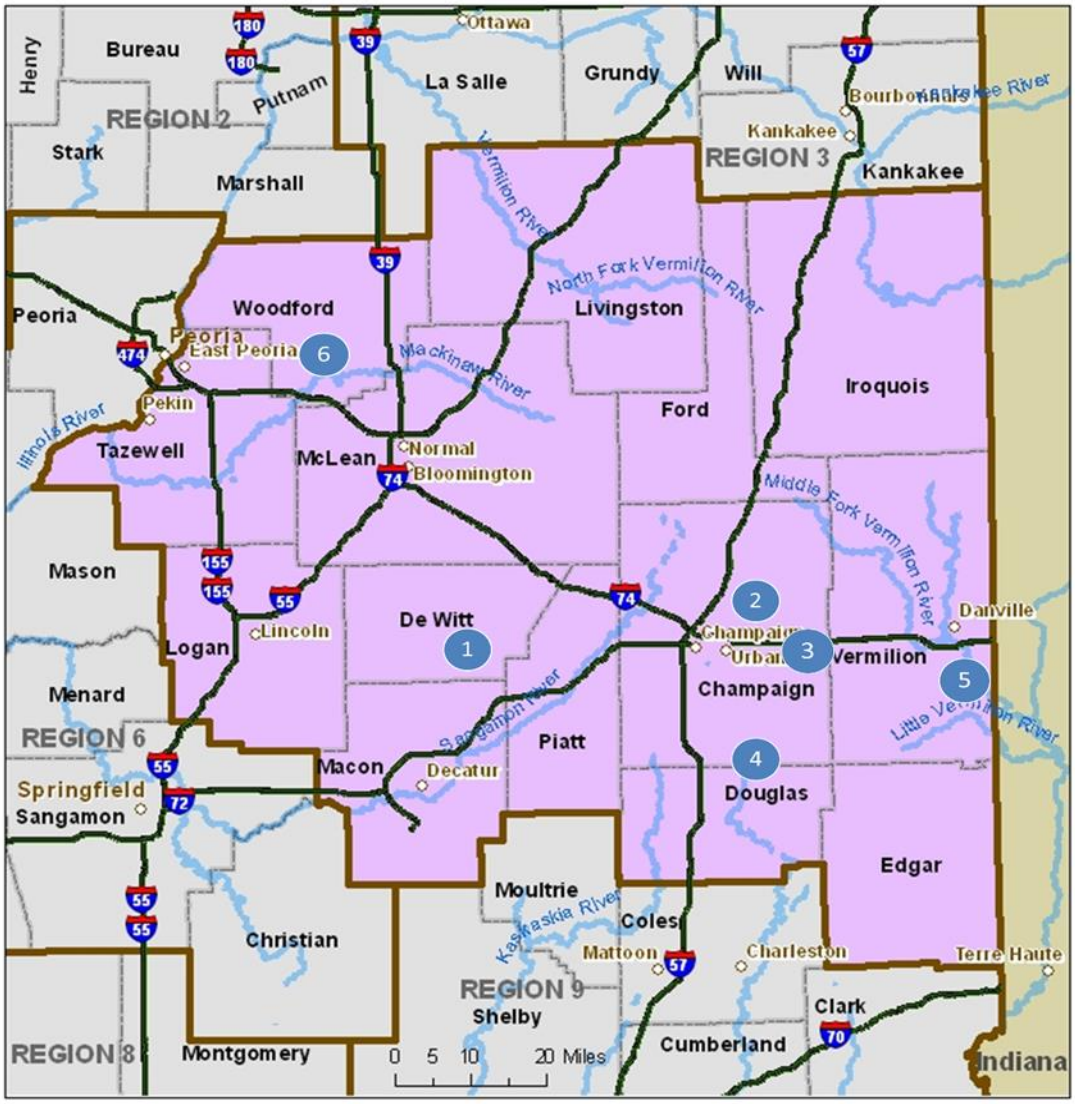
Jurisdiction:	# of Acquisitions
1- Lake County – 1110,1112,1129,1850	(62)
2- Aurora – 1129	(25)
3- Aurora Township – 1129	(22)
4- DuPage County – 1129	(49)
5- Palos Hills – 1129	(3)
6- Gurnee – 1771	(1)
7- Oak Brook – 1935	(1)
8- Addison – 1800	(14)
9- Carol Stream – 1747	(4)
Total:	**(181)**

Illinois Floodplain Mitigation Projects
(West Central Illinois) IEMA Region 6



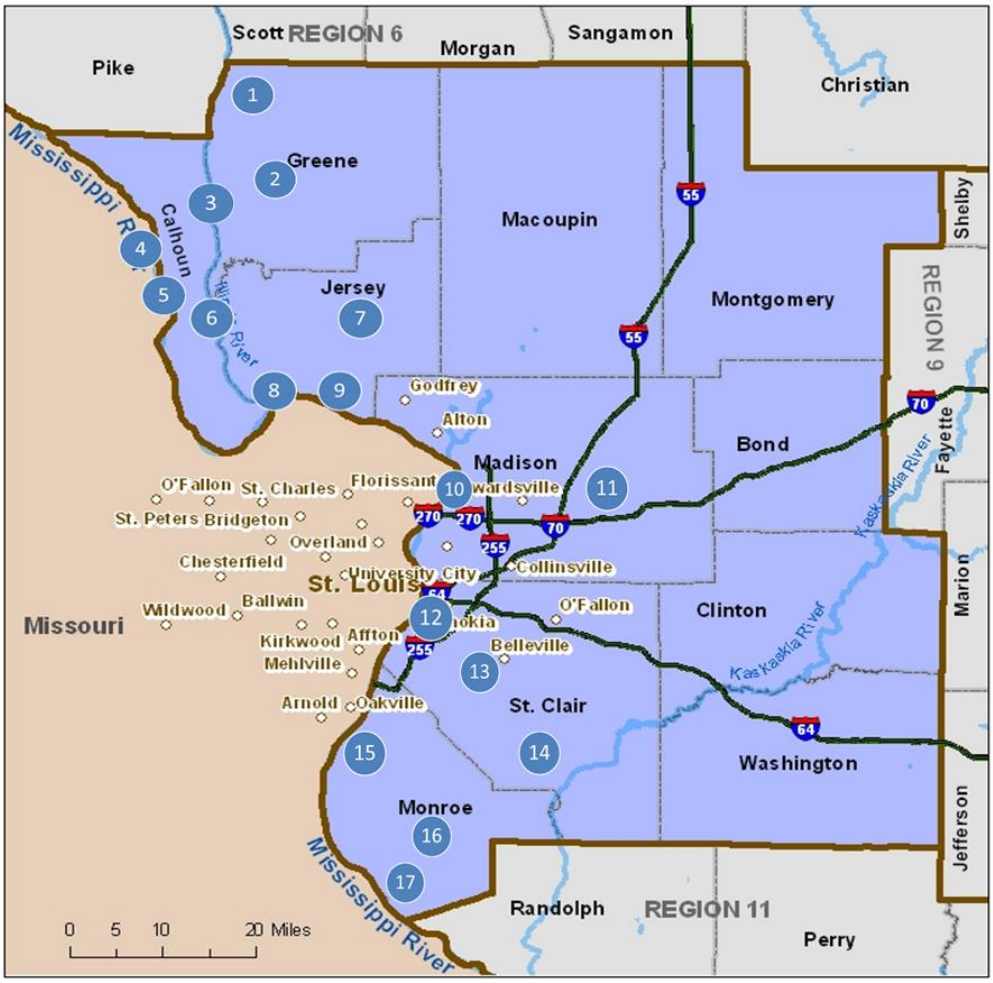
Jurisdiction:	# of Acquisitions				
1- Peoria County – 1188,FMA	(14)	8- Petersburg- 1025,1112	(43)	15- Hancock County- 997	(49)
2- Peoria Heights – FMA	(20)	9- Riverton- 1416	(6)	16- Warsaw- 997	(5)
3- Peoria – 1188,FMA	(3)	10- Sangamon County - 1025,1416	(20)	17- Rocky Run Township- 997	(13)
4- Browning – 997	(54)	11- Chatham- 1025,1053,1129	(9)	18- Adams County- 997	(20)
5- Bath – 997	(9)	12- Pawnee- 1112	(3)	19- Pike County- 997	(33)
6- Havana – 1771	(49)	13- Divernon- 1416	(8)	20- Pearl- 997,1469	(11)
7- Mason County- 997	(28)	14- Pontoosuc- 997	(25)	**Total:**	**(442)**

Illinois Floodplain Mitigation Projects
(East Central Illinois) IEMA Region 7



Jurisdiction:	# of Acquisitions		
1- Clinton – 1025,1188	(57)	4- Villa Grove- 1025,1112	(15)
2- Champaign County – 1025	(1)	5- Danville- 1025	(23)
3- Sidney – 1188	(10)	6- Woodford County- 1800	(14)
		Total:	**(120)**

Illinois Floodplain Mitigation Projects
(Southwest Illinois) IEMA Region 8



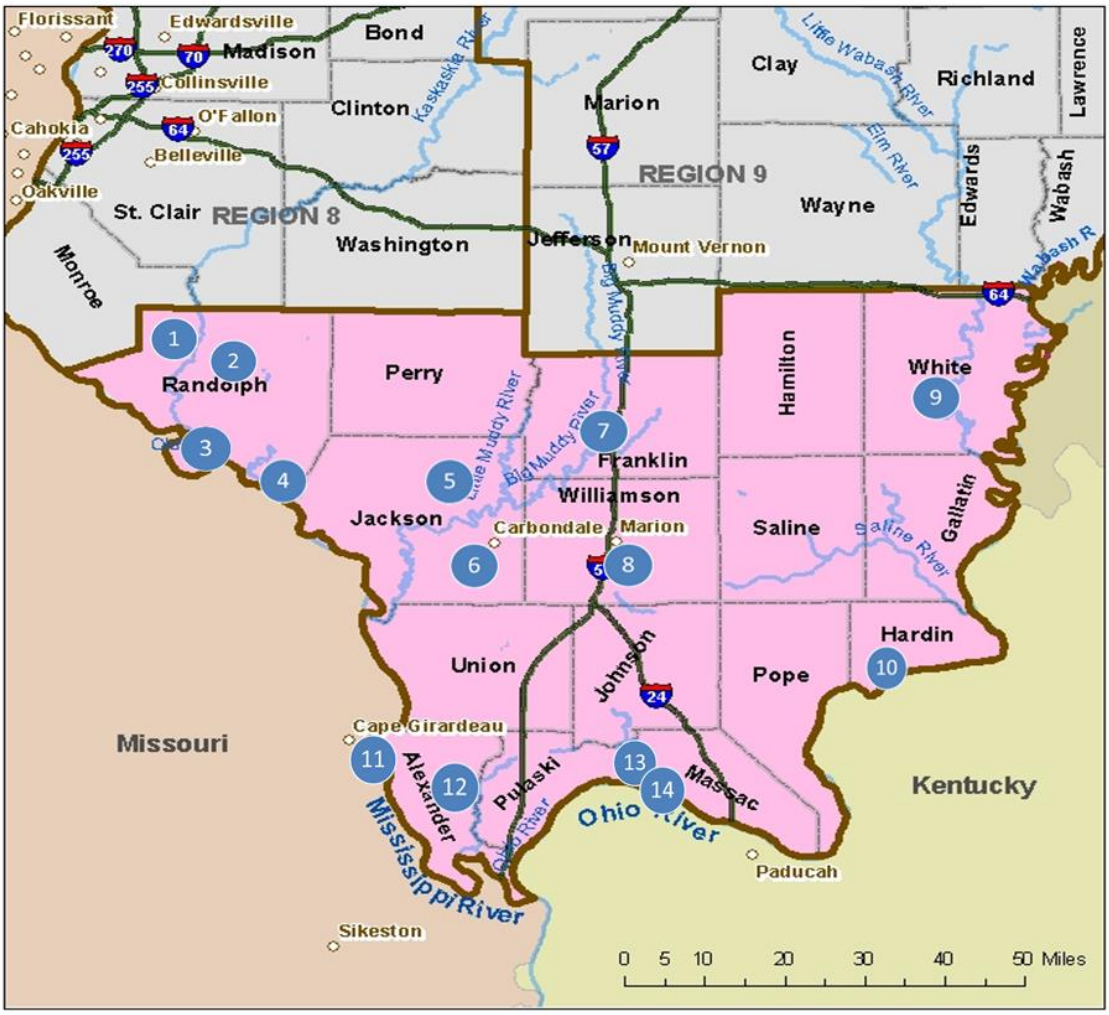
Jurisdiction:	# of Acquisitions				
1- Hillview – 997	(15)	7- Jersey County- 997	(94)	13- Belleville- 1053,1112,1188	(54)
2- Green County – 997	(57)	8- Grafton- 997	(111)	14- St. Clair County- 1025,1053	(259)
3- Kampsville – 997	(14)	9- Elsah- 997	(2)	15- Valmeyer- 997	(244)
4- Hamburg – 997	(3)	10- East Alton- 1513	(2)	16- Monroe County- 997	(136)
5- Calhoun County – 997	(75)	11- Madison County- 997	(39)	17- Fults- 997	(25)
6- Hardin – 997	(43)	12- East St. Louis- 997,1053	(612)	**Total:**	**(1785)**

Illinois Floodplain Mitigation Projects
(South East Illinois) IEMA Region 9

Jurisdiction:	# of Acquisitions
1- Birds – 1112	(50)

Total: (50)

Illinois Floodplain Mitigation Projects
(South Central Illinois) IEMA Region 11



Jurisdiction:	# of Acquisitions				
1- Evansville – 997	(18)	6- Carbondale-PI	(1)	11- Thebes-997	(1)
2- Randolph County – 997	(24)	7- West Frankfort-1112	(31)	12- Alexander County-1935	(150)
3- Kaskaskia – 997	(6)	8- Marion-1112	(46)	13- Joppa-1170	(6)
4- Rockwood – 997	(3)	9- Carmi-1112,1188	(37)	14- Metropolis-1935	(11)
5- Reed Station– 1935	(48)	10- Elizabeth Town-1170	(2)	**Total:**	**(384)**

Prioritizing Mitigation Action Items

The INHMP contains mitigation action items that were evaluated and prioritized by the Illinois Natural Hazard Mitigation Planning Committee or the State Hazard Mitigation Officer in order to identify actions to conduct over the life of the plan and beyond. These mitigation actions were developed by assessing the State's existing authorities, policies, programs, and resources while examining our capability to utilize existing programs and resources to reduce losses and vulnerability from the summarized hazards in the plan. The action items were prioritization utilizing the STAPLEE method. A detailed description of the method maybe found in Section V of the INHMP. Factors in the prioritization of the action items included: cost-effectiveness, environmental considerations, technical feasibility, legality, political support, social acceptability and administrative elements such as funding and staffing availability.

The INHMP has incorporated the local mitigation actions and goals into the planning process to ensure that the IHMHP Mitigation Strategy remains consistent and supports the mitigation efforts of the State's local entities. The INHMP does not identify nor prioritize site-specific mitigation projects, but engages a strategic approach that incorporates goals, strategies and actions that support the specific mitigation actions identified by the local hazard mitigation plans.

In 2010, IEMA began work on a project and mitigation action tracking database. The development of this database was suspended for approximately 2 ½ years due to funding and staffing limitations. However, in 2013 the construction of this database was re-instituted. IEMA will partner with the Illinois State Water Survey in an effort to populate and update this database. In accordance with the State mitigation strategy, IEMA has continued to monitor approved local plans. This section of the State Hazard Mitigation Plan will address the issue of identification and evaluation of cost-effective and technically feasible hazard mitigation projects and initiatives. All hazard mitigation projects within the State are designed to mitigate the effects of disasters in reference to one or more of the following six

categories:

- Prevention: Actions intended to keep a hazard risk problem from getting worse.
- Property Protection: Actions used to modify buildings subject to a hazard risk, or their surroundings, rather than to prevent the hazard from occurring.
- Public Education and Awareness: Actions that inform and remind people about hazardous areas and the actions necessary to avoid potential damage and injury.
- Natural Resource Protection: Actions intended to reduce the intensity of hazard effects as well as to improve the quality of the environment and wildlife habitats.
- Critical Facilities Protection: Effort to protect buildings that are vital to the public safety needs within jurisdictions.
- Structural Projects: Actions that involve construction of manmade structures to control hazards; i.e. dams, levees, dikes, and seawalls.

This mitigation action tracking database has been completed and entry of approved mitigation action items for all jurisdictions with FEMA approved mitigation plans are continuing. There are currently over 893 projects entered into the system. The database is continually being updated with new approved plans. This database will allow mitigation staff to track projects currently under construction in Illinois as well as revisit completed projects for success stories. The initial intent was to have each local jurisdiction that submits a plan fill out the tracking document and submit it with the crosswalks so that we can integrate it into our statewide document. However, this document has not been successfully implemented. A basic template is on the next page. Because this is a database it is not easily shared in this plan, screen shots are provided later in this chapter. Once all FEMA approved local mitigation plan action items have been entered into the database, it will be hosted on the IEMA website for all to view and access. This type of public access will allow for all jurisdictions to query different types of mitigation actions in an effort to broaden their own jurisdictions strategies.

When mitigation projects are proposed, an initial review of the project application is conducted by the IMAG-SC to ensure that the project is eligible and meets the federal requirements for the requested grant program. The project applications are then evaluated utilizing a set of criteria that reflect the State's priorities, so non-structural projects such as acquisitions, demolition, relocation, and policy enforcement

receive the most consideration for funding. A detailed set of criterion regarding mitigation project funding is described on page V-22 of the INHMP.

The State of Illinois mitigation staff and the INHMPC have initially identified and prioritized the following programs as being the most beneficial actions to achieve the overall goals of the INHMP:

1) **Enforcement of State planning and regulatory efforts**

Continued enforcement of State regulatory efforts is one of the top priorities of the Sate of Illinois as related to mitigation. Enforcement and creation of strong regulations including floodplain ordinances, zoning and building codes are a cost effective approach to mitigating the future impact of hazards. All can be adopted, developed, maintained and enforced at the local level, with little to no cost. The State continues to promote compliance with state planning and regulatory efforts such as: National Flood Insurance Program (NFIP) regulations, Executive Order Number 5, Executive Order Number 2, CDB Act and various acts outlined in the Illinois Compiles Statutes. On-going hazard mitigation programs are coordinated with the State's efforts to coordinate and promote compliance with these regulations and planning efforts. The State has been very successful in past years regarding the enforcement of such regulations. The IDNR/OWR ensures that jurisdictions participating in the NFIP enforce the regulations. By preventing new structures from being built in the floodplain it greatly reduces the people and property at risk. Illinois is ranked #5 in the nation for total number of participating communities. 825 of approximately 1,000 communities in Illinois have adopted local floodplain regulations and joined the NFIP.

2) **Acquisition of substantially damaged structures.** Acquisition of substantially damage structures remain a top priority of the State of Illinois. Structures that are located in the floodplain of jurisdictions participating in the NFIP that receive damages that exceed 50% of the value of the structure are considered "substantially damaged". The structure must either be demolished or built above the base flood elevation. This degree of loss and

the potential additional expense of coming into compliance make it an economic disaster for the flood victims. By acquiring the property for pre-flood fair market value we can ease the economic suffering of the disaster victims and eliminate the impact of future flooding hazards regarding those structures. Illinois has purchased nearly 3,500 flood prone properties since 1993. More than $80 million in Federal mitigation funds and $25 million in state matching funds have been utilized to achieve this accomplishment.

3) **Acquisition of repetitive loss properties**. This works hand in hand with enforcement of the NFIP rules and the acquisition of substantially damaged properties to break the cycle of construction/destruction/reconstruction. Those homes or businesses, which have had two or more claim payments of more than $1,000 from the National Flood Insurance Program within any rolling 10-year period are considered a Repetitive Loss (RL) structure. Acquiring repetitive loss structures provides an opportunity to mitigate future losses to these properties. Priority will be given to those projects requesting acquisition of Severe Repetitive Loss Properties. A SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- That has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
- For both (a) and (b) above, at least two of the referenced claims must have occurred within any ten-year period, and must be greater than 10 days apart.

Illinois has been very successful in reducing the number of repetitive loss properties. Since 1995, Illinois has dropped from 5th in the nation with 3,518 properties to 21st, with 1,465 properties. These projects have been as expansive as acquiring most of the structures in a town, Valmeyer, down to as simple as removing a single family home.

4) **Small Structural Projects**

Small structural projects have recently become a priority to reduce flood risks in Illinois. These small structural projects may include: storm water detention projects, reservoirs, floodwalls and channel improvements. Structural flood control measures constructed in Illinois are estimated to provide over $4.2 billion in flood damage reduction benefits. In the northeast Illinois area alone, structural flood control projects have provided approximately 25,000 acre-feet of flood storage, and include 30 miles of channel improvements.

5) **Construction and Retrofitting**

Projects directly related to the retrofitting of critical/essential facilities or Code Plus construction projects related to wind-resistant and seismic mitigation remain one of the State's priorities. Shelter construction is a relevant mitigation project, with priority being given to projects proposed for critical or essential facilities such as schools, hospitals, and nursing homes.

6) **Education and Public Outreach**

Education and Public Outreach are essential to the mitigation process. With limited funding not all mitigation projects such as a variety of construction projects, acquisitions or warning systems can be funded through federal or state grants. Educating the public of mitigation techniques and low cost projects allows for additional avenues to help limit the impact of specific hazards. The State of Illinois continues to place education and public outreach as a top priority in relation to the mitigating the hazards in Illinois. The unique mitigation opportunity that education and public outreach provides is that it can address a larger number of the identified hazards and impact a larger population base then other mitigation projects. These efforts continue to be a collective effort by all State agencies represented on the INHMPC. Educational opportunities have been provided in recent years regarding wind-resistance construction, earthquakes, flooding and severe weather. Manuals and videos have been developed to explain mitigation construction techniques. These materials were distributed to public libraries in the State and to interested people

around the country; these manuals and videos continue to be distributed to interested parties. In addition, wind-resistant construction workshops and seismic mitigation courses have been held. The FEMA P-909 Home and Business Earthquake Safety and Mitigation (Train-the Trainer) course and the FEMA E-74 Reducing the Risks of Nonstructural Earthquake Damage were conducted with, the intent to train a cadre of instructors to reach a larger population base. A website has been created specifically for seismic education for the general public. In addition an education DVD was developed by Southern Illinois University and distributed regarding seismic retrofitting and additional mitigation activities.

B. Illinois Mitigation Capability Assessment

The State of Illinois has the legal authority to engage in pre- and post- disaster mitigation activities. The State of Illinois has put together a group of agencies known as IMAG, Illinois Mitigation Advisory Group. This group is comprised of state agencies, federal departments, academia, business and industry and private nonprofit organizations. The task of this group is to provide suggestions and provide technical guidance regarding mitigation policies, best methods and procedures to their respective and related organizations in the State. In Illinois, this group is the primary mitigation resource. In the pre-disaster setting all of the strategy and policy decision making occurs. Depending on the scenario, in the post-disaster setting IMAG functions as a response group on an as needed basis. This group functions not in the initial sense of first responders, but nevertheless in a planned deliberate response to solve the post-disaster mitigation concerns. The integration of mitigation with recovery efforts has always been and is a priority in Illinois. This allows for maximum flexibility to provide whatever resources are currently required.

The State has several funding programs in place which are available to local jurisdictions. These funds are primarily from various Federal grant programs. Currently, the State uses the FEMA programs of HMGP, FMA, PDM and the HUD program of Community Development Block Grants (CDBG) funds to promote mitigation activities. The State supplements these sources with funding from the Flood Hazard Mitigation Program from the Illinois Department of Natural Resources/Office of Water Resources. This program is funded with Capital Bond Funds and the amount varies from year-to-year depending on the appropriation of the legislature. The Program occasionally receives special appropriations from the legislature (Build

Illinois, Illinois First). These funds must be used for the purchase of real property (not mobile homes) in the floodplain.

The State of Illinois has invested a significant commitment to emergency management and public safety. Representatives from a variety of State agencies are involved in numerous planning efforts regarding all phases of emergency management including: Prevention, Mitigation, Response and Recover. This integration and commitment has resulted in the development of a number of fundamental programs, regulations, plans and policies that strengthen the State's hazard management capabilities. These plans, regulations, programs and policies were reviewed during the INHMP update process in an effort to identify their effectiveness and potential for further mitigation initiatives. The State's mitigation planning efforts have been integrated into the following State planning programs and initiatives.

Planning Efforts	Description
Illinois Emergency Operation Plan (IEOP)	The IEOP was developed in cooperation with the Office of the Governor, executive departments and agencies, the Illinois Terrorism Task Force and the American Red Cross. The IEOP describes the Illinois Disaster management System (IDMS), which conforms to the national incident Management System (NIMS). The IDMS will be used by all State of Illinosi government agencies when the IEOP is implemented for response or recovery operation in any part of the state affected by a major emergency or disaster.
Illinois Recovery Plan	The Recovery Plan facilitates the delivery of state assistance to support citizens and local governments and private industry as they deal with the recovery from a major disaster. It is designed to supplement and support local recovery efforts and it describes how state agencies coordinate and facilitate the delivery of federal disaster assistance programs. The plan includes annexes such as: Damage Assessment, Supplemental Federal Disaster Assistance, Individual Assistance, Public Assistance and Mitigation Assistance.
Catastrophic Earthquake Annex	The Earthquake Annex outlines operational command, coordination, communication, and control for counties and responsible agencies/organizations following a catastrophic earthquake. It is used in conjunction with a jurisdiction's Emergency Operations Plan.
Food and Water Distribution Plan	This document provides operational guidance and serves as a concept of operations for jurisdictions undertaking missions for the distribution of food and water to the public following a disaster where public facilities for potable water and/or food preparation and supply are inoperable or incapable of meeting the public's essential needs.

Resource Management Planning	Resource management is the cornerstone of effective response and recovery. A comprehensive resource management system provides jurisdictions with a pre-identified structure for assigning resources and carrying out critical missions that support life safety and life essential services.
Strategic Operations Planning	Strategic Operations of Emergency Management provides executive and senior level local emergency management staff with practices designed to outline efficiencies and priorities prior to, during, and after disaster strikes. Strategic Operations of Emergency Management explores and expands on interlocking strategies for emergency operations centers and incident command structures; development and implementation of straight-line information pathways; lateral and vertical coupling of critical sectors and emergency response roles; analysis of critical and priority information requirements; determination of centers of gravity for objectives driven task assignment; execution of strategic priorities against defined resourcing elements; and the incorporation of deliberate decision and/or trigger points for strategic emergency management.
Continuity of Operations Plan (COOP)	COOP ensures continuity of essential department or agency functions/services in spite of an emergency or disaster. The COOP is implemented when a building or facility is rendered inoperable for a period greater than 30 days, during which time services to public and private stakeholders must be continued.
Illinois Threat Hazard Identification Assessment (THIRA)	The Threat and Hazard Identification and Risk Assessment (THIRA) process standardizes the risk analysis process that emergency managers and homeland security professionals use every day through the normal course of their work. The THIRA process builds on existing local, state, tribal, territorial Hazard Identification and Risk Assessments (HIRAs) by: • Broadening the threats and hazards considered to include human-caused threats and technological hazards. • Incorporating the whole community into the planning process, including: individuals, families, businesses, faith-based and community organizations, nonprofit groups, schools and academia, media outlets and all levels of government, including local, state, tribal, territorial and federal partners. • Providing increased flexibility to account for community-specific factors. The THIRA process helps communities identify capability targets and resource requirements necessary to address anticipated and unanticipated risks.
Illinois Drought Preparedness and Response Plan	The goal of the plan is to assist community and state officials and the public with information and tools that promote better decision-making in water supply planning and reduce drought-related impacts, water completion, and conflict of use. The drought plan provides state agencies, communities, and the public with a resource to stay updated on water supply issues, drought actions, and key consideration communities should make for drought preparedness.

Laws and Regulations

The mitigation strategies outlined in the INHMP continue to be integrated into State planning and regulatory efforts in a continued effort to improve the mitigation process in Illinois. The State of Illinois has enacted a number of laws, regulations and acts impacting local governments that have an impact on mitigation. The majority of these legislative actions have been enacted to provide legal authority and guidance for both state and local governments. The primary laws, regulations, programs and policies that have an impact on mitigation programs in Illinois are listed below.

Illinois Constitution

Section 6 of Article XVII of the Illinois Constitution designates Illinois as a home-rule state. This amendment to the state constitution grants cities, municipalities, and counties the ability to pass laws to govern themselves as they see fit, as long as implemented laws obey the state and federal constitutions.

Illinois Administrative Code

The Illinois Administrative Code is a codification of the rules of the administrative agencies of the state. These rules are reviewed by the Joint Committee on Administrative Rules (JCAR), which is a bipartisan legislative oversight committee created by the General Assembly in 1977. Pursuant to the Illinois Administrative Procedure Act, the committee is authorized to conduct systematic reviews of administrative rules promulgated by State agencies. JCAR conducts several integrated review programs, including a review program for proposed, emergency and peremptory rulemaking, a review of new Public Acts and a complaint review program.

JCAR is composed of 12 legislators who are appointed by the legislative leadership, with the membership apportioned equally between the two houses and the two political parties. It is co-chaired by 2 members representing each party and each legislative house. Support services for the committee are provided by the JCAR staff. Two purposes of JCAR are to ensure that the General Assembly is adequately informed of how laws are implemented through agency rulemaking and to facilitate public understanding of rules and regulations.

(20 ILCS 3305) Illinois Emergency Management Agency Act: This act not only outlines the responsibilities and actions performed by the State of Illinois during, before and after a disaster but also provides legal authority and guidance to "local political subdivisions" i.e. Local governments on emergency management issues. In chapter 127 paragraph 1060, the IEMA Act authorizes and guides local governments to establish "Emergency Service and Disaster Agencies (ESDA)" in their perspective jurisdictions. Paragraph 1061, provides the legal authority for local governments regarding local disaster declarations. Mutual Aid requirements and guidelines are discusses in Chapter 127 paragraph 1063 for local governments.

(50 ILCS 752) Illinois Public Safety Agency Network Act: This act promotes intergovernmental cooperation between public safety agencies of local government, i.e. Sheriff, Fire, and Police. It also promotes interoperability among all public safety disciplines.

(50 ILCS 805 Section 4) Land Resource Management Planning Act: It is the purpose of this Act to encourage municipalities and counties to protect the land, air, water, natural resources and environment of the State and to encourage the use of such resources in a manner which is socially and economically desirable through the adoption of joint or compatible Local Land Resource Management Plans. Such plans may include goals and procedures to identify, document, publicize, and establish the best safe usage for land subject to natural disasters and hazards, including flooding. In addition, the act also allows for the develop and maintenance of data on existing social, economic and physical conditions including analysis of municipal needs, and demographic projections to provide current information for decisions and action. (Source: P.A. 84-865.)

(765 ILCS 77/) Residential Real Property Disclosure Act

This Act requires a seller to tell a potential to advise the potential buyer, if they are aware of any basement flooding, if the property is in the floodplain, or if the seller has flood insurance.

(425 ILCS 25/9 Section 9) Fire Investigation Act

This Act enables the State Fire Marshal to make, or cause to be made, inspections of buildings, structures and premises to determine their conformity with the provisions in this Act and their safety to life and property from fire or other emergency requiring evacuation of the building (such as presence of explosive or flammable gasses, fume hazard, and power failure).

(50 ILCS 815 Section 2) Flood Damage Prevention Act: This act enables local governments to issue building permits in the relation to infrastructure for runoff water. Any county or municipality may, by ordinance, adopt requirements that all applications for building permits contain a statement that such buildings and appurtenances connected therewith include facilities for the orderly runoff or retention of rain and melting snow. Such facilities may include, but not be limited to: retention ponds, retention tanks, pools located on and a part of the roof of buildings, permeable pavements and such other facilities as may be suitable. Such plans shall include a signed statement issued by a licensed civil engineer that the plans include facilities adequate to prevent harmful runoff. The governing body of the county or municipality shall determine rain and snowfalls taking into consideration such factors as the permeability and water absorbing quality of the soil and adequacy of existing water-ways. (Source: P. A. 78-400.)

(210 ILCS 120/) Illinois Mobile Home Tie down Act (from Ch. 111 1/2, par. 4405)

Section 5 of the Illinois Mobile Home Tie down Act indicates that the owner of each mobile home installed in Illinois on or after January 1, 1980, or which is moved from one lot to another after that date, shall be responsible to insure that approved tied own equipment is obtained and used to secure the mobile home to the surface upon which it is to rest when occupied. After January 1, 1990, the owner of each mobile home park shall make available to the owner of any mobile home moved within or into their mobile home park with a copy of the Mobile Home Owner's Tie down Guide pamphlet prepared by the Department. This pamphlet shall be made available to the homeowner prior to the installation of the home. The Department shall be responsible for providing these pamphlets to each mobile home park owner. The installer of such equipment shall secure the mobile home in accordance with this Act and all rules and regulations promulgated under the authority of this Act.

(Source: P.A. 86-595.)

Coastal Management Program

The Illinois Department of Natural Resources/Office of Coastal Management was officially approved as a program of NOAA in January 2012, as part of the Coastal Zone Management Act. The goals of the program are to preserve, protect, restore, and where possible, enhance coastal resources in Illinois for this and succeeding generations. The program will also work to support and coordinate partnerships among local, state and federal agencies and organizations for coastal planning and management and strengthen local stakeholder capacity to initiate and continue effective coastal management consistent with identified state standards and criteria.

The program intends to work with Federal, state and local partners to identify coastal hazards, including erosion, water level changes, storm surges, flooding and potential climate change issues with the goal of increasing long-term coastal resilience to mitigate those hazards. The Illinois Coastal Management Program can offer technical support, coordination, data and monitoring, and funding for projects that help mitigate coastal natural hazards.

School Safety Drill Act (PA 094-0600)

Develop, maintain and administer the minimum standards for 876 Illinois public school districts (includes Chicago Public Schools) to follow when conducting school safety drills and the minimum standards for reviewing school emergency and crisis response plans, and the standards and procedures for ensuring compliance with the minimum standards.

School Safety Drill Act Administration Title 29 Part 1500

Joint Rules of the Office of the State Fire Marshal and the Illinois State Board of Education: School Emergency and Crisis Response. The Act establishes the requirements for the annual review and updating of the protocols and procedures in each school's emergency and crisis response plan.

State Policy Regarding Development

Legislation/Order	Description	Effective Date
Executive Order Number 5	State agencies engaged in development must follow rules in accordance with the NFIP.	2006
CDB Act Amended By SB 138	Provides a model building code for all areas throughout the State that currently have no code. The bill provides minimum code(s) for commercial construction.	2010
Executive Order Number 2	Ensures appropriate seismic design for state agencies engaged in development.	1990

In Illinois much of the legal enforcement powers are decentralized and lie within the local jurisdictions. Illinois is a "home-rule" State. This results in the lack of uniformity from one jurisdiction to the next. Examples are as follows:

1) Each jurisdiction must enforce its own zoning rules and regulations which includes floodplain management. The State cannot enforce these regulations; it is up to the local jurisdiction.

2) Each jurisdiction chooses whether or not to adopt building codes and is responsible for enforcing building codes. Generally, the State of Illinois has not adopted a statewide building code. The exception is that for Illinois public school districts, excluding Chicago Public Schools, Illinois has adopted a statewide building code.

State Floodplain Management

The Illinois Department of Natural Resources/Office of Water Resources coordinates the NFIP and works with communities to adopt and enforce local floodplain regulations. In Illinois, 88 counties and 820 communities have adopted local floodplain management ordinances and participate in the National Flood Insurance Program. Virtually all communities in Illinois have adopted the state model floodplain ordinance. The state model ordinance has several regulations which go above-and-beyond NFIP minimum standards. Communities in the six counties of Northeastern Illinois go even further. These communities require compensatory storage for any floodplain development and enforce strict "appropriate use" regulations within the floodway. Many Illinois local officials are Certified Floodplain Managers (CFMs). As a result, Illinois has the fewest number of flood claims on new buildings. Few (if any) states in the nation regulate floodplain development as ardently as Illinois. The Illinois Department of Natural

Resources/Office of Water Resources has developed a model ordinance for floodplain management, which provides the minimum requirements an NFIP participating jurisdiction must enforce. This model encourages community development outside of the floodplain and assists in managing the current floodplain. It requires a State permit for any construction in the floodway. Some jurisdictions have chosen to exceed the requirements of the model ordinance and have adopted more restrictive ordinances. This is most common in the Chicago metro area.

Executive Order Number 5 (2006)

Construction Activities in Special Flood Hazard Areas

All State Agencies engaged in any development within a Special Flood Hazard Area shall undertake such development in accordance with the following:

A. All development shall comply with all requirements of the National Flood Insurance Program (44 C.F.R. 59-79) and with all requirements of 92 Illinois Administrative Code Part 700 or 92 Illinois Administrative Code Part 708, whichever is applicable.

B. In additional to the requirements set forth in preceding Section A, the following additional requirements shall apply where applicable:

1. All new Critical Facilities shall be located outside of the floodplain. Where this is not practicable, Critical Facilities shall be developed with the lowest floor elevation equal to or greater than the 500-year frequency flood elevation or structurally dry flood proofed to at least the 500-year frequency flood elevation.
2. All new buildings shall be developed with the lowest floor elevation equal to or greater than the Flood Protection Elevation or structurally dry flood proofed to at least the Flood Protection Elevation.
3. Modifications, additions, repairs or replacement of existing structures may be allowed so long as the new development does not increase the floor area of the existing structure by more than twenty (20) percent or increase the market value of the structure by fifty (50) percent, and does not obstruct flood flows. Flood proofing activities are permitted and encouraged, but must comply with the requirements noted above.

Rivers, Lakes and Streams Act, 615 ILCS 5 (Dam Safety Program)

Pursuant to the Rivers, Lakes and Streams Act, 615 ILCS 5 (1996 State Bar Edition), the Illinois Department of Natural Resources, Division of Resource Management regulates the construction, operation and maintenance of new dams and the modification, operation and maintenance of existing dams. Dams are classified by the Division based on hazard potential into one of three hazard classifications. All dams in the two higher classifications are required to have a permit under Dam Safety rules promulgated by the Department. Dams in the lower hazard classification require a permit for construction or modification if they meet certain size criteria. Dams in the lower classification may qualify for authorization under General Permit 98-01 or General Permit 02-01.

The Capital Development Board Act is amended by Senate Bill 138, which establishes a model building code for all areas throughout the State that currently have no code. The bill provides minimum code(s) for commercial construction. The bill provides for a qualified inspection of construction. Allows inspectors to be qualified by several different venues other than certification by a national code organization. Local jurisdictions may charge fees as local governments do now for building permits, etc. and they may enter into agreements with other local governments for these services and with third party providers for inspection services. The Capital Development Board's Division of Building Codes and Regulations (formerly the Illinois Building Commission) acts as an advisory body assigned the responsibility to assist in streamlining building requirements in Illinois. The Division primarily acts as an informational resource to be used by the various building industry elements, the general public and various governmental units.

(815 ILCS 670/) Illinois Residential Building Code Act

The purpose of this Act is to provide minimum requirements for safety and to safeguard property and the public welfare by regulating and controlling the design, construction, installation, and quality of materials of new residential construction as regulated by this Act.

(Source: P.A. 93-778, eff. 1-1-05.)

Executive Order Number 2 (1990)

Executive Order for the Reduction of Earthquake Hazards

Each State agency responsible for the design and construction of each new State building shall ensure that the building is designed and constructed in accord with appropriate seismic design and construction standards.

State Agency Programs & Policies

The State of Illinois has also enacted a variety of State agency policies and programs to assist in carrying out the mitigation actions pre and post disaster in an effort to achieve the State's mitigation goals. A variety of existing and emerging policies and programs were reviewed and evaluated as related to the mitigation program in Illinois. Members of the planning team have provided a capability assessment form to indicate their area of expertise. The following agency capability assessment forms are new to the 2013 INHMP Update: Illinois Department of Corrections, Illinois Commerce Commission, Illinois Environmental Protection Agency and the Illinois Department of Human Resources. Illinois' mitigation capabilities continue to increase year to year, as the benefits of strong mitigation measures are seen and new agencies are added to the mitigation planning efforts. Representatives from the following disciplines will be engaged in the future in an effort to strengthen updates and provide additional capabilities in areas currently not represented on the planning committee: University System, Electrical Cooperatives, Illinois Floodplain and Stormwater Management, Metropolitan Water Reclamation Districts, and Hazard Research Institutes (Mid-America Earthquake Center). Mitigation is a shared responsibility by all levels of government. All members of the INHMPC have essential roles that help the State achieve its mitigation efforts and reduce risk and impact as a whole from the identified natural hazards. The identified capabilities have been reviewed and determined to remain effective capabilities in assisting the State's mitigation program. The previously outlined regulations and policies incorporated with the State agency specific programs provide the final aspect of integration of the State's mitigation planning process. Each of these elements; regulations, policies and programs when combined together, provide the state with strong hazard management capabilities both pre and post disaster.

INHMPC members have provided Capability Assessment forms that provided greater detail related to the programs, plans, policies, regulations, funding and practices that their agencies have as related to mitigation in Illinois. These forms provide the agencies the availability to provide a brief description of each element and provide the opportunity to explore additional mitigation efforts that they may be able to engage in future years. The following capability assessment forms have been reviewed and updated to ensure that the most current capabilities are listed.

American Red Cross- ARC continues to be a strong ally and supporter of mitigation education programs. ARC's capabilities have not changed significantly, even though funding has been reduced.

Capital Development Board- CDB has retained all of the capabilities listed in previous plans. They have continued to update and revise the State's building code website available to all local agencies. In addition, initial discussions have begun to incorporate School Construction Grant administered by CDB with Code Plus Construction grants through HMGP, in order to maximize the construction of safe room's in schools.

Central Management Services- CMS current capabilities have not changed since the last update of the INHMP. Initial steps and discussions have begun to allow CMS to develop an all-encompassing GIS database for state owned or occupied facilities. CMS has agreed to manage and operate such a database when developed.

Department of Commerce and Economic Opportunity- DCEO continues to increase it's involvement with mitigation activities in Illinois. Their capability of assisting in providing a global match utilizing "IKE funds" has been a true asset allowing many jurisdictions' to further their mitigation projects.

Department of Insurance- IDOI capabilities remain consistent providing strong partnerships in the mitigation field with public outreach and education.

Department of Natural Resources- IDNR continues to be an essential partner in the mitigation efforts in Illinois. The agencies mitigation capabilities continue to become enhanced. Continued enforcement of the National Flood Insurance Program and local outreach regarding floodplain management continues to be an essential capability. In addition IDNR continues to update the State's floodplain maps and studies, while completing watershed and flood risk studies to develop structural and non-structural measures to reduce flooding impacts.

Department of Public Health- IDPH capabilities remain consistent providing an emphasis on public outreach and education for mitigation measures.

Department of Transportation- IDOT continues to provide a strong partnership with mitigation efforts in Illinois, focusing on structural projects related to mitigation. IDOT provides a unique capability of outreach to local highway departments or public works to identify potential mitigation projects. In addition, they have added the capability of a bridge scouring program, to identify and monitor high risk bridge locations, noted for scouring potential.

Emergency Services Management Association- IESMA continues to partner with IEMA to build a strong and trained cadre of emergency management professionals. IESMA is a direct link to local officials as related to mitigation activities.

Historic Preservation Agency- IHPA capacities regarding mitigation efforts for historic sites remains consistent with past plans and continues to improve, adding outreach programs and assisting in developing mitigation material as related to document storage.

State Board of Education- ISBE provides the unique opportunity to assist Illinois school districts and policymakers with mitigation efforts for the safety of our children. ISBE continues to work with IEMA to establish mitigation opportunities for Code Plus construction and public educational opportunities for mitigation.

State Geological Survey- ISGS provides the technical expertise capability regarding earthquake hazards and estimated impacts the State of Illinois.

State Water Survey- ISWS provides a variety of mitigation capabilities for Illinois. The State Climatologist provides technical expertise in climate conditions such as winter storms, heat, and drought. ISWS also provides technical expertise related to flooding research and information. ISWS provides the capability of a direct link to the ever expanding RiskMap research being conducted on specific watersheds in Illinois.

Nation Weather Service- NWS continues to provide capabilities that enhance Illinois mitigation efforts. Providing technical expertise regarding history and impact of past natural hazard occurrences allows the State to analyze and conduct planning related to mitigation. NWS also continues to provide the capability of public outreach and education for local jurisdiction as related to mitigation and planning efforts for severe weather.

Department of Human Services- IDHS provides a unique capability of providing assistance programs following a disaster potentially mitigating further impact on jurisdictions. IDHS was added new to the INHMPC in 2013.

Department of Correction- IDOC was incorporated into the INHMPC in 2013, to deliver the unique capability of providing technical guidance regarding mitigation measures directly related to correctional facilities.

Commerce Commission- ICC provides the capability of coordination and technical guidance regarding mitigation efforts for the State's critical infrastructure. ICC was introduced as a new planning member on the INHMPC in 2013.

Environmental Protection Agency- IEPA provides the capability of safeguarding environmental quality, consistent with the social and economic needs of the State, so as to protect health, welfare, property and the quality of life, through a number of regulations and policies.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **AMERICAN RED CROSS OF GREATER CHICAGO (ARCGC)**

POINT OF CONTACT: **Kevin Joyce, Chief Response Officer**

1293 Windam Parkway, Romeoville, Illinois

Phone Number: **(630) 378-0344** E-mail: **Kevin.Joyce@.redcross.org**

AGENCY MISSION/ FUNCTION:
The American Red Cross (ARC); a humanitarian organization led by volunteers and guided by its Congressional Charter and the Fundamental Principles of the International Red Cross movement. The ARC will provide relief to victims of disasters and help people prevent, prepare for and respond to emergencies.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Safe Home Illinois	X			American Red Cross of Greater Chicago (ARCGC) and IEMA partnership to mitigate wind damage effects in identified high-risk communities.
Team Fire Stopper	X			ARCGC program to reduce risk of residential and single family fires, as well as, prevent fires, in identified high-risk communities.
Masters of Disaster	X			Curriculum for grade school children to increase awareness of specific hazards with the intent of children sharing information with their families. Curriculum adaptable to fit hazard associated with particular communities.
Earthquake Seminar	X			ARCGC and IEMA partnership to bring awareness to the northeastern part of Illinois discussing effects of an earthquake that would result from fault lines in Southern part of Illinois and nearby (i.e. Missouri, Kentucky).

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **CAPITAL DEVELOPMENT BOARD, DIVISION OF BUILDING CODES AND REGULATIONS (CDB/DBCR)**

POINT OF CONTACT: Lisa Mattingly

Stratton Office Building 401 South Spring Street, 3rd Floor
Springfield, Illinois 62706

Phone Number **(217) 524-6408** E-mail Address: **lisa.mattingly@illinois.gov**

AGENCY MISSION/ FUNCTION:

The Capital Development Board (CDB) oversees the construction of new state facilities, such as prisons, college and university classroom buildings, mental health hospitals and state parks. In addition, CDB is responsible for renovation and rehabilitation projects at the State's 8,441 state-owned buildings containing more than 96 million square-feet of floor space.

The Capital Development Board's Division of Building Codes and Regulations (formerly the Illinois Building Commission) acts as an advisory body assigned to assist with streamlining building requirements in Illinois. The Division is an informational resource to governmental entities, designers, contractors and the general public. The Division has created a database of municipal and county adopted codes as required by statute.

They also publish the Directory of Illinois Building Related Requirements. This Directory provides contact information for all agencies involved in design and construction. The Directory and all services provided by the Division are available on the Commission's website, www.cdb.state.il.us.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Monitor Legislative and Regulatory issues related to Building Codes enforced in Illinois	X			Provide Administrative Rule and Legislative tracking and analysis specific to State construction requirements. Provide information on administrative rule process utilized by Illinois.
Support website that provides informational resources on building regulations in Illinois	X			Online access to reference documents regarding agency administrative rules related to building requirements. Legislative/administrative rule updates. Construction related resources.
Track new and amended building codes adopted by local municipalities and counties	X			Implemented program in 2000. Post new code adoptions or amendments to existing codes submitted by counties and municipalities. They are required to notify the division 30 days prior to adopting or amending an existing building code. Access by public for 60 days prior to being archived.
County/Municipality Code Identification	X			Division has established a database to identify codes and contact information for counties and municipalities in Illinois.
Designers for CDB projects are required to design new or reconstructed structures to meet IBC seismic requirements.	X			This helps limit damage in seismic event.
CDB has adopted policies to coincide with Executive Order 2006-05.	X			This includes but is not limited to the requirement that all critical facilities shall be located outside of floodplains. Where this is not practicable, the lowest floor elevation will be equal to or greater than the 500 yr. frequency or structurally dry flood proofed to that frequency. This can limit damages by avoiding areas where flooding may be present.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **CENTRAL MANAGEMENT SERVICES (CMS)**

POINT OF CONTACT: **Rick Tate**

719 Stratton Office Building 401 South Spring Street
Springfield, Illinois 62706

Phone Number **(217) 558-6587** E-mail Address **rick.tate@illinois.gov**

AGENCY MISSION/ FUNCTION:
Provide Property Management for over 700 state-owned and occupied buildings.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
No buildings in flood plains.	X			

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF COMMERCE AND ECONOMIC OPPORTUNITY (DCEO)**

POINT OF CONTACT: **Frankie Atwater**

620 East Adams, Springfield, IL 62701

Phone Number **(217) 558-4200** E-mail Address: **Frankie.Atwater@illinois.gov**

AGENCY MISSION/FUNCTION:
The Department of Commerce and Economic Opportunity is the lead state agency responsible for improving the competitiveness of Illinois in the global economy resulting in prosperous, growing industries, rising real income and high quality jobs. We, the DCEO Team provide information, assistance, and advocacy to facilitate and advance the economic development process in partnership with Illinois communities, business, and our network of public and private service providers.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (x)			Comments
	Support	Facilitate	Hinder	
Community Development Assistance Program	X	X		Requires 8-Step Flood Plain Review for all funded projects. Has an emergency component for public facilities repairs.
Dislocated Worker Program		X		Assists workers when major job loss occurs in a community.
Federal Grant Coordination		X		Assists communities in obtaining federal grants.
Public Infrastructure Program		X		Grants to communities to make infrastructure improvements.
Site, Building, and Community Profiles		X		Catalog of available business and industrial sites in Illinois.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF INSURANCE**

POINT OF CONTACT: **Mark Terry, Asst. Director of Consumer Education**

320 West Washington, Springfield, IL 62767

Phone Number **(217) 720-2278** E-mail Address **mark.terry@illinois.gov**

AGENCY MISSION/FUNCTION:
Our mission is to protect consumers by providing assistance and information, by efficiently regulating the insurance industry's market behavior and financial solvency, and by fostering a competitive insurance marketplace.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Public Outreach		X		The Illinois Department of Insurance (DOI) works to educate the general public about insurance issues before and after losses occur. The DOI makes these efforts through presentations at fairs, radio and television programming and town meetings and disaster sites.
Disaster Site Effort		X		The DOI establishes a presence at major disaster areas to inform and assist interested persons in: prevention of further loss, explaining the claims handling process, assistance with consumer questions, explaining insurance terminology and clauses in lay terms and helping to resolve issues between the public and insurance companies, when requested.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF NATURAL RESOURCES (IDNR)**

POINT OF CONTACT: **Joe Morelock**

One Natural Resources Way, Springfield, Illinois 62702-1271

Phone Number: **(217) 935-6860** E-mail Address: **Joe.morelock@illinois.gov**

AGENCY MISSION/FUNCTION:
IDNR's mission is to manage, protect, and sustain Illinois' natural & cultural resources; provide resource-compatible recreational opportunities; and promote natural resource-related public safety, education, and science.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Flood Hazard Mitigation Program		X		Provides funding and planning assistance in the purchasing of flood prone properties. Land purchased must remain in open space in perpetuity. Program can act alone or in conjunction with IEMA/FEMA. (POC = Paul Osman (217) 782-4428).
National Flood Insurance Program (NFIP)		X		Oversees compliance with local floodplain regulations. Works with communities to prepares and adopt local floodplain ordinances. Investigates and resolves floodplain violations. Provides technical floodplain management assistance. Coordinate associated CRS & ICC Projects (POC = Paul Osman (217) 782-4428).
Permitting Program	X			Program is responsible for issuing permits for construction in the floodway of streams and activities in & along public bodies of water. (POC= Mike Diedrichsen (217) 782-4426).
Dam Safety	X			Oversees the construction, operation, & maintenance of dams which existed prior to

				9-2-80. Dams are classified by size and hazard potential. (POC = Paul Mauer (217) 782-4427)
OSLAD	X			Open Space Lands Acquisition and Development Program provides funding assistance to local governments for the acquisition and/or development of land for public parks and open space. (POC = Jan Nation (217) 782-7607).
Mines & Minerals	X			Program provides information on location of underground mines in 73 IL counties. This information could be useful in determining risk as it relates to earthquakes.
Law Enforcement	X			Provides Law Enforcement activities in emergency situations related to natural disasters. (POC = Joe Morelock (217) 935-6860)
Flood Surveillance Program	X			Monitor flood stages throughout state and provide technical assistance to IMA concerning flood stages, flood forecasting and damages to urban & rural areas. (POC = Bill Milner (217) 524-1458)
Planning Studies (Flood-Control) Flood Control Act of 1945		X		Complete watershed and flood risk studies to develop structural & non-structural measures to reduce flooding and reduce or eliminate the number of damaged structures. (POC = Rick Gosch (217) 782-4732)
Floodplain Mapping		X		Coordinate State's floodplain maps and studies. (POC = Arlan Juhl (217) 785-3334).

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF PUBLIC HEALTH (IDPH)**

POINT OF CONTACT: **Winfred Rawls**

422 South 5th Street, Springfield, IL 62701

Phone Number **(217) 557-3699** E-mail Address: **Winfred.Rawls@illinois.gov**

AGENCY MISSION/FUNCTION:

IDPH's mission is to certify and/or regulate Local Health Departments, Hospitals, Long Term Care Facilities and Emergency Medical Services Assets.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X)			Comments
	Support	Facilitate	Hinder	
Office of Preparedness and Response	X			Collaborates with Local Health Departments, Hospitals and Emergency Medical Services to assess their disaster preparedness capabilities and assist with planning and training.
	X			Coordinates Emergency Medical Services (EMS) Assets to support any potential evacuations of Hospitals and Long Term Care Facilities.
		X		Coordinates potable water and portable toilets for local jurisdictions, upon request.
		X		Developed "Surviving Disasters A Citizen's Emergency Handbook".
Office of Health Care Regulation	X			Collaborates with IEMA at the Regional and State level to assist Hospitals and Long Term Care Facilities and their local EMA in providing relief supplies and any potential

				evacuations.
	X			Advises Hospitals and Long Term Care Facilities to coordinate with their local EMA for any supplies needed to assist response efforts.
	X			Hospitals and Long Term Care Facilities are advised to coordinate with their local EMA if evacuation of their facilities is required.
Office of Health Protection	X			Monitors operations of and resources from the Divisions of Infectious Diseases, Environmental Health, Food, Drugs and Dairies, and Laboratories collaborating with Local Health Departments as necessary and appropriate.
		X		Coordinates potable water and portable toilets for local jurisdictions, upon request.
		X		Assist in the development of “Surviving Disasters A Citizen’s Emergency Handbook”.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF TRANSPORTATION (IDOT)**

POINT OF CONTACT: **Thomas E. Korty**

2300 South Dirksen Parkway, Springfield, Illinois

Phone Number **(217) 524-0151** E-mail Address **Thomas.Korty@illinois.gov**

AGENCY MISSION/FUNCTION:
The mission of the Illinois Department of Transportation is to provide safe, cost effective, transportation for Illinois road ways that enhance quality of life, promote economic prosperity and demonstrate respect for our environment.

Bureau of Bridge and Structures

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Bridges over waterways are evaluated for their scour potential.		X		
Bridges with Critical Scour ratings are inspected after large storm events that produce high water condition.	X			
Bridges in seismically sensitive areas are inspected immediately after a significant earthquake event in accordance with the Earthquake	X			

Preparedness Plan. Bridges in seismically sensitive areas have been prioritized by their susceptibility to damage or collapse from seismic forces. Bridges with substructure elements in navigable waterways have been assessed for their susceptibility to barge collision and the condition of their protection devices.		X X		
				This process identifies bridges with critical scour potential and initiates mitigation through installation of countermeasures or justification for structure replacement. Provides inspectors and structural engineers with necessary data to determine if a structure is suitable to remain open to traffic. Provides inspectors and structural engineers with necessary data to determine if a structure is suitable to remain open to traffic. Provides Department planners with justification data in order to budget for repair, rehabilitation, or replacement of structures in seismic areas. Provides the Department with assurances that bridges with substructure elements in navigation channels are adequately protected from barge collision and justification for repair or replacement of damaged protection devices.

Bureau of Design and Environment

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Roadway crowns are required to be 3 feet over 50 year flood event high-water elevation.	X			This can reduce damage by preventing a design flood event from overtopping roadways.
Low beams of structures are required to be 2 feet above 50 year flood event high-water elevation.	X			This helps limit damage by preventing accumulation of debris which exacerbates flooding during design flood events.
Establishment of compensatory storage is required when regulatory floodplains are filled during the course of a project.	X			This helps prevent exacerbation of damage during flood events.
A Hydraulic Report is required for every structure rehabilitation or replacement project.	X			This helps to prevent damage by assuring adequate bridge opening to minimize flooding.
Drainage studies are required on all but the simplest projects, and explicitly address any flood hazards to users and adjoining properties.	X			This helps prevent damage by identifying and correcting any potential drainage problems during design.
Existing structures in seismically sensitive areas are studied for possible retrofits if the replacement is not indicated.	X			This helps limit damage in a seismic event.

Bureau of Design and Environment (Continued)

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
New or reconstructed structures in seismically sensitive areas are analyzed and designed to withstand seismic design loadings.	X			This helps limit damage in a seismic event.
Designers are required to coordinate with emergency services entities to assure accommodation throughout the project duration and beyond.	X			This will help limit damage by assuring the best practicable emergency response in the case of an event.
Interstate projects are coordinated with Department of Defense for the Strategic Highway Network(STRAH-NET) needs, particularly with respect to vertical clearances to structures.		X		This will help facilitate response in instances of domestic or foreign terrorism or other events requiring military capabilities.
The potential for geologic hazards such as mine subsidence, landslides and seismic activity is investigated and addressed on projects.	X			This can help to limit damages by identifying and avoiding or mitigating such hazards.

Bureau of Design and Environment (Continued)

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Crossing a flood plain with a new highway alignment is avoided unless there is no practical alternative, as directed by the U.S. Army Corps of Engineers	X			This can limit damages by avoiding areas where flooding may be prevalent.
Policy against crossing floodplains	X			Army Corps of Engineers to prevent flooding.
Minimize induced head for structures	X			Prevents structures from backing up streams and rivers.
Three feet freeboard on structures	X			Prevents accumulation of debris to help prevent flooding.
Pier placement in streams and rivers		X		Try to not place piers in the center of streams to hinder the flow of the streams.
Drainage studies	X			To make sure adequate drainage is on the project.

Bureau of Operations-Infrastructure Security Section

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Information Systems	X			Unit experienced in processing "Emergency Affidavits", Public Assistance Grants and Federal Highway Administration Grants to pay for emergency/disaster related response.
Communication Center Operations	X			Participation in user groups to study all types of operations to include winter operations (Multi-state runs meeting) and National /International Research Organization-Aurora
Bridge Recovery Program	X			Continue to implement the Bridge Recovery Program. This is the first in the nation. It established plans for structural evaluations and emergency response contracts to restore bridges to service as soon as possible following a natural or manmade disaster.
Bridge Security Program		X		Installation of over $10 million in surveillance equipment in Chicago, East St. Louis, LaSalle/Peru and other major Interstates. This equipment is used to secure bridges and highways from unauthorized access to critical infrastructure. Lighting, cameras, CCTV, fiber optics and fencing have been installed on 45 critical bridges in the State of Illinois.
		X		Installation completed on 42 manual gate systems on the inbound ramps on the Chicago expressway system. The gate system is to allow uninterrupted flow of emergency response vehicles into the City of Chicago while easing the burden of inbound traffic. Eighty locations have been selected for this program.

Bureau of Operations-Infrastructure Security Section (Continued)

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Evacuation Planning	X			The ITTF Transportation Committee in conjunction with the Illinois Terrorism Task Force prepared and tested evacuation plans for Chicago, Rockford, Peoria, Springfield and East St. Louis. Approximately $8 million in traffic management equipment has been provided to install traffic management equipment along streets and highways to insure free traffic flow from danger zones.
	X			The Transportation Committee Evacuation Implementation Group developed a Traffic Management Evacuation Plan for the City of Chicago Expressway. Priority routes have been selected to assist the evacuation planning of the Chicago Central Business District. Developing a Traffic Management Evacuation plan for the East St. Louis Metro area in coordination with SIU-E.

Bureau of Operations-Infrastructure Security Section

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Communication Center Operations		X		Staffed 24-hours a day to receive calls from Law Enforcement and other responder agencies to coordinate IDOT involvement and assistance for #1 safety events on IDOT highways -Incident reports -Maintain IDOT 800# for travelers alerting them of severe road conditions and closures on interstates.
		X		Communication Center "Liaisons" on call 24-hour, to respond to emergency disasters and SIRC activities. Communication center updates - winter road

	X			conditions map and road closure list as displayed on IDOT web page.
	X	X		Provide 800# for Motorist to report events and complaints.
	X			Contract funding for statewide weather forecasting provides warnings and forecasts to IDOT areas as well as selected pavement temperature forecasts.
	X			Refined study of equipment and their evaluation; yields enhanced equipment, better to respond in severe weather events. Experienced staff have pressed for more current fleet (truck) additions to ensure effective response to adverse events.
				Statewide radio systems and towers provide links between districts, trucks individually and control communications center.

Bureau of Operations-Maintenance Section

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Information Systems		X		Computer system support staff maintains road condition map as displayed on the internet.
		X		The MMIS Coordinator's for the Information System tracks dollars associated w/storm clean up.
	X			Roadway Weather Information System provides real-time pavement and atmosphere data at 53 locations statewide. (RWIS)
	X			A variety of performance and cost reports and salt reports to assist managers and budget staff.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS EMERGENCY MANAGEMENT AGENCY (IEMA)**

POINT OF CONTACT: **Ron Davis, State Hazard Mitigation Officer**

1035 Outer Park Drive, Springfield, Illinois 62704

Phone Number **(217) 524-1003** E-mail Address **Ron.Davis@illinois.gov**

AGENCY MISSION/FUNCTION:

AGENCY MISSION

To protect the State through integrated approaches of Emergency Management and Homeland Security that mitigate, prepare for, respond to and recover from all hazards, disasters and terrorist attacks.

SUMMARY OF AGENCY OPERATIONS

The primary responsibility of the Illinois Emergency Management Agency (IEMA) is to better prepare the State of Illinois in emergency management and Homeland security from any natural, manmade or technological disasters, hazards, or acts of terrorism. Through comprehensive emergency management, IEMA provides mitigation, preparedness, response and recovery. The Illinois Terrorism Task Force was established as a working partner within IEMA covering all disciplines and regions of the State, to facilitate the coordination of resources and the communication of information essential to combat terrorism. IEMA also provides monitoring of nuclear power plants; inspection and escorts of spent nuclear fuel shipments and all Highway Route Controlled Quantities (HRCQ) of radioactive materials; regulation of radon contractors, x-ray machines and technicians; licensing and inspection of radioactive materials.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Manages a hazard mitigation program	X			The mitigation staff's purpose is to promote mitigation statewide and to manage the FEMA mitigation programs for Illinois.
Participates in all Federal mitigation programs for which it is eligible	X			IEMA makes all attempts to use every mitigation dollar on eligible activities.
Encourages jurisdiction participation in NFIP	X			IEMA requires good standing as a prerequisite to mitigation funding. Joining the NFIP is viewed as the first step in mitigation.
Capability to track areas of repetitive flood loss and has developed a strategy to correct the problem	X			Illinois is a leader nationwide in identifying repetitive loss properties and has made their acquisition a top priority.
Develops a mitigation strategy based on the results of the hazard identification and risk assessment, program assessment, and operational experience to eliminate or mitigate the effects of hazards	X			The State's first priority is assisting the victims of disasters. The State Mitigation Plan is compiling local mitigation plans to identify the best projects.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Encourages and supports communities in becoming disaster resistant by providing them disaster prevention guidance, training, public education materials, technical assistance, and access to available Statewide resources	X			Mitigation projects are implemented by the local governments. All efforts are made to educate the local jurisdictions on mitigation options. IMA has focused on providing mitigation workshops following disasters while the interest is high.
Provides incentives that encourage mitigation activities sponsored by public and private sector partnerships	X			The mitigation staff has provided funding when possible to public/private sector partnerships. We have initiated a disaster resistant construction education program with the American Red Cross.
Considers but is not limited to use of appropriate building construction standards; hazard avoidance through appropriate land use practices; relocation, retrofitting, or removal of structures at risk; and removal or elimination of the hazard	X			IMA promotes mitigation prior to construction through proper land use planning. When structures are in harm's way we will work to remove them when it is cost-effective. We have provided funds for code-plus construction in schools and critical facilities.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Implements mitigation projects and/or initiatives with or without Federal grant assistance, according to a plan that sets priorities based on the highest potential for damage	X			IEMA's first priority is assisting the victims of disasters. Potential projects are analyzed to give priority to the avoidance of the greatest damage.
Provides policy leadership and coordination that promotes hazard mitigation programs and initiatives		X		The mitigation staff coordinates the IMAG, the INHMPC and the MCSC (formerly A&R).
Provides technical assistance to local governments in developing, adopting, and implementing state of the art building codes with all hazards mitigation components		X		Jurisdictions are directed to IBC for specific information on building codes. Manuals on wind resistant construction available on the IEMA website. Disaster Resistant construction materials are distributed to all interested parties.
Provides technical assistance to local governments in developing, adopting, and implementing land use ordinances for the purpose of reducing risks from all hazards	X			Jurisdictions are directed to IDNR/OWR for information on joining the NFIP. Mitigation staff answers basic questions on the NFIP but directs the complex questions to IDNR/OWR.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Provides technical assistance to local governments conducting hazard identification, vulnerability, and risk assessments	X			Mitigation staff is receiving train-the-trainer instruction in this area. HAZUS-MH is promoted as the tool of choice.
Provides technical assistance to local governments in developing and implementing mitigation plans	X			Local governments are provided with the FEMA planning guidance, IMA planning guidance and directed to the IMA website for information
Identifies mitigation opportunities during the development of the Disaster Survey Report/Project Worksheet	X			Mitigation staff accompanies PDA teams and looks for areas where future damages can be avoided.
Provides support to local jurisdictions that are building Disaster Resistant communities (e.g., Project Impact)	X			The mitigation staff provides technical assistance to any jurisdiction striving to be disaster resistant.
Tracks dollar savings due to mitigation efforts	X			When a disaster affects an area that has taken mitigation actions, an attempt is made to research and document the savings.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS EMERGENCY SERVICES MANAGEMENT ASSOCIATION (IESMA)**

POINT OF CONTACT: **Ryan Buckingham**
(Director of Franklin County EMA)
202 West Main Street, Benton, IL 62812

Phone Number: (618) 439-4362 Email Address: **ryan.buckingham@franklincountyema.com**

AGENCY MISSION/FUNCTION:

The Illinois Emergency Services Management Association broad objectives are to assist State and Local government to maintain an effective emergency services and disaster management program locally and statewide; to be a vital and effective element of our National Defense Program; and through research, educational and information programs, to advance the professional standards of individuals so engaged. Within these broad objectives, the Association has as its purposes:

- **To coordinate the efforts of its members in a common cause, to protect the lives and property of all persons within its territorial limits from enemy action or natural disaster, and to preserve our national security.**
- **To evaluate and disseminate the common experiences and collective judgment of the Local Emergency Management/ESDA organization and those other specialists trained in and responsible for Emergency Management activities.**
- **To serve as a clearing house for the collective experiences for Emergency Management activities, ideas and/or suggestions as well as successful course of action among our members and to make this material available to our members and agencies, both private and governmental.**
- **To provide opportunities for the members to keep abreast of the new developments and approved principles relating to Emergency Management and to encourage members to take advantage of these services.**

- **To act in concert with and in a professional advisory capacity to other organizations regarding Emergency Management/Preparedness matters.**

Through the Illinois Emergency Management Mutual Aid System (IEMMAS), we will provide qualified and educated personnel, upon request through the State Emergency Operations Center, to any stricken or afflicted body of government, be it local county state or federal. We currently have three regionally structured teams – Red (North), White (Central) and Blue (South) ready for deployment.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X)			Comments
	Support	Facilitate	Hinder	
Illinois Professional Standards and Accreditation Program	X			Education of the emergency manager's role in disaster planning to support mitigation.
Emergency Mobile Support Team (IEMMAS)	X			State resource of emergency management.
Incident Management Teams	X			State resource of Incident Management Teams in concert with MABAS, ILEAS and other agencies.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS HISTORIC PRESERVATION AGENCY (IHPA)**

POINT OF CONTACT: **Anne Haaker**

1 Old State Capitol Plaza, Springfield, Illinois 62701-1507

Phone Number **(217) 785-5027** E-mail Address **anne.haaker@illinois.gov**

AGENCY MISSION/FUNCTION:
Operates 60 historic sites and memorials. Administers all State and Federal historic preservation and incentive programs in Illinois.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
All historic sites have emergency procedures to remove materials in the event of a disaster.	X			IHPA does not have a policy on where items should be stored.
Preserves the historic nature of sites when they are preserved in place, rehabilitated or restored.			X	IHPA strives to protect the authenticity at their sites. At times this conflicts with mitigation.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS STATE BOARD OF EDUCATION (ISBE)**

POINT OF CONTACT: **Susan Weitekamp**

School Business and Support Services
100 North First Street, Springfield, Illinois 62777-0001

Phone Number **(217) 785-8779** E-mail Address **sweiteka@isbe.net**

AGENCY MISSION/ FUNCTION:

The Illinois State Board of Education provides leadership, advocacy, and support for the work of school districts, policymakers, and Illinois residents in making Illinois education Second to None. The State Board's vision is that Illinois public schools will enable all students to succeed in postsecondary education and career opportunities, to be effective life-long learners and to participate actively in our democracy.

Created in 1975, the nine-member board sets state educational policies and guidelines for schools, preschool through grade 12. In addition to providing leadership for Illinois education, the State Board of Education disburses and oversees more than $8 billion in state and federal funds annually, and administers a policy of equitable education opportunity for all children. The State Board's headquarters are in Springfield and Chicago.

As education leaders for Illinois, an essential part of the work of the State Board of Education is to assist schools and districts in building capacity for continuous improvement. At the core of every function and activity of the Illinois State Board of Education is the achievement of student learning outcomes measured against the Illinois Learning Standards.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Health Life Safety Code for Public Schools	X			Develop, maintain and administer the minimum standards for the maintenance and construction of public school facilities for 875 Illinois public school districts (excludes Chicago Public Schools), the minimum standards and guidelines for regional superintendents to use for ensuring compliance, the standards for qualifying individuals who conduct plan reviews and inspections of schools, and the standards for obtaining authorization to use and raise fire prevention and safety financing.
School Safety Drill Act PA 094-0600	X			Develop, maintain and administer the minimum standards for 876 Illinois public school districts (includes Chicago Public Schools) to follow when conducting school safety drills and the minimum standards for reviewing school emergency and crisis response plans, and the standards and procedures for ensuring compliance with the minimum standards.
School Construction Program	X			Develop, maintain and administer the standards for determining capacity need for 876 Illinois public school district (includes Chicago Public Schools), the standards for issuing entitlements to eligible school districts for school construction project grants, and the standards for determining the order of priority for projects based on the School Construction Law.
Non-public Recognition		X		Conduct health safety reviews as part of the Recognition Process. http://www.isbe.net /accountability/pdf/building_fire_safety.pdf

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
School Safety Drill Act Administration Title 29 Part 1500	X			Joint Rules of the Office of the State Fire Marshal and the Illinois State Board of Education: School Emergency and Crisis Response. Establishes the requirements for the annual review and updating of the protocols and procedures in each school's emergency and crisis response plan.
Superintendent's Weekly Message	X			Reminders and announcements for the agency are sent to school districts and regional superintendents through the "Superintendents Weekly Message". Recent topics regarding safety include the announcement of the Seventh Annual Safe School Symposium, Lightening Safety Awareness Week, availability of the online Incident Command System course, and Severe Weather Preparedness Week, etc. The weekly messages are then archived on our website at: http://www.isbe.net/board/archivemessages/message_022707.pdf.
School Security Training Program	X			A one day course on "Forming Critical Incident Response Teams" and a two-day "Train the Trainer" Multi-Hazard Emergency Planning For Illinois Schools" are offered free of charge to local law enforcement officers, firefighters, emergency management and public and private school districts. http://www.isbe.net/regionaloffices/pdf/multi_hazard_training_brochure.pdf
Hazardous Material Training	X			ISBE Accountability division checks for compliance with Hazmat training. (105 ILCS 5/10-20.17a) (from ch. 122, par. 10-20.17a) Sec. 10-20.17a Hazardous Materials Training. To enhance the safety of pupils and staff by providing in-service training programs on the safe handling and use of hazardous or toxic materials for personnel in the district who work with such materials on a regular basis. Such

				programs shall be approved by the State board of Education in consultation with the Illinois Dept. Of Public Health. (Source: P.A. 84-1294)

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS STATE GEOLOGICAL SURVEY (ISGS)**

POINT OF CONTACT: **Robert A. Bauer, Engineering Geologist**

615 E. Peabody Drive, Champaign, Illinois 61820

Phone Number **(217) 244-2394** E-mail Address **bauer@isgs.illinois.edu**

AGENCY MISSION/FUNCTION:
Providing the citizens and institutions of Illinois with a geoscience basis for environmental and economic decision making through relevant research, modern geologic mapping, targeted technical assistance, expanded education and outreach, and extensive databases and collections.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
CUSEC State Geologists' soil amplification and liquefaction susceptibility maps of 8 central U.S. States and some towns.	X	X		Maps that are produced for inclusion into HAZUS earthquake loss estimation. Eight states and Carbondale, Illinois
Groundwater contamination potential maps	X	X		Maps showing degrees of potential to contaminate groundwater in the State. State wide map and various areas where quadrangle mapping is occurring.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS STATE WATER SURVEY (ISWS)**

POINT OF CONTACT: **Mike Demissie, Director**

2204 Griffith Drive, Champaign, Illinois 61820-7495

Phone Number **(217) 244-5449** E-mail Address **demissie@illinois..edu**

AGENCY MISSION/FUNCTION:
The Illinois State Water Survey is the primary agency in Illinois for research and information on surface water, groundwater, and the atmosphere. Its mission is to characterize and evaluate the quality, quantity, and use of these resources. The mission is achieved through basic and applied research; by collecting, analyzing, archiving, and disseminating objective scientific and engineering data and information; and through service, education, and outreach programs. This information provides a sound technical basis for the citizens and policymakers of Illinois and the nation to make wise social, economic, and environmental decisions.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X)			Comments
	Support	Facilitate	Hinder	
State Climatologist Office	X	X		Monitor current climate conditions within the state and provides data and research on past climate hazards such as winter storms and drought.
	X			Produced the document *The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-supply Planning.*
Coordinated Hazard Identification and Mapping Program	X	X		FEMA Cooperating Technical Partner, conduct flood studies, prepare Digital Flood Insurance Rate Maps; and conduct HAZUS-MH analyses for mitigation planning; prepare Risk MAP non-regulatory products and outreach.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **NATIONAL WEATHER SERVICE (NWS)**

POINT OF CONTACT: **Chris Miller, Warning Coordination Meteorologist**

1362 State Route 10, Lincoln, IL 62656

Phone Number **(217) 732-4029 ext 726** E-mail Address **chris.miller@noaa.gov**

AGENCY MISSION/FUNCTION:

The mission of the National Weather Service is to provide weather and flood warnings, public forecasts, and advisories for all of the United States, its Territories, adjacent waters, and ocean areas, primarily for the protection of life and property.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
1. Storm Ready Program	X			The NWS Storm Ready program recognizes those communities that are prepared for natural disasters. The inspection process, prior to recognition, verifies that communities have the resources to receive weather information and warnings, the means to disseminate warnings to critical facilities, and that community preparedness activities have been accomplished and are on-going. StormReady recognition rewards local hazardous weather mitigation programs, helps emergency managers justify costs to support mitigation programs, provides a means of acquiring Community Rating System points assigned by the National Flood Insurance Program (NFIP), and provides an "image incentive" to communities.

2. Public Outreach		X		The NWS offices across the state of Illinois conduct numerous public outreach presentations at home shows, fairs, and for civic, religious, school and business groups. The main topics highlighted during this outreach are: - Hazardous weather safety & preparedness campaigns - The importance of NOAA Weather Radio and other weather information sources - Hazard mitigation projects for home owners, such as wind resistant construction and tornado safe rooms
3. Hazardous Weather and Flood Preparedness Course (FEMA G-271)		X		This course, intended for emergency managers and first responders, teaches a more proactive response to weather and flooding hazards through close coordination between emergency managers and the NWS. The course reviews the basic elements of weather hazards, the impacts these hazards may have on a community, and what emergency managers can do before, during and after an event to mitigate losses.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **ILLINOIS DEPARTMENT OF HUMAN SERVICES**

POINT OF CONTACT: **AMY DICKENSON-FERGUSON**
100 SOUTH GRAND AVENUE, EAST, HARRIS BUILDING II, SPRINGFIELD, IL 62762

Phone Number **(217) 557-9354**

E-mail Address
Amy.dickenson-ferguson@illinois.gov

AGENCY MISSION/ FUNCTION:

Provide description of agency mission/function.

IDHS's mission is to assist Illinois customers to achieve maximum self-sufficiency, independence and health through the provision of seamless, integrated services for individuals, families and communities.

Illinois created DHS in 1997, to provide Illinois residents with streamlined access to integrated services, especially those who are striving to move from welfare to work and economic independence, and others who face multiple challenges to self-sufficiency. Programs are provided based upon income eligibility.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X)			Comments
	Support	Facilitate	Hinder	
Disaster Supplemental Nutritional Assistance Program (D-SNAP)	x			The United State's Department of Agriculture (USDA) Food and Nutrition Service (FNS) authorizes disaster SNAP (formally food stamps) programs based upon federal and state disaster declarations and D-SNAP state application to the USDA. SNAP helps low-income people and families buy the food they need for good health. Benefits are provided on the Illinois Link Card - an electronic card that is accepted at most grocery stores.

Temporary Assistance for Needy Families (TANF)	x			The Temporary Assistance for Needy Families (TANF) program helps pregnant women and families with one or more dependent children with temporary cash and other benefits. TANF can help pay for food, shelter, utilities, and expenses other than medical.
Emergency Food Program (EFP)	x			The Emergency Food Program (EFP) provides food at no cost to help supplement the diets of needy low-income households. The EFP is a Federal program, administered by the Food and Nutrition Service (FNS) of the U.S. Department of Agriculture (USDA).
Woman, Infants, and Children (WIC)	x			WIC is a food assistance program for Women, Infants, and Children. It helps pregnant women, new mothers and young children eat well and stay healthy.
Supplemental Nutrition Assistance Program (SNAP)	x			The Supplemental Nutrition Assistance Program (SNAP) (formerly Food Stamps) helps low-income people and families buy the food they need for good health. Benefits are provided on the Illinois Link Card - an electronic card that is accepted at most grocery stores.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **Illinois Department of Corrections**

POINT OF CONTACT:

Brian Adams
1301 Concordia Court
Springfield, IL 62794-9277
(217)558-2200 ext. 5515
Brian.Adams@doc.illinois.gov

Lt. John Eilers
2500 Rt. 99 South
Mt. Sterling, IL 62353
(217)773-4441 ext. 580
John.Eilers@doc.illinois.gov

AGENCY MISSION/ FUNCTION:
The mission of the Illinois Department of Corrections is to protect the public from criminal offenders through a system of incarceration and supervision which securely segregates offenders from society, assures offenders of their constitutional rights and maintains programs to enhance the success of offenders' reentry into society. Safety is at the forefront of agency operations with an emphasis on frontline staff to protect and control inmates. Additionally, the agency has work camp and boot camp crews which provide thousands of hours each year toward community service projects and disaster relief efforts.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X)			Comments
	Support	Facilitate	Hinder	
IDOC Earthquake Response and Preparedness Plan	X			The purpose of this plan is to ensure that the Illinois Department of Corrections is prepared to establish communication links to the affected parts of the state, to provide rapid response, to provide quick assessment of damages, and to provide security to all affected Institutions following a significant earthquake. This plan specifically details response criteria for Vienna Correctional Center, Shawnee Correctional Center, Southwestern Illinois Correctional Center, Vandalia Correctional Center, Graham Correctional Center, Robinson Correctional Center, Dixon Springs IIP, Hardin County Work Camp, Southern Illinois ATC, Menard Correctional Center, Pinckneyville Correctional Center, Big Muddy River Correctional Center, Lawrence Correctional Center, Greene County Work Camp and the Centralia Correctional Center due to their inherent proximity to major

				known fault zones.
IDOC Mass Evacuation Plans	X			IDOC operates 26 adult correctional centers, 2 Impact Incarceration Programs (boot camps), 4 adult transition centers and 9 work camps. Each of these Facilities is required to maintain a Mass Evacuation Plan in the event their Facility is affected by a Natural Disaster (i.e. flood, tornado, wind storm, ice storm, earthquake, etc.), Terrorist Incident, Hazardous Material Spill, Fire, Pandemic Influenza, etc.
IDOC Pandemic Influenza Plan	X			Correctional institutions pose special risks and considerations due to the nature of their unique environment. Inmates are in mandatory custody and options are limited for isolation and removal of ill persons from the environment. The workforce must be maintained and options are limited for work alternatives (e.g., work from home, reduced or alternate schedules, etc.). In addition, many inmates and the workforce may have medical conditions that increase their risk of influenza-related complications. The focus of the Pandemic Influenza Plan is on general preventive measures for institutions, risk reduction of introduction of the virus into institutions, rapid detection of persons with novel influenza A (H1N1) infections, and management and isolation of identified cases. This Plan provides guidance specific for correctional facilities to ensure continuation of essential public services and protection of the health and safety of inmates, staff and visitors.

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **Illinois Commerce Commission (ICC)**

POINT OF CONTACT: **Bob Bensko**

527 E. Capital Avenue
Springfield, Illinois 62706

Phone Number **(217) 524-5049**

E-mail Address
Robert.Bensko@illinois.gov

AGENCY MISSION/ FUNCTION:
The ICC's mission is to pursue an appropriate balance between the interest of consumers and existing and emerging service providers to ensure the provision of adequate, efficient, reliable, safe and least-cost public utility services.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
(220 ILCS 30/) Electric Supplier Act	X			This Act was declares it to be in the public interest that, in order to avoid duplication of facilities and to minimize disputes between electric suppliers which may result in inconvenience and diminished efficiency in electric service to the public, any 2 or more electric suppliers may contract, subject to the approval of the Illinois Commerce Commission, as to the respective areas in which each supplier is to provide service.
Energy Engineering	X			Reviews: utility plant additions and "used and useful" issues in electric and gas rate cases; infrastructure construction certificates; ARES, ABC, MSP and AGS certification applications; ESA complaints; PGA and FAC reconciliations; electric distribution reliability reports; electric and gas meter calibration facilities; technical issues in consumer complaints; electric and gas accident reports; liquid petroleum pipeline facility certifications; and mercury rules compliance

				verifications.
9-1-1 Program	X			Provide technical standards and guidance to local governmental entities and 9-1-1 system providers regarding 9-1-1 operational issues, and develops policy proposals addressing current and future regulatory and legislative issues surrounding 9-1-1 infrastructure and public safety requirements of Illinois citizens.
Pipeline Safety	X			Inspects natural gas pipeline facilities to assure compliance with all Federal and State safety rules and regulations pertaining to the design, construction, operation and maintenance of those facilities, and incidents involving natural gas resulting in injury requiring hospitalization, fatalities or significant property damage.
Reliability Assessment	X			Provides analyses and policy advice regarding electric utility reliability reviews, power delivery infrastructure and distributed and renewable generation. Monitors investigations of power delivery infrastructure and environmental disclosure requirements. Provides representation on state and regional industry entities; and summaries and analyses as required on other issues as requested by the Division Director, the Executive Director and the Commission.
Water Engineering	X			Reviews tariffs and other fillings by public water and sewer utilities; provides expert testimony in litigated cases; performs field reviews and inspections of plant, facilities and operations; and reviews and recommends Commission policies on state and national-level water and sewer issues

ILLINOIS CAPABILITY ASSESSMENT

NAME OF AGENCY: **Illinois Environmental Protection Agency (IEPA)**

POINT OF CONTACT: **Roger Lauder**

1021 North Grand Avenue
Springfield, Illinois 62706

Phone Number **(217) 785-0830** E-mail Address: **Roger.Lauder@illinois.gov**

AGENCY MISSION/ FUNCTION:
The mission of the Illinois Environmental Protection Agency (IEPA) is to safeguard environmental quality, consistent with the social and economic needs of the State, so as to protect health, welfare, property and the quality of life.

Programs, Plans, Policies, Regulations, Funding or Practices	Effect on Loss Reduction (X) Support	Facilitate	Hinder	Comments
Green Infrastructure for Clean Water Act	X			Public Act 96-26, the Green Infrastructure for Clean Water Act, requires the Illinois EPA to assess and evaluate using green infrastructure to help manage stormwater in Illinois. Illinois EPA is currently working with the University of Illinois – Chicago to undertake research to assess effective best management practices, green infrastructure standards and institutional and policy frameworks to support the development of a Green Infrastructure Plan for Illinois.
Clean Water Act Amendments of 1987	X			The Act established the NPDES storm water program. The act called for implementation in two phases; Phase I addressed the most significant sources of pollution in storm water runoff. Phase II addresses other sources to protect water quality, including modernizing wastewater treatment plants to meet water quality standards, replacing aging water mains and sewers and updating drinking water treatment facilities.

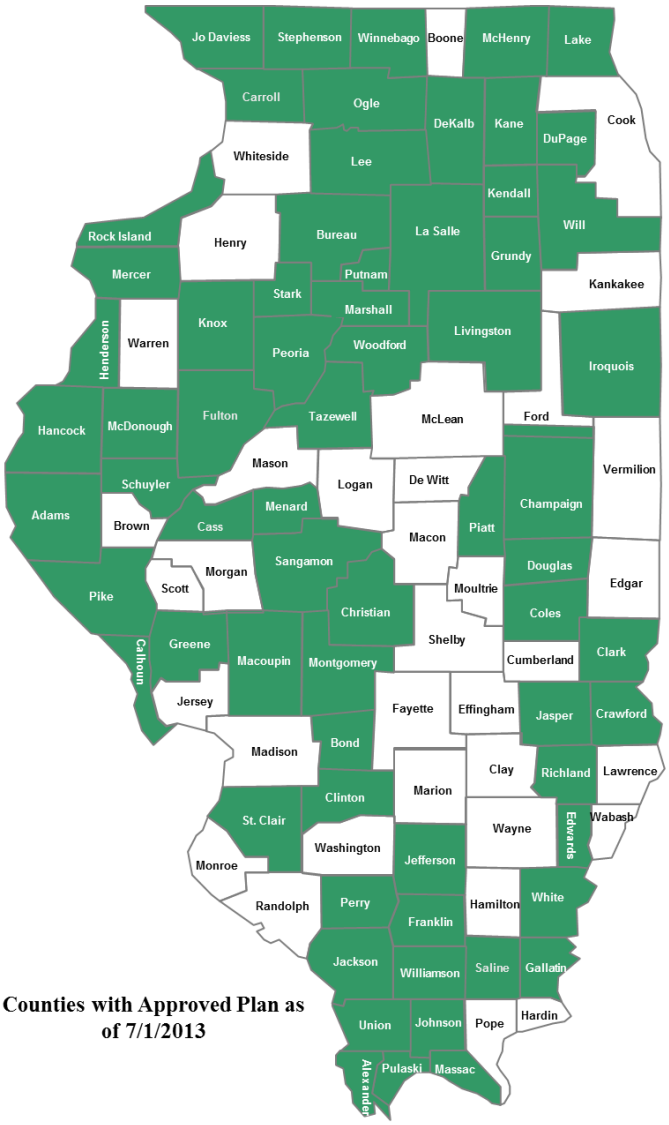
Emergency Operations Unit (EOU)	X			Protect the health and safety of the citizens of Illinois during emergency incidents involving the release of oil, hazardous materials or other contaminants, while stabilizing, minimizing or eliminating the environmental consequences to the land, air or waters of the state.
Hazardous Waste Program Title 35 Ill. Adm. Code, Parts 700-739	X			The intent of the hazardous waste program is to provide a cradle-to-grave management scheme for hazardous wastes to ensure that these wastes are not mismanaged in a manner that will impact human health or the environment. At Illinois EPA, the Bureau of Land Permit Section is responsible for implementing the hazardous waste program.

C. Local Government Mitigation Capability Assessment

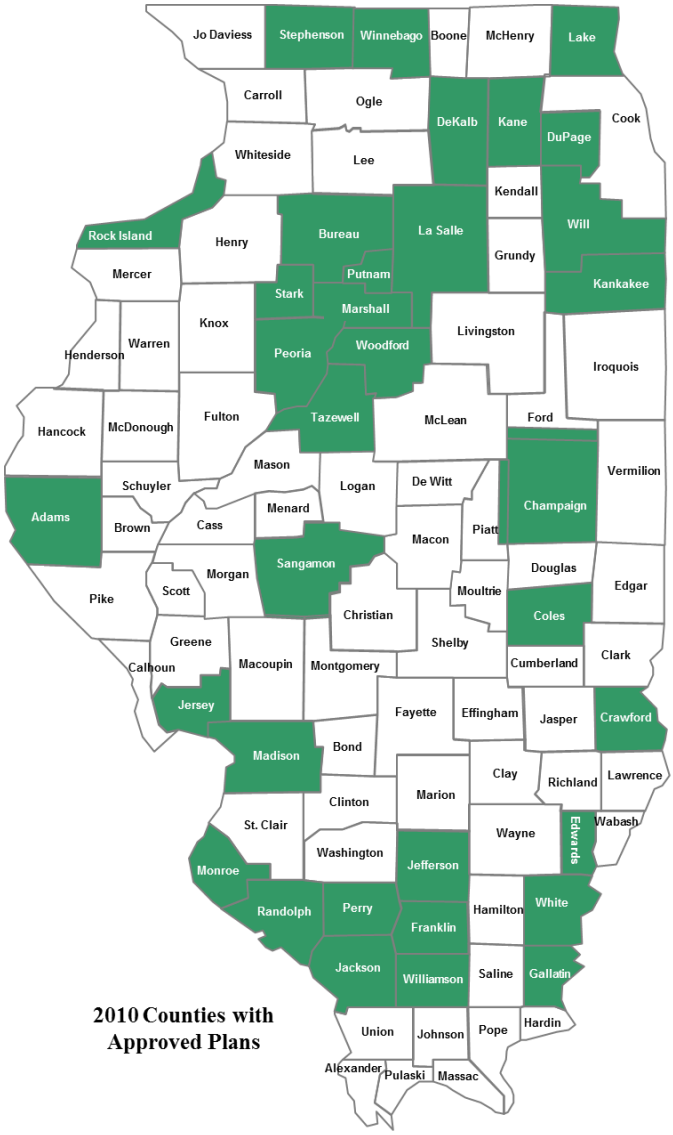
The Illinois Emergency Management Agency (IEMA) and its partner State agencies promote local government mitigation capability by providing technical and educational assistance to identify actions which will be effective for hazard mitigation planning. Existing capability with local units of government varies depending on geographic location, available funding, and the interest of the local government leadership. Local interest in mitigation is usually directly tied to the history of disasters in the jurisdiction; with the jurisdictions most recently impacted having the most interest in mitigation. In general, larger jurisdictions have been more willing and able to build local mitigation capability than their smaller counterparts. Federal laws, such as the Disaster Mitigation Act of 2000 (DMA2K), have specified that in order to receive funds to complete a mitigation project within your jurisdiction, it is necessary for you to have a FEMA/IEMA approved Mitigation Plan. As of July 1st, 2013, 65.7% of the State's counties have an approved mitigation plan. Currently, 17.6% of the counties are writing plans or have a plan submitted for review. The percentage of counties covered by an approved Hazard Mitigation Plan has increased by over 25% over the past 3 years. This increase can be seen as diagramed in the two maps below. It is projected that by the end of 2014 approximately 90% of the State's population will be covered by an approved Hazard Mitigation Plan. The summary of the table and map show us that areas with an approved mitigation plan will become less vulnerable to natural disasters and climate anomalies. In Illinois, the concept of putting together a DMA2K plan is spreading as more jurisdictions wish to complete buyouts, elevations, and other mitigation projects that they are currently unable to do as a result of the Disaster Mitigation Act of 2000. This puts those jurisdictions at a greater risk than those with compliant plans already in place. Although, with the help of FEMA funded disaster planning, more jurisdictions are able to acquire contractors for help in achieving a DMA2K compliant plan for their jurisdiction. This assessment of capability and project tracking is expected to develop into more detail when additional mitigation plans are FEMA approved.

2010-2013 Mitigation Plan Statistics		
Counties Covered by Mitigation Plans	67 Counties	Represents 65.7% of State
Counties with Mitigation Plans in Progress	18 Counties	Represents 17.6% of State
Counties that have not started a Mitigation Plan	6 Counties	Represents .5% of State
Counties that do not participate in the National Flood Insurance Program	13 Counties	Represents 12% of State

Local Hazard Mitigation Plan Status Maps

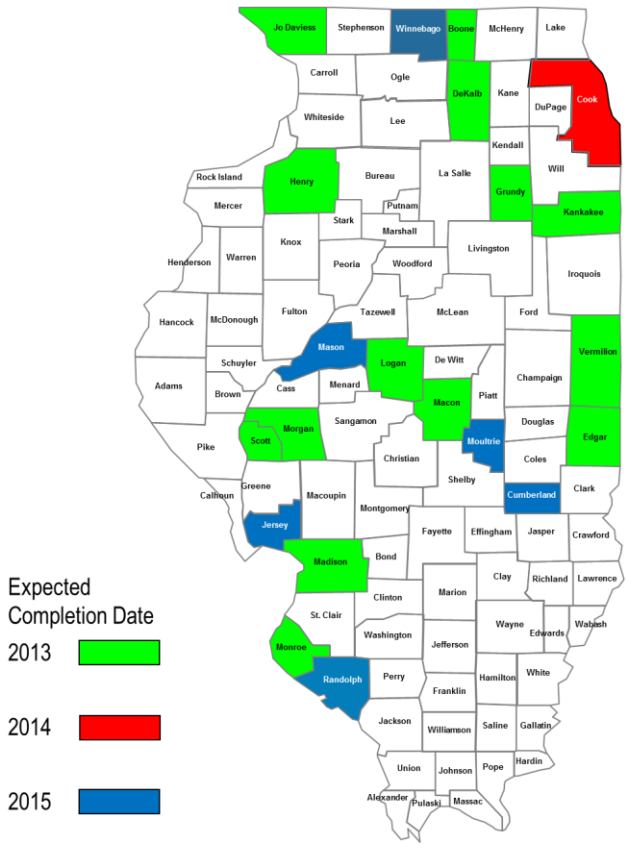


Counties with Approved Plan as of 7/1/2013



2010 Counties with Approved Plans

IEMA



Expected Completion Date

2013

2014

2015

IEMA

Plans that will expire in 2013
- Adams County September 26th, 2013
- Winnebago County July 25th, 2013
- Sangamon County August 28th, 2013
- Will County November 13th, 2013

Plans that will expire in 2014
- Crawford County July 13, 2014
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- Piatt County- February 14th, 2018
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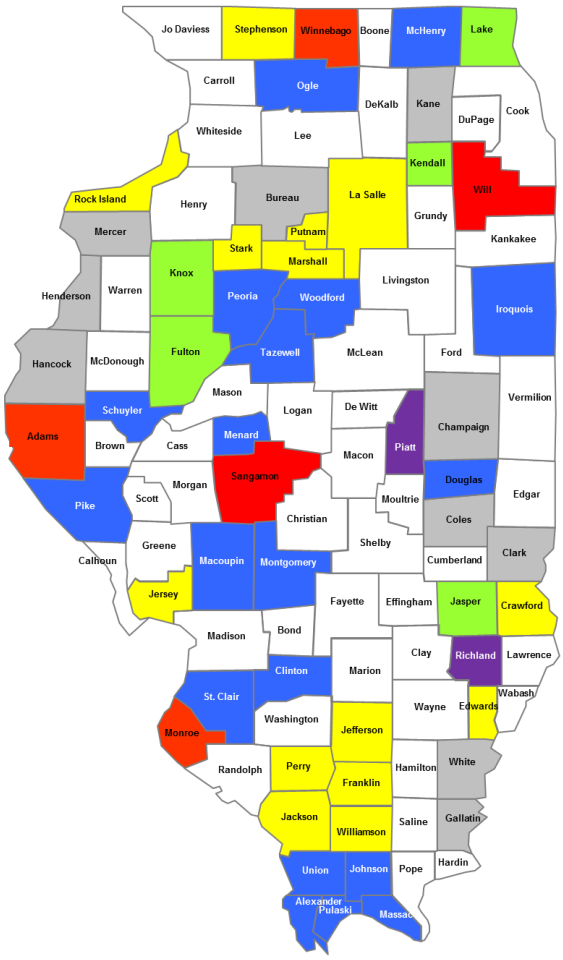
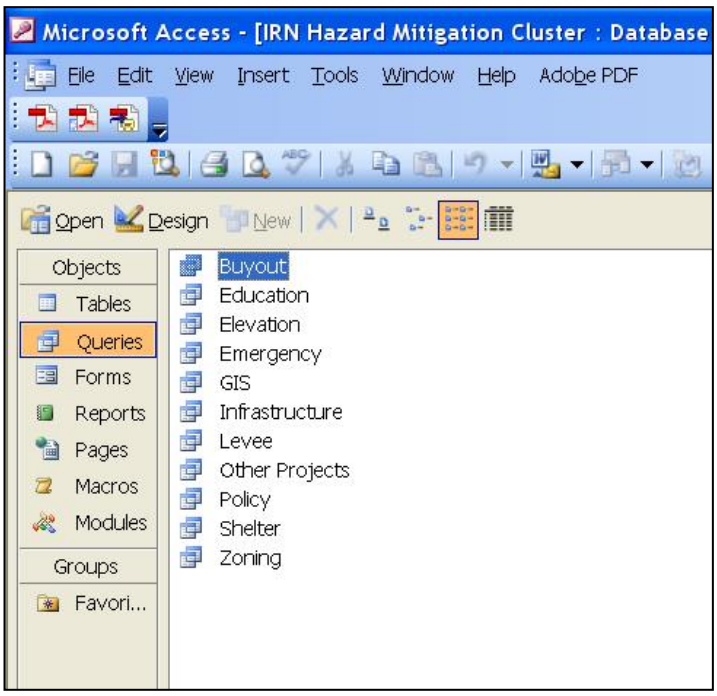
State of Illinois
DMA2K Planning Status
Expirations as of 7-1-2013



Assessing the policies, programs, and capabilities of each local unit of government is a robust task considering the 6,900 local units of government which exist in the State. It must also be noted that the local government leadership changes on a 2- 4 year election cycle, which often changes the mitigation policy, program, and capability within many of the jurisdictions. Illinois has seen its local mitigation planning capability continue to grow over the last 3 years. The effort was made to try and capture the goals established in each jurisdictions program to better understand their capabilities. With the Creation of the Project Tracking Database, we are now able to sort by type of project, whether it is completed or not, what jurisdiction the project will be in, does that county have an approved mitigation plan, and an estimated benefit cost. With this tool, in the future we will be able to gauge their program development and their capability to implement their mitigation goals. We can look at the Policy based actions, Educational based actions, as well as Zoning changes in the community to further ward off future risks to hazards. We will be able to see which actions are most popular and most cost effective to implement. In each identifiable action inside the database we can see funding sources, who is the lead implementer, and jurisdiction specific information. This database will also be utilized by the State's Mitigation Section, to track approved local mitigation projects funded by Hazard Mitigation Grant Funds. This will assist the State in tracking and document the types of mitigation projects being completed throughout the State. In addition, the Mitigation Section will utilize this database to correlate mitigation actions being submitted when updated plans are received. This approach will provide for a well-rounded examination of mitigation projects being completed within the state and those requiring assistance to complete.



The images below provide screen shots of the database we use to track projects that have been identified in the approved plans.

Microsoft Access - [Buyout : Select Query]

File Edit View Insert Format Records Tools Window Help Adobe PDF

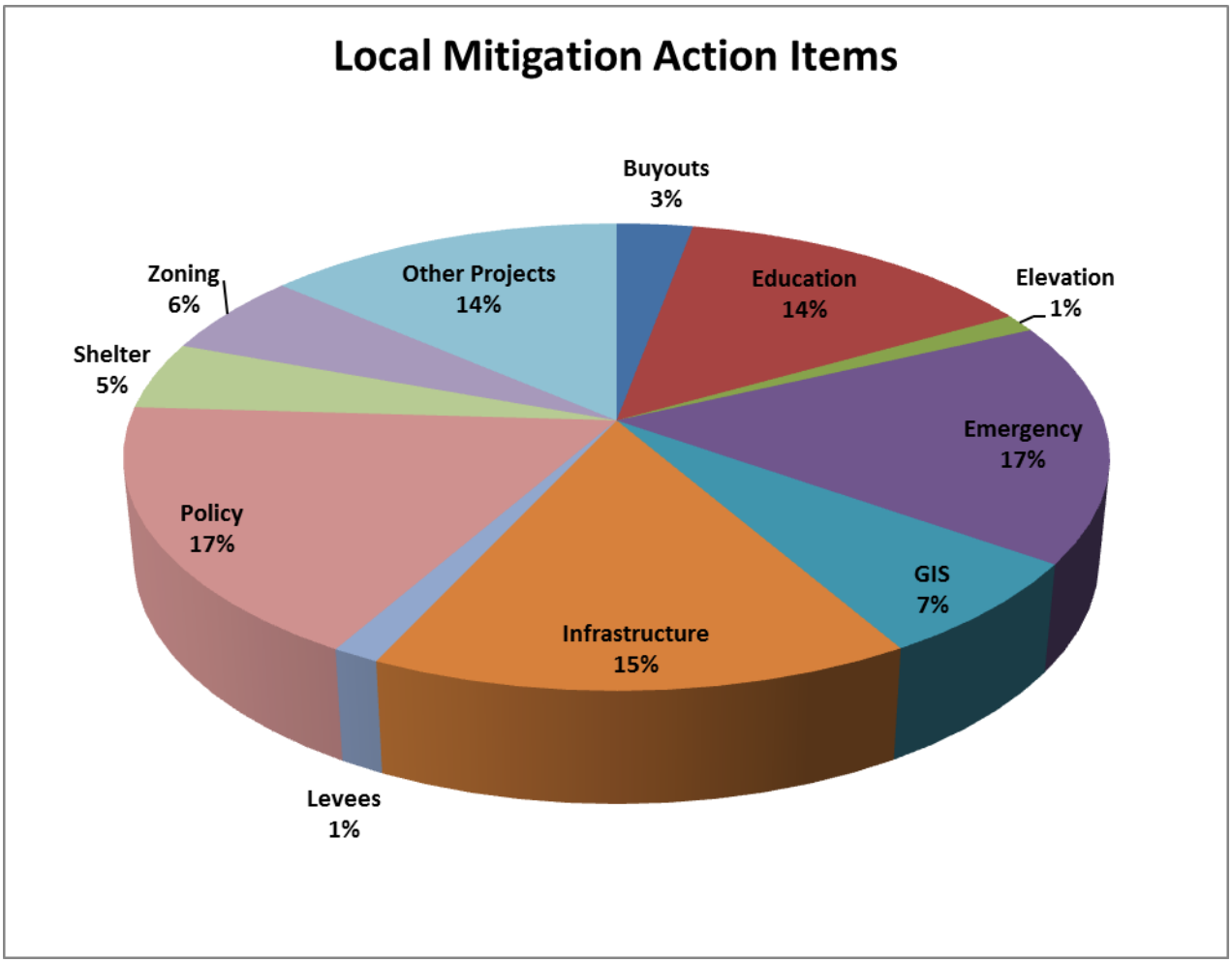
ID	Project Nam	Description	Goal	Jurisdiction	Completion Stat	Buyouts	EstCost	County
450	Flood	Acquire properties located within the Boneyar	2	City of Champa	Not Started	☑		Champaign
449	Flood	Continue to implement plans for the East Univ	1	City of Champa	Not Started	☑		Champaign
562	Flood	When appropriate, acquire flood-prone prope	19	City of Urbana	Not Started	☑		Champaign
448	Flood	Review hazard mitigation options regarding re	3	Village of Broad	Not Started	☑		Champaign
493	Flood	Acquire flood-prone properties along Sangam	13	Village of Mahor	Not Started	☑		Champaign
357	Flood	As repetitive flood loss areas are identified ar	7	DeKalb Cty	Not Started	☑		DeKalb
318	Flood	Properties exposed to flood damage in DuPag	1, 2 4, 6	DuPage County	Not Started	☑		DuPage
376	Flood	Coordinate relocation/acquisition programs w	6	Lake Cty	Not Started	☑		Lake
375	Flood	Inventory and prioritize buildings located in flo	5	Lake Cty	Not Started	☑		Lake
595	Flood	Identify and assess repetitive loss areas in yo	2	City of LaSalle	Not Started	☑	1000	LaSalle
609	Flood	Create open space in the floodplains to reduc	19	City of LaSalle	Not Started	☑	500000	LaSalle
631	Flood	Identify and assess repetitive loss areas in yo	2	City of Ottawa	Not Started	☑		LaSalle
651	Flood	Identify and assess repetitive loss areas in yo	2	Village of Henne	Not Started	☑		Putnam
73	Flood/Prope	Consider voluntary flood acquisition programs			Not Started	☑		Rock Island
74	Flood/Prope	Pursue voluntary acquisition program for Bar		RI County	Not Started	☑		Rock Island
245	Flood	Acquire repetitively damaged flood prone pro		Sangamon Cty	Not Started	☑		Sangamon
278	Flood	Acquire repetitively flood-damaged properties		Springfield	Not Started	☑		Sangamon
115	Flooding	Acquire property located within the NFIP desi	1, 2	Machesney PK	Not Started	☑		Winnebago
139	Flooding	Floodproof, Relocate, Elevate and Demolish a	1, 2	Rockford	Not Started	☑		Winnebago
202	Flooding	Floodproof homes in the floodplains.	1, 2, 3	Winnebago Cty	Not Started	☑		Winnebago

ID 357
Jurisdiction DeKalb Cty **County** DeKalb
First Name Dennis **Last Name** Miller
Description As repetitive flood loss areas are identified and investigated, and as cost-effective mitigation alternatives are developed (acquisition, elevation or floodproofing), funding assistance from FEMA or IEMA should be pursued.

ID 318
Jurisdiction DuPage County **County** DuPage
First Name Norm **Last Name** Sturm
Description Properties exposed to flood damage in DuPage Co. should be protected through property protection measures where regional structural projects are not feasible. Property protection measure should include elevation or floodproofing.

ID 376
Jurisdiction Lake Cty **County** Lake
First Name Kent **Last Name** McKenzie
Description Coordinate relocation/acquisition programs with other local and county-wide land acquisition programs including FPD, CDBG program, park districts and public works.

This database is broken down into 11 broad based mitigation action items categories including: Buyout, Education, Elevation, Emergency, GIS, Infrastructure, Levee, Policy, Shelter, Zoning and Other Projects. As the number of approved local hazard mitigation plan increase so do the capabilities of these jurisdictions. Planning is imperative to properly identify and analyze the specific risks that impact a jurisdiction. This in-depth assessment makes a clear connection between the jurisdiction's vulnerability and the hazard mitigation actions. These local hazard mitigation plans provide the avenue to describe specific hazard mitigation actions and establish a strategy to implement those actions including prioritization, responsible agencies and possible funding avenues. This breakdown also allows the State to identify and maintain consistency regarding the prioritization of mitigation projects approved for funding within the State. The following graph depicts a breakdown in percentage of the mitigation priorities of actions items indicated in approved local hazard mitigation plans.



Local hazard mitigation policies, programs, and capabilities are reviewed with the submission of each local hazard mitigation plan. Policies, programs and capabilities such as building codes, zoning regulations, stormwater management programs, comprehensive plans, and land use polices were evaluated to determine effectiveness. With the number of State agencies represented on the INHMPC, the committee has the resources to provide guidance to local jurisdictions for model ordinances and examples of plans. In addition that State has a variety of possible funding avenues available to local jurisdictions interested in adopting hazard mitigation actions. The State attempts to maximize participation by local governments in FEMA's grant programs such as: PDM, HMGP and FMA. The State supplements these sources with funding from: General Revenue Funds, Flood Hazard Mitigation Program and CDBG Disaster Recovery Program.

The State has been actively working with the local jurisdictions to identify those actions most effective for hazard mitigation planning. In recent years, local governments have adopted and demonstrated capabilities to administer flood planning regulations, and even more have tried to participate in hazard mitigation grant programs. Support is continuing to grow for policies that will help with hazard mitigation. Funding has become increasingly restricted at all levels of government, making implementation of cost effective projects and mitigation friendly policies/regulation essential. The costs of implementing the following measures are relatively low, compared to mitigating future hazards. Many jurisdictions within the State have adopted or incorporate an element of the following items into mitigation efforts. A list of mitigation success stories can be found in Section I of the INHMP, highlighting these efforts. An increase in coordination between counties and local jurisdictions regarding mitigation priorities and planning efforts could also provide an outlet regarding financial burdens. Just as identified with the State capabilities, these policies, regulations and programs should be continually reviewed to determine their effectiveness and subsequently updated to continue to provide the most effective capabilities available. The following is a list of existing and planned policies, programs and capabilities that are expected to improve the effectiveness of local mitigation.

Building Codes

Building codes protect provide the ability to regulate and enforce the design and construction of structures to an established set of standards. Building codes protect new structures from damage by tornados, high winds, snow storms, and earthquakes. Building codes can be implemented in relation to improvements or repairs to ensure mitigation actions are being transposed to mitigate hazard impacts of current structures. Jurisdictions may adopt codes if approved by the State as providing "adequate minimum standards." Local regulations cannot be less restrictive than the State code. The majority of county jurisdictions utilize the Illinois State Building Code **(815 ILCS 670/) Illinois Residential Building Code Act** as their guide for local building standards. The purpose of this Act is to provide minimum requirements for safety and to safeguard property and the public welfare by regulating and controlling the design, construction, installation, and quality of materials of new residential construction as regulated by this Act.

Zoning Ordinances

Zoning ordinances and laws regulate development by dividing the community into zones and by setting development criteria for each zone. Zoning can keep inappropriate development out of hazard-prone areas, such as identified floodplain and can designate certain areas for such thing as conservation, public use, or agriculture. When utilized in conjunction with land use planning, zoning ordinances and laws can effectively mitigate future construction in known hazard-prove locations. Local zoning ordinances can work in conjunction with State statutes that provide the authority for such actions.

Land Use Planning

All local hazard mitigation plans in Illinois have addressed land use planning. Land use planning allows for local governments to manage current and future development of land within their jurisdiction, while preventing development in hazardous areas or strategically alters the development to minimize damage from hazards. Land use planning is often a portion of a comprehensive planning effort and is a strong tool, when utilized in conjunction with mitigation planning.

Subdivision Regulations

Subdivision regulations govern construction and location criteria regarding layout and infrastructure including roads, sidewalks, utilities, storm sewers and drainage ways. Utilizing subdivision regulations allows jurisdictions to ensure developments of new subdivisions are done in non-flood hazard areas. Many of the local hazard mitigation plans address subdivision regulations as a portion of the counties overall zoning regulations.

Floodplain Management Programs

The NFIP provides many of the regulatory requirements associated with local floodplain management. A Local floodplain management program, provides that avenue to institute, regulate and monitor these regulatory requirements. Local floodplain management programs assist in the control of development in floodplains and the implementation of local regulations to floodplain protection. 100% of all of the counties with approved FEMA hazard mitigation plans, participate in the National Flood Insurance Programs (NFIP). In addition, the local hazard mitigation plans had identified floodplain ordinances that regulate development in the floodplain. The majority require existing buildings impacted by a flood to be re-built in such a way to minimize future damages. Many prohibit the development in the floodplain without a permit from the Zoning or Floodplain Administrator.

Stormwater Management/Watershed Development Regulations

Jurisdiction taking part in Watershed Discovery Projects in association with FEMA's "Risk Map" process, utilized the discovery process to collect and analyze data, involve watershed stakeholders and develop recommendations for future projects based on the analysis of the data. In addition, Watershed Development Regulations have the ability to ensure that new development does not increase existing stormwater issues or create additional problems. Provisions regarding development projects should review and regulate how runoff will effect both development and how excess water should be managed. The regulations establish a minimum standard for stormwater management, including floodplains, detention, soil erosion, sediment control, water quality treatment and wetlands.

Emergency Operations Plan

Emergency Operation Plans are a popular and effective element that have been incorporated and referenced during the mitigation planning process. The EOP is a source for hazard identification and emergency operations procedures. These procedures include lists of roes and responsibilities of persons/departments in charge of dispatching support during a natural hazard. Annexes are used to address specific areas of the plan that are not specific enough for particular hazards and functions. The EOP's are required to address 10 functional annexes and 2 hazard specific annexes including earthquake for identified counties in Illinois administrative rules. Additional suggested hazard specific annexes include: drought, flooding and dam failure, tornadoes and severe weather.

V. COORDINATION OF LOCAL MITIGATION PLANNING

A. Local Funding and Technical Assistance

Planning Grants

The Illinois Emergency Management Agency, Bureau of Disaster Assistance and Preparedness, Hazard Mitigation Staff, provides technical assistance and funding to local jurisdictions that request such assistance for plan development.

Since the original 2004 FEMA approved INHMP plan was developed, it has been a priority of both IEMA and FEMA to ensure that the citizens of Illinois are covered by an approved FEMA Hazard Mitigation Plan. It was determined that the best method to coordinate a planning initiative within the state, was to provide planning workshops and utilized state staff to provide technical assistance to individual jurisdictions to promote plan development. This initiative is being completed utilizing a variety of different methods including:

1. Planning Workshops:

Specialized planning workshops or meetings have been held with jurisdictions following declared disasters in order to provide guidance and promote the need for Local Hazard Mitigation Plans. In addition, these specialized workshops allow specific jurisdictional questions to be addressed regarding mitigation planning and potential projects. IEMA Mitigation staff meets with the Emergency Management Coordinator to discuss the planning process as well as resolve any issues related to funding the plan development. This initiative has been and continues to be an effective approach to promote mitigation efforts. Planning workshops have been completed in the following years or upon request: 2008, 2009, 2010, 2011 and 2012.

2. Conference Presentations:

In addition to specialized planning workshops, IEMA Mitigation staff regularly attends and in many cases, speaks at numerous conferences. Conferences allow for the broad dissemination of information to a wide variety of groups, in an effort to heighten the awareness and interest in mitigation planning and projects. This initiative provides the ability to expose a greater

percentage of individuals to the positive benefits of mitigation. Some of these conferences host over 1,000 registrants, with the majority of attendees having local mitigation responsibilities. Examples of conference regularly attended IEMA mitigation staff are:

- Illinois Associate of State Floodplain Managers (IASFM) Conference
- Illinois Emergency Management Agency Conference

3. Technical Assistance:

The IEMA mitigation staff has responded to the increasingly paperless demand for mitigation material. Since April 2004, the agency website has a mitigation section which provides mitigation information. It was determined that in 2008 this section needs to be completely updated to include the latest planning guides, short notes, maps, IL Hazard Rating Process, Local Risk Assessment, approved local plans, local mitigation projects, and hazard specific data for the county planners to utilize. The educational guides and the approved plan resources that we host on our website, have not only increased the website traffic, but also provide planning groups with all the materials they need to complete a plan.

The State of Illinois has 102 counties. Since 2002, many DMA2K workshops have been offered. Illinois counties have been slow to respond in developing DMA2k mitigation plans. Several large counties initially approached and decided not to pursue a plan at that particular time. The common reasons expressed for the lack of interest were: the focus of resources on terrorism planning; the view that they had participated in enough mitigation projects and that they didn't anticipate participating in any in the near future; or that since they had not received funds in the past they didn't anticipate any in the future. The DMA2k planning initiative has continued, however the emphasis is now being placed on developing multi-jurisdiction plans. Over the past ten years the planning initiative has steadily continued to increase. As noted in the 2007 and 2010 plans both timeframes experienced a 200% coverage increase of jurisdictions having a FEMA approved HMP. The promotion of this planning initiative is evident in areas with a high number of repetitive loss properties, as the State has made it a priority to work with local governments willing to act on the issue of repetitive loss properties. The success of the state's acquisition of flood prone properties has required the development of local plans that support the acquisition of such properties, which is consistent with the State planning strategies.

In 2013, 67 of the 102 counties in Illinois have an approved DMA2k plan. This accounts for 65.7% of the counties in Illinois and over 73.8% of the population. Fifteen counties are currently receiving funds for developing DMA2k plans.

In 2004 when the original FEMA Approved INHMP plan was developed, four counties and 26 jurisdictions within those counties had received FEMA approval for their DMA2k plans. Kane County provided their own funds to supplement FMA funds to develop a plan that was the first in the Nation to qualify under DMA2k, FMA, and CRS. Twenty-four jurisdictions in Kane County participated in the planning process and are covered by the plan. The other three counties, Peoria, Tazewell, and Woodford, developed a plan as part of their Project Impact project. Peoria and Pekin, the two largest cities in these counties, participated in the planning process and are covered by the plan.

In 2010, 38 counties had approved DMA2k plans and forty counties were receiving funds for developing DMA2k plans. This was a 200% increase since the previous update in 2007. This new number represented 39% of our state.

One major initiative was the Southern Illinois PDM Planning Grant that was awarded to 17 counties. 9 of those counties have approved Mitigation plans, with 8 expected to be approved by fall of 2010.

Mitigation planning efforts have continued to be a priority over the last three years 2010-2013; with 36 counties obtaining an approved DMA2K plan and 16 counties receiving funds to develop a plan. In addition, we have seen an influx of single jurisdictions seeking approval for a DMA2K approved plan. Over the past three, years Illinois has had over six single jurisdictions (municipalities) submit multi-hazard mitigation plans for FEMA review. Two of these plans have subsequently been approved, with the others making revisions and are projected to be approved following the requested changes. Over 65% of the State's counties currently have a FEMA approved DMA2K plan. Over 73% of the State's population is covered by a FEMA approved hazard mitigation plan. It is projected within the next 1 ½ an additional 20 counties will have their plans completed and

approved, bringing the total of counties with plans to over 82% and covering approximately 95% of the State's population.

The major challenge that we are currently facing, regarding planning, is that the 5 year expiration of the first wave of local jurisdiction plans in Illinois is occurring. Some of these jurisdictions have successfully updated their plan, with others expressing concern in obtaining continued by-in at the local level. These concerns are emphasized with concerns that many of the risks to the local jurisdictions do not change considerably within a 5 year period. As resources become less available, many jurisdictions have to determine the best use of their funds and employees time. The increasing complexity of the planning regulations has also been expressed as a major concern in the creation and update of local hazard mitigation plans. Local jurisdictions have expressed concern that they lack the manpower and technical expertise regarding the requirements have forced them to have to utilized contractors to complete the planning projects. This in turn has increased the over cost of the plan, resulting in additional fiscal impacts to the already restricted local budgets. However, in spite of these concerns; jurisdictions are encouraged to remain current with their hazard mitigation planning, to lessen the impact of the risks that have been identified in their plans. This proactive approach to mitigation can ultimately lead to lessening pressures and damages following a disaster.

When all of the counties complete the DMA2k planning process that currently is in some stage of plan development, 83 counties will have a DMA2k compliant plan with many additional communities having participated in the process. The following page includes a map illustrating the status of Hazard Mitigation Plans in the State of Illinois.

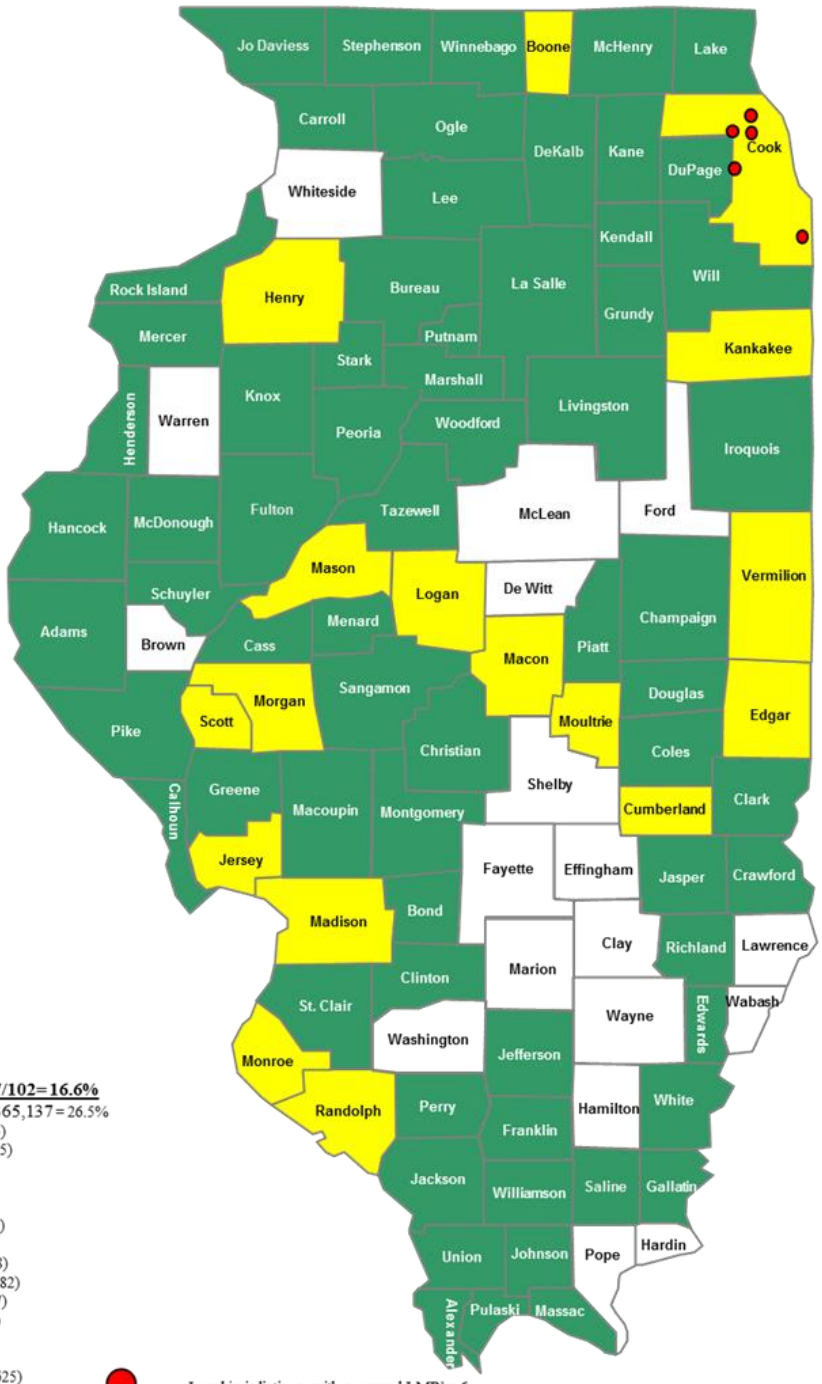
State of Illinois
Local Mitigation Plan (LMP) Status
7/01/13

Counties with an approved/adopted LMP **67/102 = 65.7%**
Population covered by LMP: **9,467,681/12,830,632 = 73.8%**

1. Adams County 11-13-2008 (67,103)
2. Alexander County 4-8-2011 (8,238)
3. Bond County 4-8-2011 (17,768)
4. Bureau County 1-15-2010 (34,978)
5. Calhoun County -10-26-2011 (5,089)
6. Carroll County – Waiting adoption (15,387)
7. Cass County – 4-1-2013(13,642)
8. Champaign County 1-15-2010 (201,081)
9. Christian County –8-30-2011 (34,800)
10. Clark County 11-19-2010 (16,335)
11. Clinton County 4-8-2010 (37,762)
12. Coles County 1-15-2010 (53,873)
13. Crawford County 7-13-2009 (19,817)
14. DeKalb County – Waiting adoption (105,160)
15. Douglas County 3-23-2011 (19,980)
16. DuPage County – 5-24-2013 (916,924)
17. Edwards County 7-13-2009 (6,721)
18. Franklin County 9-25-2009 (39,561)
19. Fulton County – 7-10-2012 (37,069)
20. Gallatin County 1-15-2010 (5,589)
21. Greene County – 10-26-2011 (13,886)
22. Grundy County- Waiting Adoption (50,063)
23. Hancock County 8-31-2010 (19,104)
24. Henderson County 9-28-2010 (7,331)
25. Iroquois County 4-8-2011 (29,718)
26. Jackson County 9-25-2009 (60,218)
27. Jasper County 5-22-2012 (9,698)
28. Jefferson County 9-25-2009 (38,827)
29. Jo Daviess County – Waiting Adoption (22,678)
30. Johnson County 4-8-2011 (12,582)
31. Kane County 2-3-2010 (515,269)
32. Kendall County 5-22-2012 (114,736)
33. Knox County 4-30-2012 (52,919)
34. Lake County – 7-26-2012 (703,462)
35. LaSalle County 4-29-2009 (113,924)
36. Lee County 8-11-2011 (36,031)
37. Livingston County – 10-26-2011 (38,950)
38. Macoupin County 6-30-2011 (47,765)
39. Marshall County 4-29-2009 (12,640)
40. Massac County 4-8-2011 (15,429)
41. Menard County 6-7-2011 (12,705)
42. Mercer County 7-27-2010 (16,434)
43. McDonough County 8-30-2011 (32,612)
44. McHenry County 1-7-2011 (308,760)
45. Montgomery County 12-6-2010 (30,104)
46. Ogle County 6-30-2011 (53,497)
47. Peoria County 2-10-2010 (186,494)
48. Perry County 9-25-2009 (22,350)
49. Piatt County 2-14-2013 (16,729)
50. Pike County 6-30-2011 (16,430)
51. Pulaski County 4-8-2011 (6,161)
52. Putnam County 2-17-2009 (6,006)
53. Richland County – 1-31-2013 (16,233)
54. Rock Island County 4-6-2009 (147,546)
55. Sangamon County 8-28-2008 (197,465)
56. Saline County – 6-11-13 (24,913)
57. Schuyler County 3-23-2011 (7,544)
58. Stark County 4-29-2009 (5,994)
59. Stephenson County 2-17-2009 (47,711)
60. St. Clair County 6-30-2011 (270,056)
61. Tazewell County 2-10-2011 (135,394)
62. Union County 4-8-2011 (17,808)
63. White County 1-15-2010 (14,665)
64. Will County 11-13-2008 (677,560)
65. Williamson County 2-17-2009 (66,357)
66. Winnebago County 7-25-2008 (295,266)
67. Woodford County 1-4-2011 (38,664)

Local jurisdictions that are developing LMPs **17/102=16.6%**
Population covered by LMP in development: 3,365,137 = 26.5%

1. Boone County – planning in progress (54,165)
2. Cook County – planning in progress (5,194,675)
3. Edgar County – planning in progress (18,576)
4. Henry County – planning in progress (50,486)
5. Jersey County- planning in progress (22,985)
6. Kankakee County- planning in progress (113,449)
7. Logan County – planning in progress (30,305)
8. Macon County – planning in progress (110,768)
9. Madison County – planning in progress (269,282)
10. Monroe County – planning in progress (32,957)
11. Morgan County- planning in progress (35,547)
12. Moultrie County- planning in progress (14,846)
13. Scott County – planning in progress (5,355)
14. Vermilion County – planning in progress (81,625)
15. Cumberland County- planning in progress (11,048)
16. Mason County- planning in progress (14,666)
17. Randolph County- planning in progress (33,476)



Local jurisdictions with approved LMP's: **6**

1. City of Chicago- Waiting adoption (2,695,598)
2. Calumet City- Waiting adoption (37,042)
3. Glenview- 8-12-2010 (44,692)
4. Oak Park- Waiting adoption (51,878)
5. Westchester- 6-14-2013 (16,718)

IEMA

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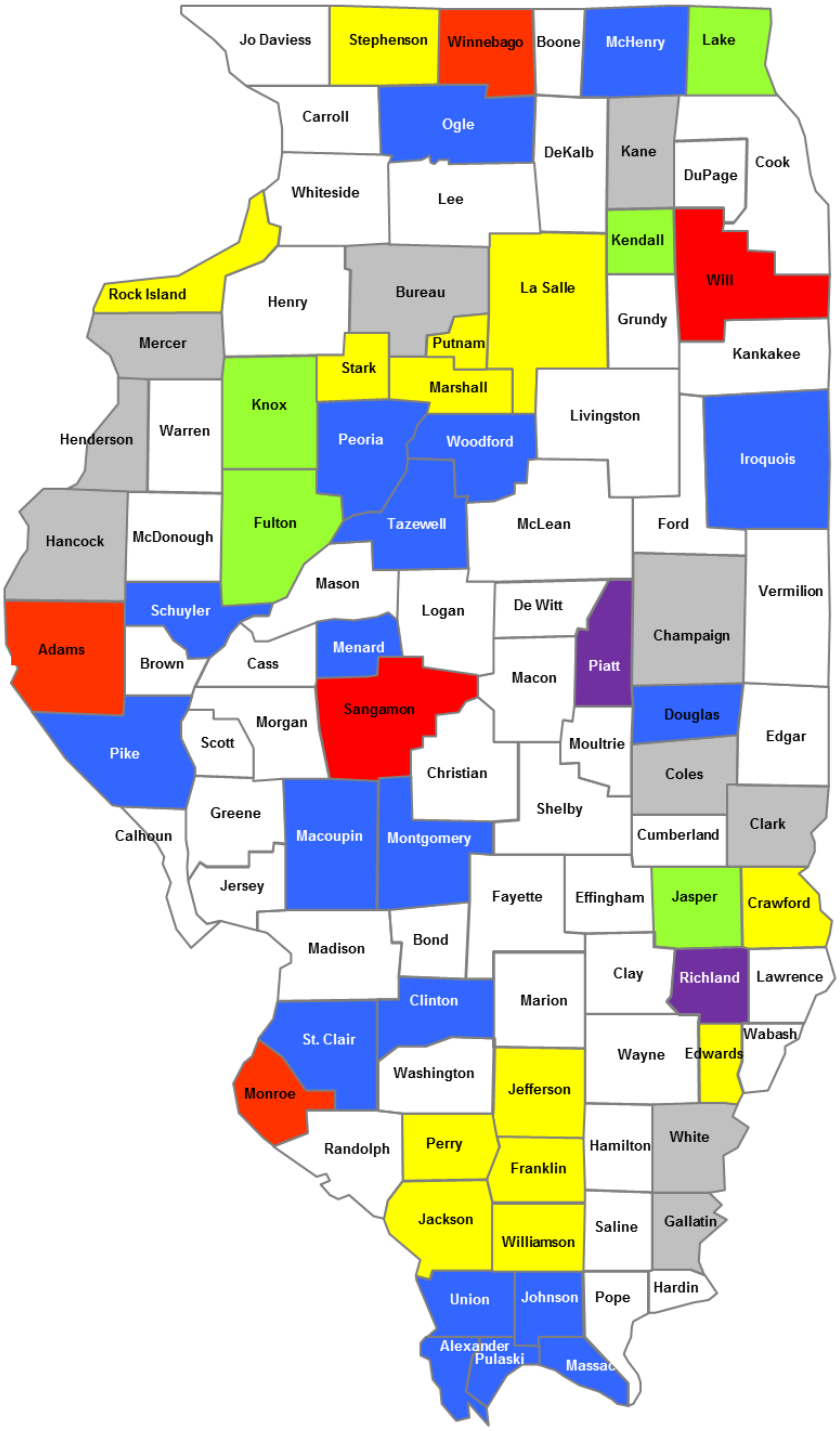
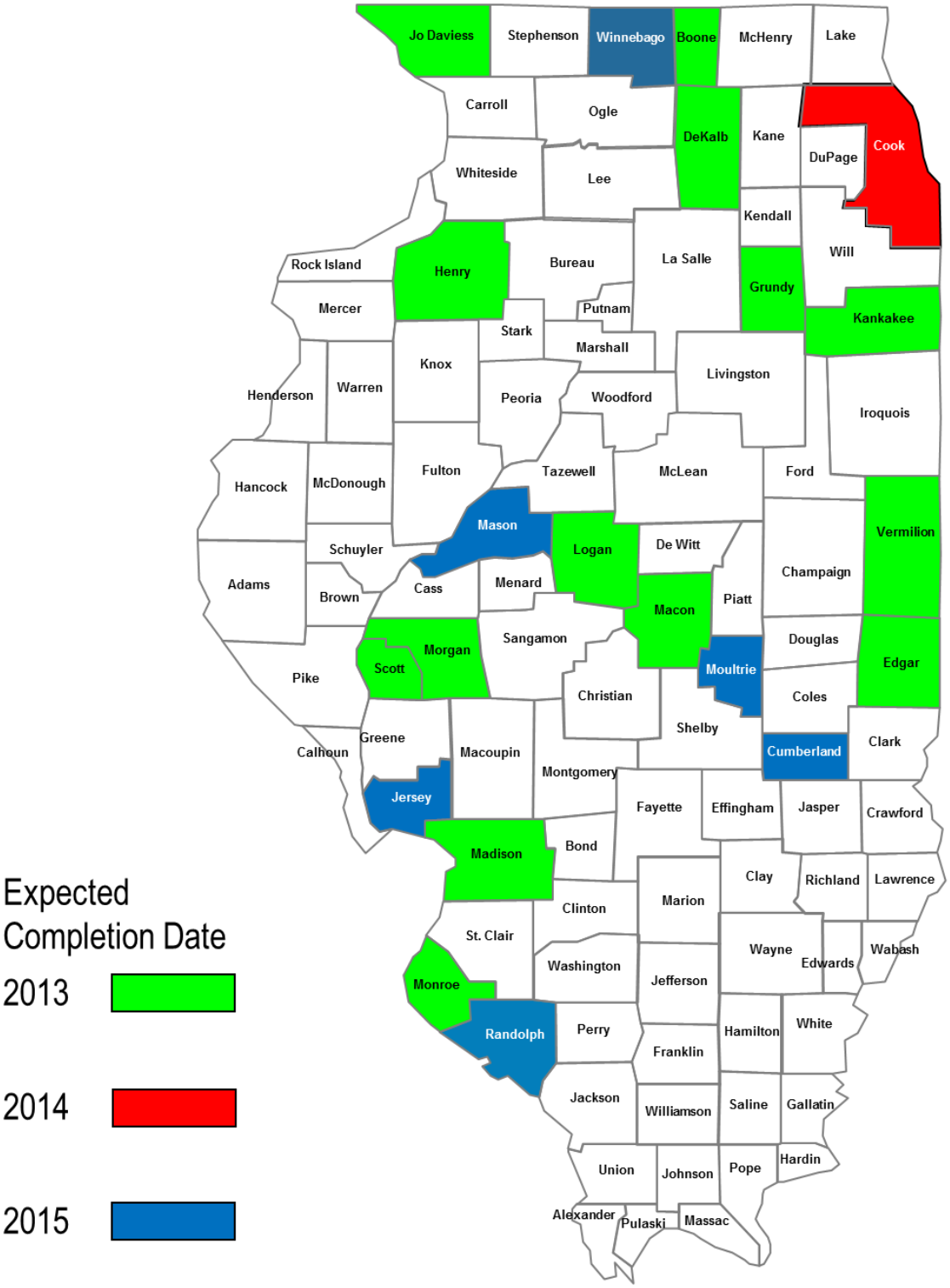


IEMA


Jo Daviess
Stephenson
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Lake
Carroll
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DeKalb
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DuPage
Cook
Whiteside
Lee
Kendall
Will
Rock Island
Henry
Bureau
La Salle
Grundy
Mercer
Putnam
Kankakee
Stark
Marshall
Knox
Livingston
Henderson
Warren
Peoria
Woodford
Iroquois
Hancock
McDonough
Fulton
Tazewell
McLean
Ford
Mason
Vermilion
Schuyler
Logan
De Witt
Adams
Brown
Cass
Menard
Champaign
Macon
Piatt
Morgan
Sangamon
Douglas
Scott
Moultrie
Edgar
Pike
Christian
Coles
Greene
Shelby
Clark
Calhoun
Macoupin
Cumberland
Montgomery
Jersey
Fayette
Effingham
Jasper
Crawford
Madison
Bond
Clay
Richland
Lawrence
Marion
Clinton
St. Clair
Wayne
Edwards
Wabash
Washington
Jefferson
Monroe
Randolph
Perry
Hamilton
White
Franklin
Jackson
Williamson
Saline
Gallatin
Union
Johnson
Pope
Hardin
Alexander
Pulaski
Massac
Expected Completion Date
2013
2014
2015

Funds for planning assistance come from three Federal sources:

(1) Hazard Mitigation Grant Program (HMGP) funds

Up to 7% of HMGP funds can be used for planning assistance.

FEMA-1416: A total of $177,600 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Will County, Randolph County, Coles County, Jersey County and Calumet City.

FEMA-1469: $14,000 was allocated for LaSalle and Putnam counties to develop a hazard mitigation plan. These two counties were significantly impacted by this FEMA disaster. LaSalle County got an additional $21,200 from FMA for the flood portion of the plan. The North Central Illinois Council of Governments is contracted to develop these plans.

FEMA-1513: $15,510 was allocated for Bureau, Marshall and Stark counties. Bureau County got an additional $21,100 from FMA for the flood portion of the plan. The North Central Illinois Council of Governments is also contracted to develop these plans.

FEMA-1633: A total of $46,167 was allocated to Hazard Mitigation Planning for the following jurisdiction:

- Sangamon County

FEMA-1681: A total of $177,600 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Iroquois County, Livingston County, Montgomery County, Tazewell County, Peoria County and Woodford County.
- An additional $3,014,025 was used for acquisitions in Rockford.

FEMA -1722: No funds were allocated for planning projects.
A total of $213,470 was allocated for culvert work in Aurora.

FEMA-1729: A total of $177,600 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Hancock County, Henderson County Mercer County and Pike County
- An additional $3,008,816 was allocated to Machesney Park for acquisitions.

FEMA-1747: A total of $64,326 was allocated to Hazard Mitigation Planning for the following jurisdiction:

- McHenry County
- An additional $758,640 was allocated to Carol Stream for acquisitions.

FEMA-1771: A total of $689,213 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Clark County, Cook County, Douglas County, Fulton County, Menard County and Schuyler County.
- An additional $9,846,470 was also allocated for the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 109 flood prone structures
    - Stream bank stabilization
    - Removal of fill from floodway
    - Educational outreach

FEMA 1800: A total of $667,344.25 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Ogle County, Calhoun County, Christian County, Green County, Jasper County, Kendall County, Knox County, Lee County, Macoupin County, Piatt County, and Richland County.
- An additional $12,672,451.75 was also allocated for the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 258 flood prone structures
    - Code plus construction

FEMA 1826: A total of $107,250 was allocated to Hazard Mitigation Planning for the following jurisdictions:

- Lake County (Plan update) & Saline County

FEMA 1850: A total of $42,189 was allocated to develop a Hazard Mitigation Planning for the following jurisdictions:

- Grundy County
- An additional $2,114,620 was also allocated for the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 5 flood prone structures
    - Construction of detention basins
    - Culvert improvements

FEMA 1935: A total of $642,450.25 was allocated for planning applications in the following counties:

- Boone County, Carroll County, Edgar County, Henry County, Jo Daviess County, Logan County, Macon County, Madison County, Monroe County, Morgan County, Scott County and Vermillion County

- A total of $52,379,973.00 was requested for the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 316 flood prone structures
    - Elevations of flood prone structures
    - Construction of storm water detention ponds and storage basins
    - Food proofing of a variety of structures
    - Stream bank stabilization
    - Roadway elevation to critical facility
    - Water main bypass to ensure sufficient water supply
    - Construction and retro-filling of safe rooms
    - Seismic analysis
    - Educational programs including: websites development and educational displays

FEMA 1960: A total of $301,493 has been requested for planning applications for the following counties:

- Cumberland County, Jersey County, Mason County, Moultrie County and Winnebago County
- A total of $6,711,384 was requested to complete the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 158 flood prone structures and lots

FEMA 1991: $134,396 was awarded to the Illinois Emergency Management Agency for the completion of a level 1.5 HAZUS analysis for flooding, which will analyze the critical/essential facilities within the 100 year floodplain of all 102 counties.

- A total of $4,422,107 was requested to complete the following mitigation projects throughout the State of Illinois as a result of successfully approved local mitigation plans:
    - Acquisition of 30 flood prone structures and lots
    - Construction of storm water detention ponds
    - Development of mitigation educational material, including videos
    - Hardening critical infrastructure

(2) Pre-Disaster Mitigation (PDM) Program funds

Since 2004, PDM planning funds have been awarded on a competitive basis for the State and local communities.

FY2003 PDM Funds: A total of $196,387 was allocated for planning efforts in the following jurisdictions:

- Adams County, Kankakee County, Lake County and the City of Chicago

A total of $2,084,862 was allocated to Kane & Lake Counties for a flood study, property acquisitions and elevations.

FY2004 PDM Funds: No awards were received in 2004

FY2005 PDM Funds: A total of $390,003 was allocated for planning efforts in the following jurisdictions:

- DuPage & Rock Island Counties
- Mid-American Earthquake Center Study

FY2006 PDM Funds: A total of $1,062,000 was allocated for planning efforts in the following jurisdictions:

- SIU/Polis Center Southern Illinois Planning Project: Alexander County, Bond County, Clinton County, Crawford County, Edwards County, Franklin County, Gallatin County, Jackson County, Jefferson County, Johnson County, Massac County, Perry County, Pulaski County, St. Clair County, Union County, White County and Williamson County.
- DeKalb County

FY2007 PDM Funds: A total of $101,165.95 was allocated for planning efforts in the following jurisdictions:

- Winnebago County & Champaign County

FY2008 PDM Funds: No planning funds were allocated in the 2008 PDM funding. A total of $1,577,000 was allocated for property acquisitions in Lake County.

FY2009 PDM Funds: No planning funds were allocated in the 2009 PDM funding. A total of $484,365 was allocated for property acquisitions in Villa Park.

FY2010 PDM Funds: A total of $54,750 was allocated for planning efforts in the following jurisdictions:

- Cass County

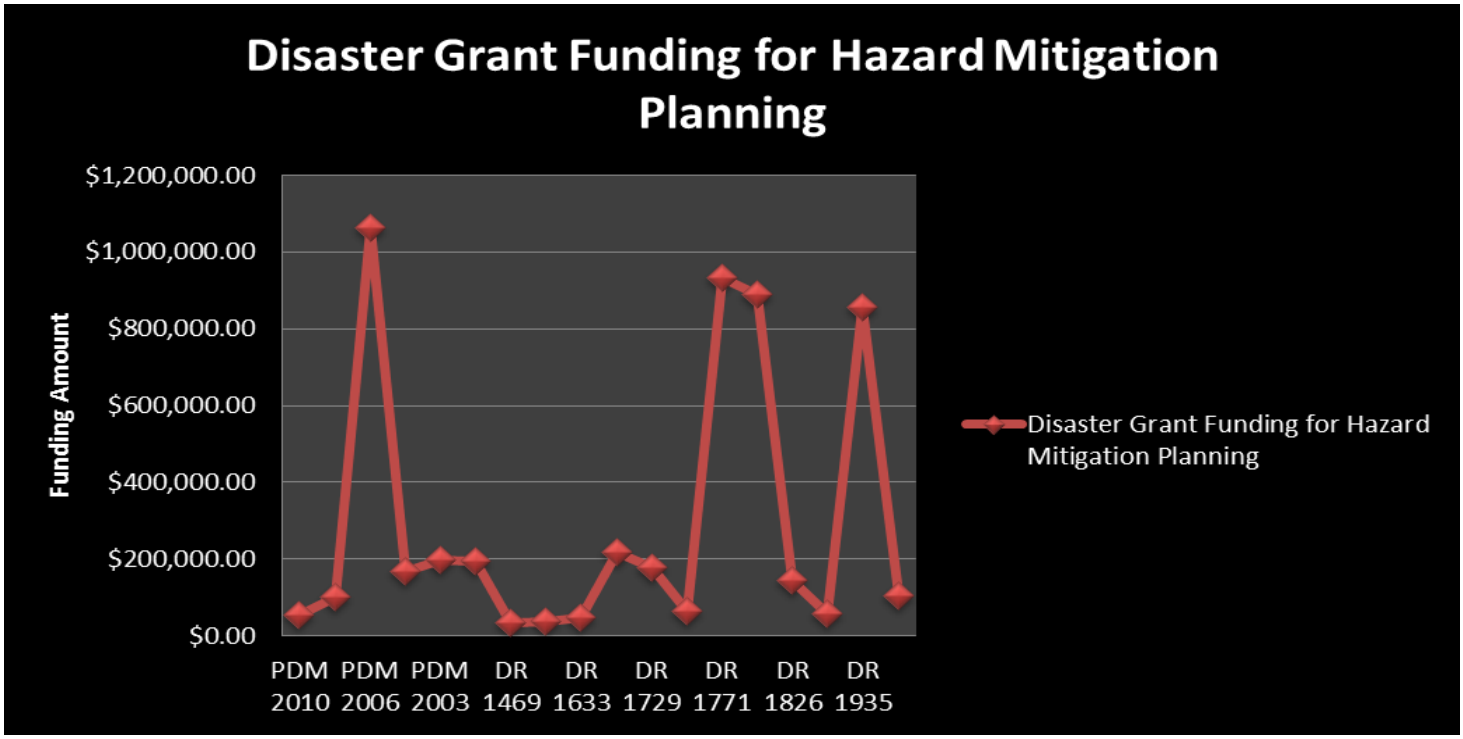
FY2011 PDM Funds: No planning funds were allocated in 2011.
A total of $656,625 was allocated for property acquisition in Addison.

FY2012 PDM Funds: No awards were received in 2012

(3) Flood Mitigation Assistance (FMA) Program funds.

FMA funds can only be used by local communities for the flood portion of the mitigation plan. Adams, Lake, and Kane counties used FMA funds to complete the flood section of their DMA2k plan. In the last three years, three jurisdictions either have used or are using funds to complete their plans LaSalle County (03), Bureau County (04) and City of Des Plaines (05). More specific numbers about FMA projects can be found in Chapter IV of this plan.

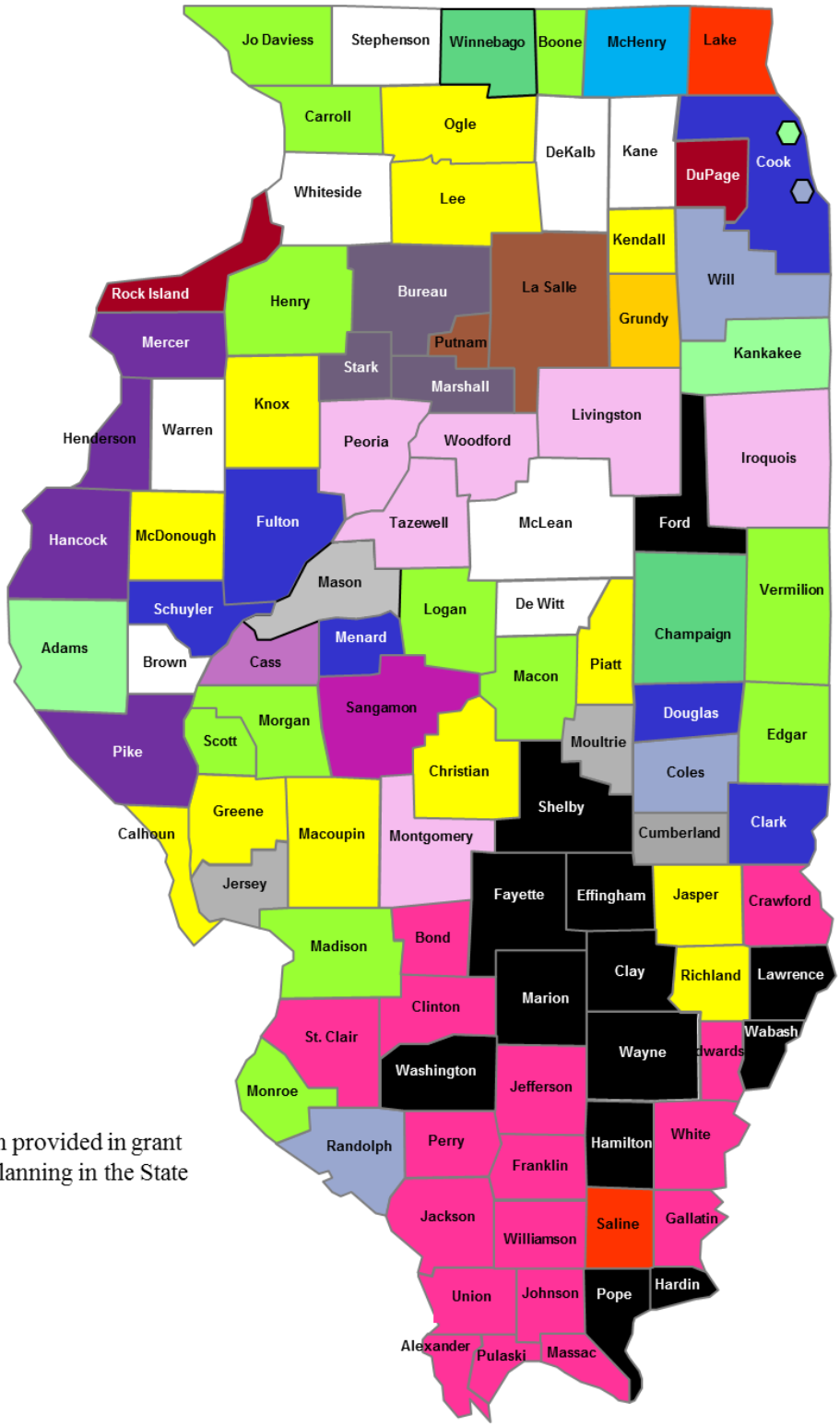
The following graph shows a depiction of federal funding utilized for planning efforts in the State of Illinois. The map following the graph provides a depiction utilizing 18 disasters that produced federal funding opportunities for the development of a DMA2k compliant Hazard Mitigation Plan. As seen these federal grant funds have been provided to or offered to all 102 counties within Illinois.



IEMA

State of Illinois
DMA2K Disaster Grant Funding
Updated: 7/1/2013

- PDM 2010 - $54,750
- PDM 2007 - $101,166
- PDM 2006 - $1,062,000
- PDM 2005 - $168,750
- PDM 2003 - $196,387
- Disaster 1416 - $194,174
- Disaster 1469 - $35,000
- Disaster 1533 - $36,610
- Disaster 1633 - $46,167
- Disaster 1681 - $216,333
- Disaster 1729 - $177,600
- Disaster 1747 - $64,326
- Disaster 1771 - $933,567
- Disaster 1800 - $889,792
- Disaster 1826 - $143,000
- Disaster 1850 - $56,000
- Disaster 1935 - $856,472.
- Disaster 1960 - $103,357
- Not participating in NFIP
- No Funds Requested



• A total of **$5,335,451** has been provided in grant funding for hazard mitigation planning in the State of Illinois since 2002.

FEMA

REGION V

* HMGP Lock-In

ILLINOIS	HMGP		INDIANA	HMGP		MICHIGAN	HMGP		MINNESOTA	HMGP		OHIO	HMGP		WISCONSIN	HMGP
819	$0		869	$384,615		1028 - Volkmer, PA & MT	$686,746		824	$320,484		831 - IA only			874	$350,366
860 - PA only			885	$554,390		1128	$2,668,751		929 - PA & MT only	$725,943		870	$663,441		877 - IA only	
871	$424,143		891	$250,833		1181	$5,192,887		946	$0		951	$373,789		912	$54,342
878	$63,245		899 - PA & MT only	$1,583,836		1226 - PA & MT only	$3,653,569		993 - Volkmer	$12,804,763		1065 - Volkmer	$721,500		959	$19,434
941	$311,708		953	$216,396		1237 - PA & MT only	$949,106		1064 - PA & MT only	$768,959		1097	$1,721,655		963	$188,187
997 - Volkmer	$33,859,205		962 - PA & MT only	$161,915		1346 - NEMIS, IA & MT or	$33,020,508		1078 - PA & MT only	$559,718		1122 - PA & MT only	$1,137,951		964	$195,537
1025	$2,607,000		1002 - Volkmer, IA & MT	$469,952		1413 - PA & MT only	$756,962		1116 - PA & MT only	$1,204,423		1164	$9,821,524		994 - Volkmer	$10,503,365
1053	$3,690,441		1109 - PA only			1527 - 7.5%, IA & MT only	$3,125,321		1151 - PA & MT only	$1,870,010		1227	$5,866,126		1131 - PA & MT only	$258,395
1110	$421,005		1125	$937,133		1777 - 15%, PA & MT only	$2,248,593		1158 - PA only			1321 - NEMIS, IA & MT or	$297,310		1180	$4,698,752
1112	$3,542,964		1165	$2,018,361		4121 - PA & MT only		*	1175	$30,063,750		1339 - IA & MT only	$1,132,279		1236 - PA & MT only	$1,471,849
1129	$20,419,462		1217 - PA & MT only	$697,209			$52,302,443		1187	$1,841,385		1343 - IA & MT only	$558,025		1238	$3,337,816
1170	$369,013		1234 - PA & MT only	$743,291					1212	$4,986,531		1390 - PA & MT only	$876,439		1284 - NEMIS, PA & MT o	$609,044
1188 - IA & MT only	$9,444,166		1418 - NEMIS	$861,988					1225 - PA & MT only	$4,018,116		1444 - IA & MT only	$139,068		1332	$3,318,014
1278 - NEMIS	$116,847		1433	$733,140					1283 - NEMIS	$2,857,945		1453 - 7.5%	$2,415,899		1369	$3,292,556
1368	$1,007,808		1476 - 7.5%	$1,493,752					1288 - PA & MT only	$1,422,187		1478 - IA & MT only	$145,762		1429 - PA & MT only	$496,952
1416	$2,797,158		1487 - IA & MT only	$711,325					1333	$4,784,611		1484	$6,016,488		1432	$817,188
1469 - 7.5%, IA & MT only	$202,306		1520	$743,549					1370	$5,625,419		1507	$875,265		1526 - 7.5%	$1,362,737
1513	$229,725		1542 - PA & MT only	$209,109					1419	$5,859,732		1519 - IA & MT only	$2,305,560		1719 - 20%	$4,164,059
1633	$912,416		1573	$2,476,257					1569 - 7.5%	$607,510		1556	$3,948,349		1768 - 20%	$23,156,913
1681 - 15%, PA & MT only	$3,280,745		1612	$312,215					1622 - PA & MT only	$624,188		1580	$7,534,746		1933 - 20%	$16,003,899
1722 - IA & MT only	$273,823		1662 - 15%, IA & MT only	$1,911,972					1648 - PA & MT only	$514,228		1651 - 20%, IA & MT only	$1,798,019		1944 - 20% - PA & MT on	$793,713
1729	$3,186,416		1732 - IA & MT only	$863,944					1717 - 15%	$10,186,020		1656 - 20%	$3,411,736		1966 - 20% - PA & MT on	$1,627,060
1747 - IA & MT only	$918,936		1740	$1,899,055					1772 - PA & MT only	$938,765		1720 - 20%	$6,630,799		4076 - 20% - PA & MT on	$1,578,803 #
1771	$10,929,736		1766	$25,531,906					1830	$6,204,157		1805 - 15%	$6,507,249			$78,298,981
1800	$13,339,796		1795	$8,697,584					1900 - PA & MT only	$1,915,501		4002 - PA & MT only	$5,046,137			
1826	$1,762,084		1828	$1,676,481					1921 - PA & MT only	$4,229,616		4077 - 20% - PA & MT on	$3,336,803 #			
1850 - PA & MT only	$2,354,500		1832 - IA & MT only	$467,384					1941 - PA & MT only	$4,222,540		4098 - 20% - PA & MT on	$3,179,168 *			
1935	$53,010,484		1997 - PA & MT only	$2,212,313					1982 - PA & MT only	$3,104,513			$76,461,087			
1960 - PA & MT only	$7,159,924		4058	$1,057,305					1990 - PA & MT only	$1,400,977						
1991	$4,624,853			$59,877,210					4009 - PA & MT only	$2,164,673						
4116	$27,353,185	*							4069 - PA & MT only	$6,676,851 #						
	$208,613,094								4113 - PA & MT only	$2,947,544 *						
										$125,451,059						

30-Day Estimated Amount

6-Month Estimated Amount

NO HMGP

GRAND TOTAL $601,003,874

* 11/23/88 Robert T. Stafford Act authorized the Hazard Mitigation Grant Program (HMGP)

Volkmer Amendment changed HMGP ceiling from 5% to 15% calculation (DR# 993 - 1444)

DMA2K changed HMGP ceiling from 15% to 7.5% calculation (DR# 1445 - 1661)

Post-Katrina Emergency Management Reform Act of 2006 changed HMGP ceiling from 7.5% to 15% calculation

For disasters declared after 11/13/07 - Section 324 100% State Management Cost (SMC) policy established MC as "additional" to HMGP ceiling amount (DR# 1732 - ____)

For disasters declared after 6/1/09 - The Unified HMA Guidance is the policy source document (DR# 1850 - ____)

The National disaster sequence skips from DR-1999 to DR-4000 (as the 2000 series are Fire Suppression Authorizations and the 3000 series are Emergency Declarations)

The 5/1/13 HMGP Ceiling memo rescinded the 6-month "floor" lock-in for disasters where 1-yr Lock-In had not yet been issued (DR# 4069, 4076, 4077, 4098) and instituted a "1-yr only" Lock-In Ceiling for new declarations (DR# 4113 - ____)

When planning funds are available in the future, these funds will be allocated using the criteria listed below:

1) The Illinois Natural Hazards Mitigation Planning Committee has developed the following priorities for planning assistance for local jurisdictions:
   A) the lack of an approved DMA 2K Mitigation Plan.
   B) participation in the NFIP. Priority is given to unsanctioned (not on probation or suspension) jurisdictions, (new in 2013 counties not participating in the NFIP may apply for planning funds, however priority will remain with those participating in the event that multiple counties apply.
   C) vulnerability to hazards based on the Illinois Hazard Rating Process (all points (A, B, C, D, F and G) being equal, the jurisdiction(s) with the highest vulnerability to hazards will receive funding),
   D) multi-jurisdictional planning effort,
   E) previously approved mitigation plan (HMGP, FMA or CRS),
   F) their access to geographic information systems and planning resources,
   G) the capability of the jurisdiction to conduct a planning process, or

2) Should a jurisdiction experience a disaster and not have an approved DMA2k Mitigation Plan, they will automatically move to the top of the priority list providing they participate in the NFIP. This will occur even if the jurisdiction does not receive a Presidential declaration. Jurisdictions receiving Presidential Declarations take priority, but jurisdictions that receive a State Declaration will also move up in the list.

When jurisdictions apply for planning funds to develop a DMA2k Mitigation Plan and a disaster has not occurred in that particular jurisdiction, this is how the criteria will be applied. The Plan Development Assistance Prioritization Matrix below will be used to evaluate which local jurisdiction(s) should receive the available funding:

First column is a list of Illinois counties,

Second column is an overall summary of hazards based on the Illinois Hazard Rating Process (refer to the key for the score to be received in this column),

Third column indicates if it is a multi-jurisdictional plan (15 points),

Fourth column indicates if a previously approved mitigation plan exists (15 points),

Fifth column will be used to indicate if a geographic information system exists (15 points),

Sixth column will be used to indicate if there are planning resources (if a planning team or planning department exists add 15 points),

Seventh column will be used to indicate if local matching funds are available (add 15 points if funds are available), and the

Eighth column will be used to identify their ranking (add the score of the five columns together).

If several jurisdictions have an equal score, apply for a planning grant at the same time and sufficient funds are not available for all of the jurisdictions, then other criteria will be used to allocate the funds. The following criteria will be evaluated by the Mitigation Strategy and Coordination Committee to identify the jurisdiction(s) that should receive the limited available funds:

1) Repetitive loss properties (the community with the most will receive the planning grant),

2) if the above item does not clearly identify who should receive the funding, the second criteria to be considered is most intense development pressures (jurisdiction with the largest projected growth rate as identified by the Department of Commerce and Economic Opportunities) for the next five to ten year period

NOTE: The table has already considered the criteria of highest risk

PLAN DEVELOPMENT ASSISTANCE PRIORITIZATION MATRIX

KEY	Severe=5	High=4	Elevated=3	Guarded=2	LOW=1	
County Name	**Overall Hazard Rating**	**Approval DMA 2000 Plan**	**Access GIS**	**Planning Dept. or Team**	**Local funds available**	**Overall rating**
Adams	**Elevated**					
Alexander	**High**					
Bond	**Elevated**					
Boone	**Elevated**					
Brown	**Elevated**					
Bureau	**Elevated**					
Calhoun	**Elevated**					
Carroll	**Elevated**					
Cass	**Elevated**					
Champaign	**High**					
Christian	**High**					
Clark	**Elevated**					
Clay	**Elevated**					
Clinton	**Elevated**					
Coles	**Elevated**					
Cook	**High**					
Crawford	**Elevated**					
Cumberland	**Elevated**					
DeKalb	**Elevated**					
De Witt	**High**					
Douglas	**High**					
DuPage	**High**					

KEY	Severe=5	High=4	Elevated=3	Guarded=2	LOW=1	
County Name	**Overall Hazard Rating**	**Approval DMA 2000 Plan**	**Access GIS**	**Planning Dept. or Team**	**Local funds available**	**Overall rating**
Edgar	**Elevated**					
Edwards	**Elevated**					
Effingham	**High**					
Fayette	**Elevated**					
Ford	**Elevated**					
Franklin	**High**					
Fulton	**Elevated**					
Gallatin	**Elevated**					
Greene	**Elevated**					
Grundy	**Elevated**					
Hamilton	**Elevated**					
Hancock	**Elevated**					
Hardin	**High**					
Henderson	**Elevated**					
Henry	**Elevated**					
Iroquois	**Elevated**					
Jackson	**High**					
Jasper	**Elevated**					
Jefferson	**Elevated**					
Jersey	**Elevated**					
Jo Daviess	**Elevated**					
Johnson	**High**					
Kane	**Elevated**					
Kankakee	**Elevated**					

KEY	Severe=5	High=4	Elevated=3	Guarded=2	LOW=1	
County Name	**Overall Hazard Rating**	**Approval DMA 2000 Plan**	**Access GIS**	**Planning Dept. or Team**	**Local funds available**	**Overall rating**
Kendall	**Elevated**					
Knox	**Elevated**					
Lake	**High**					
La Salle	**Elevated**					
Lawrence	**Elevated**					
Lee	**Elevated**					
Livingston	**Elevated**					
Logan	**High**					
McDonough	**Elevated**					
McHenry	**Elevated**					
McLean	**High**					
Macon	**High**					
Macoupin	**Elevated**					
Madison	**High**					
Marion	**Elevated**					
Marshall	**Elevated**					
Mason	**Elevated**					
Massac	**High**					
Menard	**Elevated**					
Mercer	**Elevated**					
Monroe	**Elevated**					
Montgomery	**Elevated**					
Morgan	**Elevated**					
Moultrie	**Elevated**					

KEY	Severe=5	High=4	Elevated=3	Guarded=2	LOW=1	
County Name	**Overall Hazard Rating**	**Approval DMA 2000 Plan**	**Access GIS**	**Planning Dept. or Team**	**Local funds available**	**Overall rating**
Ogle	**Elevated**					
Peoria	**Elevated**					
Perry	**Elevated**					
Piatt	**Elevated**					
Pike	**Elevated**					
Pope	**Elevated**					
Pulaski	**High**					
Putnam	**Elevated**					
Randolph	**Elevated**					
Richland	**Elevated**					
Rock Island	**Elevated**					
St. Clair	**High**					
Saline	**Elevated**					
Sangamon	**High**					
Schuyler	**Elevated**					
Scott	**Elevated**					
Shelby	**Elevated**					
Stark	**Elevated**					
Stephenson	**Elevated**					
Tazewell	**Elevated**					
Union	**High**					
Vermilion	**High**					
Wabash	**High**					
Warren	**Elevated**					

KEY	Severe=5	High=4	Elevated=3	Guarded=2	LOW=1	
County Name	**Overall Hazard Rating**	**Approval DMA 2000 Plan**	**Access GIS**	**Planning Dept. or Team**	**Local funds available**	**Overall rating**
Washington	**Elevated**					
Wayne	**Elevated**					
White	**High**					
Whiteside	**Elevated**					
Will	**High**					
Williamson	**High**					
Winnebago	**Elevated**					
Woodford	**Elevated**					

Non-Planning Grants

The INHMPC established the following priorities for project funds:

1. As of November 2004, jurisdictions will be required to either have an approved DMA2k plan or be developing a DMA2k plan,
2. A jurisdiction must be participating in the NFIP, and priority is given to unsanctioned jurisdictions,
3. Structures that are substantially damaged (50% or more of the property value) due to a disaster,
4. Projects that mitigate against the loss of human life will take priority over mitigating property loss,
5. Critical facilities in which a retrofit will substantially reduce the risk,
6. Repetitive loss properties with priority given to the target list,
7. Highest benefit/cost ratio,
8. Acquisitions will receive priority over elevations,
9. minor structural projects that will relieve widespread minor damage (inlet control valves),
10. Project will solve the problem independently or is part of another solution with assurance that the project will be completed,
11. Projects with multiple properties to purchase or retrofit,
12. Jurisdiction contributes funds for the project,
13. Jurisdiction has a history of supporting mitigation principles,
14. The jurisdiction with the highest risk,
15. 7% of HMGP funds will be used for planning purposes when possible,
16. The jurisdiction with intense development pressures,
17. 5% of HMGP funds for educational outreach when possible,
18. STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) review process will be used.

The STAPLEE review process considers the following factors:

STAPLEE

SOCIAL

Community Acceptance .....
Effect on Segment of Population .....

TECHNICAL

Technical Feasibility .....
Long-term Solution .....
Secondary Impacts .....

ADMINISTRATIVE

Staffing .....
Funding Allocated .....
Maintenance/Operations .....

POLITICAL

Political Support .....
Local Champion .....
Public Support .....

LEGAL

State Authority .....
Existing Local Authority .....
Potential Local Challenge .....

ECONOMIC

Benefit of Action .....
Cost of Action .....
Contributes to Economic Goals .....
Outside Funding Required .....

ENVIRONMENTAL

Effect on Land/Water .....
Effect on Endangered Species .....
Effect on HAZMIT/Waste Sites .....
Consistent with Community Environmental Goals .....
Consistent with Federal Laws .....

This chart does not contain all of the information necessary to make funding decisions, but serves to provide a summary of the most important factors in the decision making process. We will make a note whether the Benefit Cost (B/C) is provided by the local jurisdiction (L) or the State (S). A correct Benefit Cost analysis requires some technical skill and experience, and prior to project recommendation the State will either confirm the accuracy of the B/C or re-analyze the B/C.

MITIGATION PROJECTS from LOCAL PLANS

Jurisdiction sorted by County	Hazard	Project Description	Properties Total / in floodplain / Repetitive Loss	Total Cost	Source of Local Match	Environ-mental Impact + or -	Social Impact + or -	B/C ratio Local (L) State (S)	Rank

NOTE TO JURISDICTION

This form should be completed after a complete review of the proposed actions, prioritization and the final ranking has been determined. This chart does not contain all of the information necessary to make funding decisions, but serves to provide a summary of the most important factors in the decision making process. Most of the columns are self-explanatory. Place the mean (total benefits divided by the total costs) B/C into the B/C ratio column. We will note whether the Benefit Cost (B/C) is provided by the local jurisdiction (L) or the State (S). A correct Benefit Cost analysis requires some technical skill and experience, and prior to project recommendation the State will either confirm the accuracy of the B/C or re-analyze the B/C. You should put a plus sign if there is a positive impact and a minus sign if there is a negative impact in the environmental and social impacts columns. If there is a negative impact, it is recommended that you attach a description on why the benefits of the project outweigh the negative impact.

There are not columns to indicate if your jurisdiction is a NFIP participating jurisdiction or if the plan has FEMA approval as these are prerequisites for project approval.

LOCAL MITIGATION PROJECTS

_____COUNTY

Jurisdiction	Hazard	Lead Implementer/Contact	Project Description	Properties Total / in floodplain / Repetitive Loss	Total Cost	Source of Local Match	Environ-mental Impact + or -	Social Impact + or -	B/C ratio Local (L) State (S)	Rank

For non-planning grants the IMAG and/or its sub-committees will use benefit cost (B/C) reviews to determine which projects maximize benefits relative to their costs. Since benefit cost analysis requires technical expertise and experience, B/C's submitted by local governments will be confirmed or re-analyzed prior to recommendation. The INHMPC discussed using a point scale to determine project funding. It was determined that a point scale for non-planning projects was not necessary and that the current policy of the MCSC (formerly A&R) committee reviewing and recommending projects has worked without problems or controversies for more than 17 years and should be continued. The MCSC takes into consideration development pressures on the jurisdiction. It is important to note that the IMAG and it's subcommittees are advisory groups. IEMA makes the final decision on all grants they administer.

B. Local Plan Integration

The State of Illinois has the unique opportunity in having a large diversity regarding the development of local hazard mitigation plans (LHMP) and risk assessments. The LHMPs were developed utilizing the resources of a number of independent contractors, planning commissions and in-house local jurisdictional participation by a responsible agency. Due to this diversity, Illinois' LHMPs were created using different planning tools, strategies and perspectives. This has resulted in a number of different approaches to meeting the Local Multi-Hazard Mitigation Planning Guidance Requirements such as: hazard risk assessment, jurisdictional specific mitigation strategies, and public involvement. Whereas the majority of these planning efforts were successful and resulted in a FEMA approved hazard mitigation plan, some plans proved to be a greater resource then others. The following pages provide a review and correlation regarding Illinois' LHMPs.

The Illinois Emergency Management Agency, Bureau of Disaster Assistance and Preparedness, Hazard Mitigation Staff, will be responsible for reviewing, coordinating and linking the local mitigation plans to the State Mitigation Plan. The process laid out here has been questioned by the FEMA Planning Staff as unrealistic for a small Mitigation staff. IEMA agrees that in the past these procedures have not been followed. In June of 2007 a Mitigation Planner was added to the IEMA staff. Since that addition, IEMA is now capable of reviewing local plans in house before the submission to FEMA. Technical assistance is able to be provided to the jurisdictions and the most important part is that local plan integration into the state plan is finally taking place. Since January 1st, 2008, IEMA has increased its local hazard mitigation plan initiative extensively.

The table below represents the success the State of Illinois has had regarding the development of LHMPs:

LHMP Status Comparison – (2008 thru 2013)

January 1st, 2008		
Counties Covered by Mitigation Plans	12 Counties	Represents 11% of State
Counties with Mitigation Plans in Progress	28 Counties	Represents 27% of State
Counties that had not started a Mitigation Plan	43 Counties	Represents 42% of State
Counties that do not participate in the National Flood Insurance Program	17 Counties	Represents 16% of State

January 1st, 2010		
Counties Covered by Mitigation Plans	38 Counties	Represents 37% of State
Counties with Mitigation Plans in Progress	40 Counties	Represents 39% of State
Counties that have not started a Mitigation Plan	18 Counties	Represents 17% of State
Counties that do not participate in the National Flood Insurance Program	13 Counties	Represents 12% of State

July 1st, 2013		
Counties Covered by Mitigation Plans	67 Counties	Represents 66% of State
Counties with Mitigation Plans in Progress	17 Counties	Represents 17% of State
Counties that have not started a Mitigation Plan	19 Counties	Represents 18% of State

I. Local Hazard Mitigation Plan Adoption Status

As of July 1st, 2013, 65.7% of the State's counties have an approved mitigation plan. Currently, 16.7% of the counties are writing plans or have a plan submitted for review. The percentage of counties covered by an approved Hazard Mitigation Plan has increased by over 25% over the past 3 years. Over 73% of the State's population is covered by a FEMA approved LHMP. It is projected that by the end of 2014 approximately 90% of the State's population will be eligible to be covered by an approved Hazard Mitigation Plan. 92% of the LHMPs in Illinois are multi-jurisdictional, with the county being the coordinating entity during the plan development. This approached has allowed Illinois to utilize the Hazard Mitigation Grant Program funds in a fiscally

appropriate manner to more effectively cover the State's population with a LHMP. Illinois has seen an increase in single jurisdiction plan development over the last 6 year, with 6 single jurisdiction plans being developed and or updated. These single jurisdiction plans were focused with in large metropolitan areas, where the county did not have a FEMA approved LHMP.

County	County LHMP	# of Municipalities within the county	# of Municipalities participating in LHMP	# of Municipalities Adopted LHMP	% of participating Municipalities adopted
Adams	Yes	14	1	1	100%
Alexander	Yes	5	5	3	60%
Bond	Yes	10	10	9	90%
Boone	No*	8	0	0	0%
Brown	No	4	0	0	0%
Bureau	Yes	24	9	9	100%
Calhoun	Yes	5	5	0	0%
Carroll	Yes	7	7	7	100%
Cass	Yes	5	5	4	67%
Champaign	Yes	24	24	24	100%
Christian	Yes	15	11	5	45%
Clark	Yes	4	4	4	100%
Clay	No	6	0	0	0%
Clinton	Yes	15	13	13	100%
Coles	Yes	6	4	4	100%
Cook	No	136	6	6	0%
Crawford	Yes	6	5	5	100%
Cumberland	No	6	0	0	0%
DeKalb	No**	14	10	0	0%
De Witt	No	7	0	0	0%
Douglas	Yes	9	7	7	100%
DuPage	Yes	40	31	4	1%
Edgar	No*	8	0	0	0%
Edwards	Yes	5	4	4	100%
Effingham	No	10	0	0	0%
Fayette	No	7	0	0	0%
Ford	No	9	0	0	0%
Franklin	Yes	16	16	12	75%
Fulton	Yes	20	7	0	35%
Gallatin	Yes	7	7	7	100%
Greene	Yes	9	7	1	15%
Grundy	No**	16	10	0	0%
Hamilton	No	5	0	0	0%
Hancock	Yes	15	14	14	100%
Hardin	No	3	0	0	0%
Henderson	Yes	9	8	8	100%

Henry	Yes**	15	13	0	0%
Iroquois	Yes	21	16	5	31%
Jackson	Yes	11	11	11	100%
Jasper	Yes	7	2	0	0%
Jefferson	Yes	10	9	7	78%
Jersey	No	8	0	0	0%
Jo Daviess	Yes**	10	8	0	0%
Johnson	Yes	8	5	3	60%
Kane	Yes	30	26	23	88%
Kankakee	No*	21	0	0	0%
Kendall	Yes	14	7	3	43%
Knox	Yes	15	11	7	64%
Lake	Yes	54	48	48	100%
La Salle	Yes	27	15	1	.06%
Lawrence	No	5	0	0	0%
Lee	Yes	13	7	2	29%
Livingston	Yes	16	14	5	36%
Logan	No*	11	0	0	0%
McDonough	Yes	11	10	9	90%
McHenry	Yes	30	25	18	72%
McLean	No	22	0	0	0%
Macon	No**	12	11	0	0%
Macoupin	Yes	27	7	7	100%
Madison	No*	29	0	0	0%
Marshall	Yes	9	5	5	100%
Mason	No*	9	0	0	0%
Massac	Yes	3	3	3	100%
Menard	Yes	5	5	5	100%
Mercer	Yes	12	11	11	100%
Monroe	No**	6	6	0	0%
Montgomery	Yes	20	7	7	100%
Morgan	No*	10	N/A	0	0%
Moultrie	No*	7	N/A	0	0%
Ogle	Yes	13	10	10	100%
Peoria	Yes	17	3	2	67%
Perry	Yes	6	6	5	83%
Piatt	Yes	9	8	0	0%
Pike	Yes	18	18	8	44%
Pope	No	2	0	0	0%
Pulaski	Yes	7	7	7	100%
Putnam	Yes	6	3	3	100%
Randolph	No*	14	N/A	0	0%
Richland	Yes	5	5	5	100%
Rock Island	Yes	15	15	15	100%
St. Clair	Yes	32	24	23	96%

Saline	Yes	7	7	5	71%
Sangamon	Yes	27	18	18	100%
Schuyler	Yes	4	4	4	100%
Scott	No*	7	N/A	0	0%
Shelby	No	12	0	0	0%
Stark	Yes	4	4	4	100%
Stephenson	Yes	11	5	5	100%
Tazwell	Yes	18	3	2	67%
Union	Yes	6	5	5	100%
Vermilion	No*	21	N/A	0	0%
Wabash	No	4	0	0	0%
Warren	No	6	0	0	0%
Washington	No	14	0	0	0%
Wayne	No	10	0	0	0%
White	Yes	11	10	10	100%
Whiteside	No	11	0	0	0%
Will	Yes	38	26	8	31%
Williamson	Yes	17	16	15	94%
Winnebago	Yes	11	11	11	100%
Woodford	Yes	17	1	1	100%
Totals:		**1429**	**721**	**497**	**69%**

(Municipalities: Cities, Villages, Towns) U.S. Census Bureau. 2010 Census – CDPs not included

*Indicates counties currently developing LHMP.

**Indicates counties which have received a "Approvable Pending Adoption" from FEMA

Although 67 counties and 5 communities currently have approved LHMPs, a large number of jurisdictions within these areas are still ineligible to received HMGP funding due to the lack of a formal adoption of the LHMP. Only 69% of all of the participating jurisdictions have formally adopted the LHMP making them eligible for HMGP project funding. It should be a goal of all local jurisdictional planning efforts to ensure that all participating jurisdictions adopted the LHMP. Additionally, only 50% of the State's municipalities participated in the planning process regarding the development of a LHMP. Efforts should be made to increase the participation levels in future development and updating of all LHMPs.

II. Hazard Analysis and Risk Assessment

Hazard Analysis

When the initial planning process began the Illinois Hazard Rating Process that is described on the following pages of this plan were provided to the local jurisdiction. They can also be obtained on the IEMA website. This tool is necessary in developing the hazard analysis section for the jurisdiction. When local jurisdiction plans are received this information will be required. When local plans receive FEMA approval this information will be incorporated into the Hazard Analysis and Risk Assessment section of the State Mitigation Plan. If the local assessment does not match the State's risk assessment, the State mitigation staff will analyze the data and determine what should be entered into the State Plan. In most cases the County uses a format similar to the States to analyze and assess risk. In the case that they do not, the data gathered by the county for each hazard is used by the State planner to fit into the risk assessment model the State uses as described on Chapter III, page 8. Utilizing a consistent ranking method, allows for a more accurate correlation between the local hazard mitigation plans and the INHMP. It is the State's objective that local jurisdictions use the risk assessment worksheets that follow on page V-51 thru V-53, in an effort to identify potential losses and identify vulnerabilities to critical facilities. In most cases, we find that the localized data is better and we can gain a more accurate picture of the risk. By doing this, the State uses a uniform model for each county in Illinois.

Risk Assessment

In order for the local jurisdictions to identify inventory assets and to make loss projections, they need to refer to the "State and Local Mitigation Planning how-to guide" (FEMA-386-2, August, 2001) for instructions and forms (Worksheet #3a, Worksheet #3b and Worksheet #4) pages V-51 thru V-53 of the INHMP. This planning guide may be obtained from the IEMA Mitigation website or the SHMO. Every jurisdiction is encouraged to complete Worksheet #3a, make an extra copy to provide when submitting the plan for approval. In addition to Worksheet #3a, if the hazards exist for any floods and/or earthquakes with an elevated, high or severe rating, then the form for Potential Structure Losses for Floods and/or the Potential Structure Losses for Earthquakes shall be completed. The coordination between the INHMP and local HMP is vital. The INHMP is reliant on the detailed information found in local HMP's and worksheets submitted. Due to this reliance,

the State places priority on providing a variety of tools, data and resources to assist local jurisdictions with the development of their hazard mitigation plans. In 2013 a statewide HAZUS-MH analysis was completed for flooding. The analysis resulted in a flood assessment report for each of the 102 counties. In addition, the State has compiled and compressed the storm loss data from the National Climate Data Center utilized in the State Risk Assessment. Each of these specific planning tools is available to each jurisdiction to provide consistency during the planning phase and can be directly incorporated into their risk assessments. The majority of these tools are located on the Illinois Emergency Management website or by contacting the State Mitigation Planner.

Highlighted on the next page are the Illinois counties that have submitted a DMA2K plan. Some have used the States Hazard Rating methodology where as others have used their own method. These systems have been evaluated and translated into the State Hazard Rating System for comparison. This correlation was completed in an effort to improve the level of detail and comprehensiveness of statewide risk assessments and coordination of State hazard mitigation goals and objects with local goals and objectives. The following chart is utilized as a checks and balance to ensure the State plan more effectively reflects the analysis of the local hazard mitigation plans. The first column for each county is the State evaluation and the second white column is from the county plan. The correlations of the two hazard ratings were utilized to determine the final State Hazard ranking for each county. During the correlation process, if it was determined that there was a discrepancy of greater than one rating level between the State and Local plan, the overall State Hazard Rating was adjusted accordingly to more accurately reflect the hazard for the county. For example, the State ranked Tornado as elevated for Coles County, whereas the Coles County Hazard Mitigation Plan ranked Tornado as Severe. This correlation proved to be greater than one rating. In order to effectively integrate the two plans ratings, the State Hazard Rating regarding tornados for Coles County was adjusted to a ranking of High. All State Hazard Rating adjustments are italicized in red text, to highlight the discrepancy greater than one rating level.

KEY	LOW= 0-12
Guarded= 13-24	Elevated= 25-36
High= 37-48	Severe=49-60

N/R=Not Referenced

Illinois Hazard Rating By County for those Jurisdictions with Approved DMA2K Plans based off of the Illinois Hazard Rating Process In Chapter III

Updated 7/1/2013

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	County	State	County	State	County	State	County	State	County	State	County
Adams	67,103	High	High	High	Elevated	High	High	Guarded	Elevated	High	Elevated	Guarded	Guarded	Elevated	Elevated
Alexander	8,238	Severe	Severe	High	Severe	High	High	High	N/R	Guarded	N/R	Severe	High	Elevated	High
Bond	17,768	High	High	Elevated	Guarded	High	Severe	Guarded	N/R	High	N/R	Elevated	High	High	Severe
Boone	54,165	High		Elevated		High		Guarded		Elevated		Guarded		Elevated	
Brown	6,937	High		Guarded		High		Guarded		High		Guarded		Elevated	
Bureau	34,978	Severe	Severe	Elevated	Guarded	High	High	*High*	*Guarded*	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Calhoun	5,089	High	High	Elevated	Elevated	High	High	Guarded	Guarded	High	High	Elevated	Guarded	Guarded	Guarded
Carroll	15,387	Severe	Severe	Elevated	High	High	High	High	Elevated	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Cass	13,642	Severe	Elevated	Elevated	High	High	High	Elevated	N/R	Elevated	N/R	Elevated	High	*Elevated*	*Severe*
Champaign	201,081	Severe	Severe	Elevated	High	High	Severe	Elevated	Guarded	Elevated	Elevated	Elevated	Elevated	High	High
Christian	34,800	High	High	Elevated	Elevated	High	Severe	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated
Clark	16,335	High	High	Elevated	High	High	High	Elevated	Guarded	Elevated	Guarded	Elevated	Elevated	*Guarded*	*High*
Clay	13,815	Severe		Elevated		High		Elevated		Elevated		High		Elevated	

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	County	State	County	State	County	State	County	State	County	State	County
Clinton	37,762	High	High	Elevated	Guarded	High	High	Guarded	N/R	High	N/R	Elevated	Elevated	High	Severe
Coles	53,873	Severe	Severe	Elevated	Elevated	Severe	High	Elevated	Guarded	Elevated	High	Elevated	High	High	Severe
Cook	5,194,675	Severe		High		Severe		Guarded		High		Guarded		High	
Crawford	19,817	Severe	Severe	*Elevated*	*Severe*	High	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	*Elevated*	*Severe*
Cumberland	11,048	High		Elevated		Severe		Elevated		Elevated		Elevated		Guarded	
DeKalb	105,160	High	Severe	Elevated	Elevated	High	Severe	Guarded	Guarded	Elevated	Elevated	Guarded	Guarded	Elevated	Guarded
De Witt	16,561	Severe		High		High		Elevated		Elevated		Elevated		Elevated	
Douglas	19,980	Severe	High	Elevated	High	High	Severe	Elevated	Guarded	Elevated	High	Elevated	Elevated	Elevated	Elevated
DuPage	916,924	Severe	Severe	High	Elevated	High	Severe	Guarded	Guarded	Elevated	High	Guarded	Guarded	Elevated	Elevated
Edgar	18,576	Severe		Elevated		High		Elevated		Elevated		Elevated		Elevated	
Edwards	6,721	Severe	Severe	Elevated	Elevated	High	Elevated	*High*	*Guarded*	Elevated	Elevated	Elevated	High	*Elevated*	*Severe*
Effingham	34,242	High		Elevated		High		Elevated		High		Elevated		Elevated	
Fayette	22,140	Severe		Elevated		High		Guarded		High		Elevated		Elevated	
Ford	14,081	Severe		Elevated		Severe		Guarded		Elevated		Guarded		Elevated	
Franklin	39,561	Severe	Severe	Elevated	Elevated	High	Elevated	Elevated	N/R	Elevated	N/R	High	High	Elevated	High
Fulton	37,069	Severe	High	*Elevated*	*Severe*	High	High	Guarded	Guarded	Elevated	Elevated	Guarded	Guarded	High	High
Gallatin	5,589	Severe	High	Elevated	High	High	High	Elevated	Elevated	Elevated	Elevated	High	High	Elevated	Elevated
Greene	13,886	Severe	Severe	Elevated	High	High	High	Guarded	Guarded	*High*	*Guarded*	Elevated	Elevated	Elevated	Elevated
Grundy	50,063	Severe	Severe	High	Elevated	High	Elevated	Guarded	Guarded	Elevated	Elevated	Guarded	Elevated	High	Severe

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	Count	State	County	State	County	State	County	State	County	State	County
Hamilton	8,457	Severe		Elevated		High		Elevated		Elevated		High		Elevated	
Hancock	19,104	Severe	Severe	Elevated	High	High	Elevated	High	Elevated	Elevated	Elevated	Guarded	Elevated	High	Severe
Hardin	4,320	High		Elevated		High		Elevated		High		High		Guarded	
Henderson	7,331	High	Elevated	*Elevated*	*Severe*	High	Severe	*High*	*Guarded*	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Henry	50,486	Severe	Severe	Elevated	Elevated	High	High	High	Elevated	Elevated	Elevated	Guarded	Guarded	High	High
Iroquois	29,718	Severe	Severe	Elevated	Elevated	High	Elevated	Guarded	Guarded	Elevated	Guarded	Guarded	Guarded	*Elevated*	*Severe*
Jackson	60,218	Severe	High	High	High	High	High	High	Elevated	Elevated	Elevated	High	High	Elevated	High
Jasper	9,698	Severe	Severe	Elevated	Elevated	High	High	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated	Elevated
Jefferson	38,827	Severe	High	Elevated	Elevated	High	Elevated	Elevated	N/R	High	N/R	High	Severe	*Elevated*	*Severe*
Jersey	22,985	High	High	Elevated	Elevated	High	High	Guarded	Guarded	High	High	Elevated	Elevated	Elevated	Elevated
Jo Daviess	22,678	Severe	Severe	Elevated	High	High	High	High	Elevated	Elevated	Elevated	Guarded	Guarded	Guarded	Guarded
Johnson	12,582	Severe	High	Elevated	High	High	Elevated	Elevated	N/R	Elevated	N/R	High	Severe	*Elevated*	*Severe*
Kane	515,269	Severe	Severe	Elevated	Elevated	High	Severe	Guarded	N/R	Guarded	N/R	Guarded	Guarded	Elevated	Elevated
Kankakee	113,449	Severe	Severe	Elevated	Guarded	High	Severe	Guarded	Guarded	Elevated	Elevated	Guarded	Guarded	High	High
Kendall	114,736	High	Severe	Elevated	Elevated	High	Elevated	Guarded	Guarded	Guarded	Guarded	Guarded	Guarded	*Elevated*	*Severe*
Knox	52,919	Severe	High	Elevated	Elevated	High	High	Guarded	N/R	Elevated	N/R	Guarded	Guarded	*Elevated*	*Severe*
Lake	703,462	Severe	Severe	Elevated	High	High	Severe	Guarded	Guarded	Guarded	Elevated	Guarded	Guarded	Elevated	High
La Salle	113,924	High	Severe	Elevated	Elevated	High	Severe	Guarded	Guarded	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Lawrence	16,833	High		Elevated		High		Elevated		Elevated		Elevated		Elevated	

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	County	State	County	State	County	State	County	State	County	State	County
Lee	36,031	High	High	Elevated	Elevated	High	High	Guarded	Guarded	Elevated	Guarded	Guarded	Guarded	Elevated	Elevated
Livingston	38,950	High	Severe	*Elevated*	*Severe*	High	High	Guarded	Guarded	Elevated	Guarded	*Elevated*	*Low*	*Elevated*	*Severe*
Logan	30,305	Severe		Elevated		High		Elevated		Elevated		Elevated		High	
McDonough	32,612	Severe	High	Elevated	Elevated	High	Elevated	*High*	*Guarded*	Elevated	Elevated	Guarded	Guarded	*Elevated*	*Severe*
McHenry	308,760	Severe	High	Elevated	Elevated	High	High	Guarded	Guarded	Guarded	Elevated	Guarded	Guarded	High	Elevated
McLean	169,572	Severe		Elevated		High		Elevated		Elevated		Guarded		High	
Macon	110,768	Severe		Elevated		High		Elevated		Elevated		Elevated		High	
Macoupin	47,765	Severe	High	Elevated	High	High	High	Guarded	N/R	High	N/R	Elevated	Guarded	*Elevated*	*Severe*
Madison	269,282	Severe	Severe	Elevated	High	High	High	Guarded	Guarded	High	High	Elevated	Elevated	High	High
Marion	39,437	Severe		Elevated		High		Guarded		High		High		Elevated	
Marshall	12,640	Severe	Severe	Elevated	Guarded	High	Severe	Elevated	Guarded	Elevated	High	Guarded	Guarded	Elevated	Elevated
Mason	14,666	High		Elevated		High		Elevated		Elevated		Guarded		Elevated	
Massac	15,429	Severe	*Guarded*	Elevated	High	High	Elevated	High	Elevated	Elevated	N/R	Elevated	N/R	*Elevated*	*Severe*
Menard	12,705	Severe	High	Elevated	High	High	High	Elevated	Guarded	Elevated	Guarded	Elevated	Guarded	*Elevated*	*Severe*
Mercer	16,434	Severe	High	*Elevated*	*Severe*	High	High	*High*	*Guarded*	Elevated	Guarded	Guarded	Guarded	Elevated	Elevated
Monroe	32,957	Severe	Severe	Elevated	High	High	High	Guarded	Guarded	High	High	High	Elevated	Elevated	Elevated
Montgomery	30,104	Severe	Severe	Guarded	Elevated	High	High	Guarded	Guarded	*High*	*Guarded*	Elevated	Guarded	Elevated	High
Morgan	35,547	Severe		High		High		Elevated		Elevated		Elevated		Elevated	
Moultrie	14,846	Severe		Elevated		High		Elevated		Elevated		Elevated		Guarded	

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	County	State	County	State	County	State	Count	State	County	State	County
Ogle	53,497	High	High	Elevated	Elevated	High	High	Guarded	Guarded	Elevated	Guarded	Guarded	Guarded	Elevated	Elevated
Peoria	186,494	Severe	High	*Elevated*	*Severe*	High	High	Elevated	Elevated	Elevated	Elevated	Guarded	Elevated	High	High
Perry	22,350	Severe	High	Elevated	High	High	Elevated	Elevated	N/A	High	N/A	High	High	*Elevated*	*Severe*
Piatt	16,729	Severe	Severe	*Elevated*	*Severe*	High	Severe	High	Elevated	Elevated	Elevated	Elevated	Guarded	Elevated	Guarded
Pike	16,430	High	Severe	Elevated	Elevated	High	High	Guarded	Guarded	High	Elevated	Elevated	Guarded	Elevated	Elevated
Pope	4,470	High		Elevated		High		Elevated		Elevated		High		Elevated	
Pulaski	6,161	High	Elevated	*Elevated*	*Severe*	High	Elevated	Elevated	N/R	Elevated	N/R	Severe	High	*Elevated*	*Severe*
Putnam	6,006	Severe	Severe	Guarded	Elevated	High	Severe	*High*	*Guarded*	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Randolph	33,476	High	High	Elevated	High	High	Severe	Guarded	Guarded	High	Elevated	High	High	Elevated	High
Richland	16,233	High	Severe	*Elevated*	*Severe*	High	Elevated	Elevated	Guarded	Elevated	Guarded	High	Elevated	Elevated	Elevated
Rock Island	147,546	Severe	Severe	Elevated	High	High	Severe	High	Elevated	Elevated	High	Guarded	Elevated	Elevated	High
St. Clair	270,056	Severe		Elevated		High		Guarded		High		High		High	
Saline	24,913	Severe	High	High	Severe	High	Severe	Elevated	High	Elevated	High	High	High	*Elevated*	*Severe*
Sangamon	197,465	Severe	Severe	High	Elevated	High	Severe	Elevated	Guarded	Elevated	High	Elevated	Elevated	High	High
Schuyler	7,544	Severe	Severe	Elevated	High	*High*	*Guarded*	Elevated	Guarded	Elevated	Guarded	Guarded	Guarded	*Elevated*	*Severe*
Scott	5,355	Severe		Elevated		High		Elevated		High		Elevated		Elevated	
Shelby	22,363	Severe		Elevated		High		Elevated		Elevated		Elevated		High	
Stark	5,994	High	Severe	Guarded	Guarded	High	Severe	Elevated	Guarded	Elevated	High	Guarded	Guarded	Elevated	Elevated
Stephenson	47,711	Severe	Severe	Elevated	Elevated	High	High	*High*	*Guarded*	Elevated	Elevated	Guarded	Guarded	Elevated	Elevated
Tazewell	135,394	Severe	High	*Elevated*	*Severe*	High	High	Elevated	Elevated	Elevated	Elevated	Guarded	Guarded	High	High
Union	17,808	Severe	High	Elevated	Elevated	High	Elevated	Elevated	N/R	Elevated	N/R	Severe	Severe	*Elevated*	*Severe*
Vermilion	81,625	Severe		Elevated		High		Elevated		Elevated		Elevated		High	
Wabash	11,947	Severe		Elevated		High		Elevated		Elevated		High		High	

County Name	Population	Severe Storms		Floods		Severe Winter Storms		Drought		Extreme Heat		Earthquake		Tornado	
		State	County	State	County	State	County	State	County	State	County	State	County	State	County
Warren	17,707	Severe		Elevated		High		High		Elevated		Guarded		Elevated	
Washington	14,716	Severe		Elevated		High		Guarded		High		High		Elevated	
Wayne	16,760	Severe		Elevated		High		Elevated		Elevated		High		Elevated	
White	14,665	Severe	High	High	Severe	High	Elevated	Elevated	Guarded	Elevated	N/R	High	High	*Elevated*	*Severe*
Whiteside	58,498	Severe		Elevated		High		High		Elevated		Guarded		Elevated	
Will	677,560	Severe	Severe	High	High	High	Severe	Guarded	Elevated	Guarded	Elevated	Guarded	Guarded	High	High
Williamson	66,357	Severe	Severe	Elevated	High	High	High	Elevated	Guarded	Elevated	Guarded	High	Severe	High	Severe
Winnebago	295,266	Severe	High	High	Elevated	High	Elevated	Guarded	Elevated	*High*	*Guarded*	Guarded	Guarded	Elevated	Elevated
Woodford	38,664	Severe	High	Elevated	Elevated	High	High	Elevated	Guarded	Elevated	Elevated	Guarded	Guarded	Elevated	High

Disaster Mitigation Act of 2000 Local Plan Guidance
NOTE TO LOCAL JURISDICTIONS

The State of Illinois has developed and is using the following Hazard Rating Process in the State Mitigation Plan. This process is being shared as a guide for local jurisdiction review and use. You may be required to supply jurisdiction-specific data for your local plan. A local jurisdiction can use this general process and supply detailed hazard specific data. Currently the State has a broad general picture and will use this specific information to develop more detail in future revisions. By using this format the efforts of the local governments can be easily integrated into the State's Hazard Analysis. Supplying this process is meant to start your thinking and data collection. Information available on the IEMA Mitigation website may not provide information that is detailed enough for a local plan.

ILLINOIS HAZARD RATING PROCESS

There are four categories (Historical/Probability, Vulnerability, Severity of Impact and Population) that will identify and define the ratings of each hazard, noted in the five tables on the next three pages. The first table will identify what has occurred in the past as a guide to projecting the probability for future occurrences. The second table will identify the number of citizens who might be impacted based on individual criteria identified in the methodology. The third table will estimate the severity by considering health and safety, continuity of operations, property, facilities, infrastructure, environment, economic and financial situation. The fourth category is population with two tables: table 4A is based on the 2010 census population and table 4B is based on the projected population growth for the next ten years.

The first three tables are weighted three times as much as the last two tables combined. Each hazard (for example flood) will have a score from each of the five tables. The score to be used for low, medium and high is identified in each table. This last column under each hazard will be the total overall score of the five tables, as shown on the next page:

Low – 0 to 12 (green)

Guarded – 13 to 24 (blue)

Elevated – 25 to 36 (yellow)

High – 37 to 48 (orange)

Severe – 49 to 60 (red)

For example under flood there will be a number from each of the five tables. These five numbers will be totaled to arrive at the overall risk for floods. This rating process is being done by county for all major natural hazards in Illinois. These numbers will be transferred onto a separate spreadsheet by county and colored coded as indicated above to readily indicate the hazard ratings.

1) HISTORICAL/PROBABILITY (frequency)

-The number of times that a disaster has occurred in a jurisdiction in the past 50 years

-The information is being used to determine and evaluate the likelihood for future disasters

Low (6)	0 to 12 occurrences in the last 60 years
Medium (12)	12 to 60 occurrences in the last 60 years
High (18)	More than 60 occurrences in the last 60 years

2) VULNERABILITY (percentage of people)

-The relationship of where people live in or near the hazard area

-The percentage of people that will be adversely affected should the hazard occur

Low (6)	Less than 10% of the total population of the jurisdiction
Medium (12)	10% to 25% of the total population of the jurisdiction
High (18)	More than 25% of the total population of the jurisdiction

3) SEVERITY OF IMPACT (injuries, fatalities, personal property & infrastructure)

-The worst conceivable impact to human life and property which could result from a hazard

-The essential facilities are defined for this purpose as PUBLIC SAFETY (fire, police & local government) and UTILITIES (electric, gas, telephone water & sewer)

Low (6)	Minor injuries (under 50) & property damage (under $1,000,000), or less than 24 hour shutdown of essential facilities
Medium (12)	Serious injury (more than 50), major property damage (structural stability) ($1,000,001 to $15,000,000), or 24 to 72 hour shutdown of essential facilities
High (18)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (More than $15,000,000), or more than 3 days of shutdown for essential facilities

POPULATION–COMBINED FOURTH CRITERIA based on 1/3 the value of the above tables. The committee was instructed to include growth as a factor for the risk assessment. After a review of the data the committee concluded that giving the future growth equal weight with the other factors skewed the risk assessment. Counties range in population from approximately 5,000 to 5,000,000. To say a population growth of 25% in a smaller county (1, 250) would have more of an impact than a larger county with 10% growth (500,000) was not acceptable to the committee.

The committee also determined that because of the large population disparity between counties the Vulnerability and Severity of Impact didn't fully distinguish the quantity of people that could be exposed to risk. The committee decided to give the population of the counties equal weight with the growth factor.

The planning committee discussed the impact of population on the risk assessment at length. While population is acknowledged to be an important factor to be considered, it is of lesser significance than the first three criteria and has been assigned 1/3 the value. On a scale of 100 the first three tables would receive 30 each and the remaining 10 was allocated to population.

4A) POPULATION (number in jurisdiction)

-The actual 2000 population census figure per jurisdiction

-The quantity will be used to identify a slight increase in risk

Low (1)	0 to 100,000 population in the jurisdiction
Medium (2)	100,001 to 500,000 population in the jurisdiction
High (3)	More than 500,000 population in the jurisdiction

4B) POPULATION GROWTH (percentage of increase)

-The projected population growth in a jurisdiction over the next 10 years

-The population growth estimates will be used to identify a potential increase to risk

Low (1)	% of decrease to 10% projected population increase in the jurisdiction
Medium (2)	11% to 25% projected population increase in the jurisdiction
High (3)	More than 25% projected population increase in the jurisdiction

HAZARD WORKSHEET METHODOLOGY

Sixty two years of Illinois hazard data (1950-2012) was obtained from the National Climatic Data Center and Spatial Hazard Events and Losses Database for the United States (SHELDUS) for severe storms (thunderstorms, high wind, lightning and hail) and tornadoes, floods, severe winter storms, drought, and extreme heat. The Illinois State Geological Survey was able to supply an equivalent time frame of data for earthquake activity in Illinois. The INHMP Risk Assessment examines natural disasters on a statewide basis and as well as individual counties. Natural hazards include those caused by climatological, geological, hydrologic, or seismic events. A variety of data sources were reviewed to obtain additional information regarding past occurrences in order to create the most comprehensive list possible. These data sources include: Illinois Emergency Management Agency (IEMA), Federal Emergency Management Agency (FEMA), Illinois State Water Survey (ISWS), US Geological Atmospheric Administration (USGS), Illinois State Geological Survey (ISGS), Illinois Department of Natural Resources (IDNR), US Army Corps of Engineers, the Spatial Hazard Events and Losses Database for the United States (SHELDUS) and the National Climatic Data Center (NCDC). All of this information has been entered into a spreadsheet database for ease of information analysis and for using GIS mapping capabilities to display and identify Illinois hazard areas. The database was broken down by individual hazard occurrence by county. This database will be continually updated by mitigation staff, in order to

maintain an accurate and active collection of previous occurrences. This database will also be an available planning tool for local jurisdictions.
Historical/probability– An average of the number of events that have occurred since 1950.

- **Vulnerability**– Severe Storm–All counties are susceptible to severe storms. At any one time, it has been determined that over 25% of the county population might experience severe storms. This determination is supported by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, as follows: "Damage from severe thunderstorms is usually on a much broader spatial scale in the state of Illinois. . Illinois averages more than 500 reports of wind damage and nearly 375 reports of large hail annually. Approximately 80% of the severe thunderstorms are multicellular or a supercell hybrid, which are capable of producing damaging wind and/or large hail over approximately a 400 to 500 square mile area. The remainder of severe thunderstorms are squall lines, which can produce damage over 100% of the affected counties. Thus, the vulnerability to severe thunderstorms should be high (greater than 25% of the population affected) in each county across Illinois. This is reinforced by a study done by Stanley Chagnon of Chagnon Climatologist, in his publication *"Thunderstorms Across the Nation - An Atlas of Storms, Hail, and Their Damages in the 20th Century"*. This study indicated that in an analysis of thunderstorm caused catastrophes, Illinois ranked 4th in the United States in total thunderstorm catastrophes between 1949 and 1998."
- Tornado–While all of Illinois is susceptible to tornadoes (in fact north, south, east and west counties have all been hit by tornadoes) it is estimated less than 10% of a county would be impacted by a tornado at any one time. This estimation is supported by Mr. Chris Miller, WCM, National Weather Service, Lincoln, IL, as follows: "Based on data of tornadoes in the state of Illinois for the 57 year period from 1950 – 2011, nearly 77%were rated as weak tornadoes (EF0/EF1), 22%were rated as strong tornadoes (EF2/EF3), and 1%were rated as violent tornadoes (EF4/EF5) on the Enhanced Fujita damage assessment scale. The data also suggests that weak tornadoes are typically 60 yards wide with a path length of 2 miles, strong tornadoes are usually 200 yards wide with a path length around 10 miles, with violent tornadoes around 1/4 mile wide and path lengths greater than 20 miles. This would mean that with nearly 2205 tornadoes reported, approximately 825 square miles of Illinois have been affected by tornadoes." "Considering that Illinois is nearly 56,000 square miles in size, with the average county around 545 square miles, the average population affected has been about 1.5%. Thus, every county in Illinois should have a "Low" vulnerability to tornadoes, (low being defined as less than 10% of the total population)."

- Flood–History supports the assumption that all counties in Illinois are susceptible to some type of flooding. As stated above in the tornado analysis, it is estimated that 10% of a county would be impacted by flooding at any one time. Illinois

Department of Natural Resources provided information on the 100 Year Floodzone in Unincorporated Areas ranging from 52.1% to 2.7% of the county being in the 100 year floodzone with the average being 13.5%. In general, incorporated areas would have a lower average floodzone; therefore, 10% was used for the overall county average.

- Drought–In general, farmers are the first group to feel the impact of a drought. Besides causing stress to crops and livestock, many farmers rely on their own dug wells or wells drilled into shallow aquifers for their water supply. Both types of wells are very vulnerable to drought conditions. Public water supplies are typically more robust against drought but are not immune from long-term drought conditions. Public water supplies that rely on surface water supplies are historically more vulnerable to drought than those that rely on deep aquifers. The Illinois State Water Survey has produced a document dealing with drought and drought planning. The reference is *The Water Cycle and Water Budgets in Illinois: A Framework for Drought and Water-supply Planning (*Illinois State Water Survey, 2006, ISWS IEM 2006-02).

- Extreme Heat-The most at risk population is the sickly and the elderly. We have arbitrarily identified the elderly population by county and used this as the basis. As stated earlier the young people in poor health are also at risk. The assumption is made that the young people in poor health will be offset by the healthy elderly.

- Severe Winter Storm–One hundred percent of the population is at risk from a severe winter storm in the State of Illinois.

- Earthquake–The Applied Technology Council (ATC) has prepared a publication on rapid visual screening of seismically hazardous buildings. The National Earthquake Hazards Reduction Program Map (FEMA 154, Second Edition, 2002) for Illinois from this publication was used.

Severity of Impact–The various detailed parameters are identified in this table. When evaluating each county based on the 60+ year history, if there is any conflicting data the highest level will be assumed. In keeping with this philosophy and since the worst known earthquake (1811-1812) occurred outside of the 60+ year period of time, the decision was made to overlay the ATC map with the Modified Mercalli Scale Map (Modified Mercalli Intensities based on a 7.6 Magnitude Earthquake along the New Madrid Seismic Fault) to evaluate Illinois counties.

Population–The Illinois Department of Commerce and Economic Opportunity provided the 2010 census population and the projected population growth by county through 2015. This information was used in supplying information for the fourth and fifth tables. Using the tables in this rating process, the information has been extracted and analyzed in the following manner:

HAZARD RATING

_____COUNTY

KEY: (LOW 0-12), (GUARDED 13-24), (ELEVATED 25-36), (HIGH 37-48) AND (SEVERE 49-60)

City, County or Multi-Jurisdictional	Population	Severe Storms	Floods	Severe Winter Storms	Drought	Extreme Heat	Earthquake	Tornado

NOTE TO LOCAL JURISDICTIONS

LOCAL RISK ASSESSMENT

Three forms dealing with risk assessment shall be submitted with the mitigation plan to the State for approval. The State will compile this information from the local jurisdictions into the State Hazard Mitigation Plan. The assumption will be made that since the locals are doing a more detailed analysis of the local risk that their risk assessment is the more accurate. The State reserves the right to re-analyze the risk assessment data to determine the most accurate level of risk.

1) Worksheet #3a – In preparing the risk assessment for the jurisdiction it is necessary for this worksheet to be completed. Make an extra copy of this worksheet to be submitted to the State when the local mitigation plan is submitted for approval. This worksheet and the instructions for completing this worksheet may be found in "State and Local Mitigation Planning how-to guide", FEMA 386-2. This document is on the IEMA Mitigation website and may be obtained from the State Hazard Mitigation Officer (SHMO).

2) Potential Structure Losses for Floods–This form will be required if flooding is a hazard for the jurisdiction. Much of this information can be taken from Worksheet #3a, Worksheet #3b and Worksheet #4 that are found in "State and Local Mitigation Planning how-to guide", FEMA 386-2.

   The definition for a critical facility is **Emergency Operations Center (EOC), Courthouses, Police and Fire Stations, Rescue/Ambulance Service, Medical Facilities** (hospital, nursing home and medical clinic)**, Utilities** (water, sewer, electric and gas) and **Transportation Facilities** (critical roads, bridges, airport, and port).

3) Potential Structure Losses for Earthquakes–This form will be required if the earthquake hazard rating for the jurisdiction is elevated, high or severe. Much of this information can be taken from Worksheet #3a, Worksheet #3b and Worksheet #4 that are found in "State and Local Mitigation Planning how-to guide", FEMA 386-2.

Critical Facilities for the jurisdiction should be listed on this form. The information for these critical facilities shall include the **name, most accurate physical address and, if possible, latitude and longitude** for mapping purposes (i.e. no post office boxes, etc). A critical facility is defined as **Emergency Operations Center (EOC), Courthouses, Police and Fire Stations, Rescue/Ambulance Service, Medical Facilities** (hospital, nursing home and medical clinic)**, Utilities** (water, sewer, electric and gas) and **Transportation Facilities** (critical roads, bridges, airport and port).

Type of Structure code for the critical facilities shall be taken from the table on the next page. This table has been developed from the "Second Edition Rapid Visual Screening of Buildings for Potential Seismic Hazards: A Handbook", FEMA 154/March 2002, publication.

TYPE OF STRUCTURE

CODE	BUILDING IDENTIFIER	CHARACTERISTICS
1	Wood Buildings	• **Light wood frame residential and commercial buildings equal to or smaller than 5,000 sq. ft. (W1)** Wood stud walls are typically constructed of 2-inch by 4-inch vertical wood members set about 16 inches apart (2-inch by 6-inch for multiple stories). Most common exterior finish materials are wood siding, metal siding or stucco. • **Light wood frame buildings greater than 5,000 sq. ft. (W2)** These are large apartment buildings, commercial buildings or industrial structures usually of one to three stories and rarely, as tall as six stories.
2	Steel Buildings	• **Steel moment-resisting frame (S1)** Typical steel moment-resisting frame structures usually have similar bay widths in both the transverse and longitudinal directions, around 20-30 ft. The floor diaphragms are usually concrete, sometimes over steel decking. This structural type is used for commercial, institutional and public buildings. • **Braced steel frame (S2)** These buildings are braced with diagonal members, which usually cannot be detected from the building exterior. Braced frames are sometimes used for long and narrow buildings because of their stiffness. • **Light metal building (S3)** The structural system usually consists of moment frames in the transverse direction and braced frames in the longitudinal direction, with corrugated sheet-metal siding. In some regions, light metal buildings may have partial-height masonry walls. The interiors of most of these buildings do not have interior finishes and their structural skeleton can be seen easily.

CODE	BUILDING IDENTIFIER	CHARACTERISTICS
2	Steel Buildings Continued	• **Steel frames with cast-in-place concrete shear walls (S4)** Lateral loads are resisted by shear walls, which usually surround elevator cores and stairwells, and are covered by finish materials. An interior investigation will permit a wall thickness check. More than six inches in thickness usually indicates a concrete wall. • **Steel frames with unreinforced masonry infill walls (S5)** Steel columns are relatively thin and may be hidden in walls. Usually masonry is exposed on exterior with narrow piers (less than 4 ft. wide) between windows. Portions of solid walls will align vertically. Infill walls are usually two to three wythes thick. Veneer masonry around columns or beams is usually poorly anchored and detaches easily.
3	Concrete Buildings	• **Concrete moment-resisting frames (C1)** All exposed concrete frames are reinforced concrete (not steel frames encased in concrete). • **Concrete shear wall buildings (C2)** Concrete shear-wall buildings are usually cast in place, and show typical signs of cast-in-place concrete. Shear-wall thickness ranges from 6 to 10 inches. • **Concrete frames with unreinforced masonry infill walls (C3)** Concrete columns and beams may be full wall thickness and may be exposed for viewing on the sides and rear of the building. Usually masonry is exposed on the exterior with narrow piers (less than 4 ft. wide) between windows. Portions of solid walls will align vertically. This type of construction was generally built before 1940 in high-seismicity regions but continues to be built in other regions.

CODE	BUILDING IDENTIFIER	CHARACTERISTICS
4	Precast Concrete Buildings	• **Tilt-up Buildings (PC1)** Tilt-ups are typically one or two stories high and are basically rectangular in plan. Exterior walls were traditionally formed and cast on the ground adjacent to their final position, and then "tilted-up" and attached to the floor slab. The roof can be a plywood diaphragm carried on wood purlins and glulam beams or a light steel deck and joist system, supported in the interior of the building on steel pipe columns. • **Precast concrete frame buildings (PC2)** Precast concrete frames are, in essence, post and beam construction in concrete. Structures often employ concrete or reinforced masonry (brick or block) shear walls.
5	Masonry Buildings	• **Reinforced masonry buildings with flexible diaphragms (RM1)** • **Reinforced masonry buildings with rigid diaphragms (RM2)** Walls are either brick or concrete block. Wall thickness is usually 8 inches to 12 inches. Interior inspection is required to determine if diaphragms are flexible or rigid. The most common floor and roof systems are wood, light steel, or precast concrete. • **Unreinforced masonry buildings (URM)** These buildings often used weak lime mortar to bond the masonry units together. Arches are often an architectural characteristic of older brick bearing wall buildings. Other methods of spanning are also used, including steel and stone lintels. Unreinforced masonry usually shows header bricks in the wall surface.

Worksheet #3a — Inventory Assets — step 3

Date: *What will be affected by the hazard event?*

Task A. Determine the proportion of buildings, the value of buildings, and the population in your community or state that are located in hazard areas.

Hazard _____

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazard Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential									
Commercial									
Industrial									
Agricultural									
Religious/ Non-profit									
Government									
Education									
Utilities									
Total									

Task B. Determine whether (and where) you want to collect additional inventory data.

	Y	N
1. Do you know where your greatest damages may occur in your hazard areas?	____	____
2. Do you know whether your critical facilities will be operational after a hazard event?	____	____
3. Is there enough data to determine which assets are subject to the greatest potential damages?	____	____
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards?	____	____
5. Is there enough data to determine whether certain areas of historic, environmental, political, or cultural significance are vulnerable to potential hazards?	____	____
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence?	____	____
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives?	____	____

POTENTIAL STRUCTURE LOSSES FOR FLOODS

_____COUNTY

City, County or Multi-Jurisdictional	Assessed Vulnerability	Estimated # of People	% of Structures in Floodplain	# of Repetitive Loss Properties	# Estimated Residential Losses	$ Estimated Residential Losses	# Estimated Commercial Losses	$ Estimated Commercial Losses	# Estimated Industrial Losses	$ Estimated Industrial Losses	# of Critical Facilities	Relative Losses (High, Med., Low)

POTENTIAL STRUCTURE LOSSES FOR EARTHQUAKES

_____COUNTY

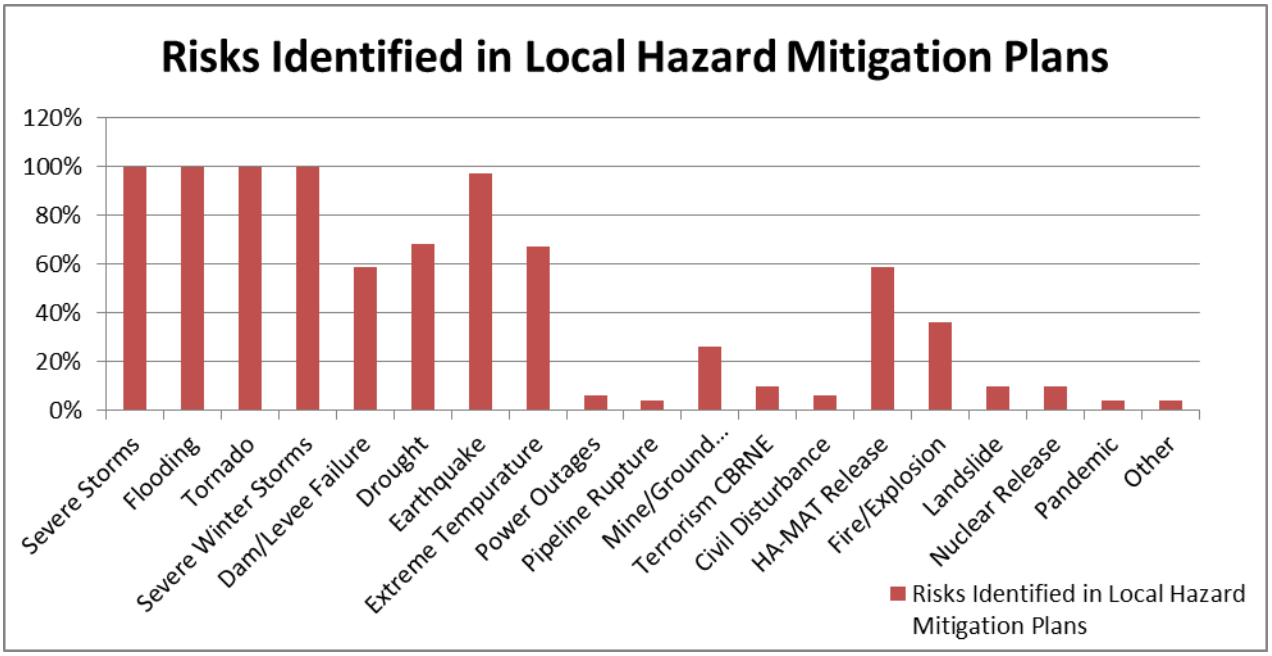
City, County or Multi-Jurisdictional	Assessed Vulnerability	Estimated # of People	# of Estimated Residential Losses	$ Estimated Residential Losses	# of Estimated Commercial Losses	$ Estimated Commercial Losses	# of Estimated Industrial Losses	$ Estimated Industrial Losses	# of Critical Facilities (CF)	# of Critical Facilities (CF) out-of-service	$ Estimated Losses to Critical Facilities (CF)	Type of CF Structure	Relative Losses (High, Med., Low)

Local Hazard Mitigation Plan Risk Assessments

Local jurisdictional hazard risk assessments were conducted utilizing a variety of different methods. Assessments conducted at the local level tend to provide a unique and detailed approach to the assessment that the INHMP cannot emulate. Following are correlations that have been identified utilizing LHMPs that have been provided from each jurisdiction. All counties that were covered by plans have been considered in this list, in terms of their top hazards and any areas of significant development pressure. This section however, is not intended to definitively prioritize the jurisdictions with regards to one another, but represents concerns from these local jurisdictions. This list provides that opportunity to incorporate and correlate the in depth assessments from the local plans into the INHMP. To research individual county information in detail, all FEMA approved hazard mitigation plans are listed on our IEMA website. The State analyzes information from local risk assessments for use in an effort to supplement the risk assessment in the INHMP. A detailed description of this analysis and correlation can be found in Section III of the INHMP. The following pages provide highlights of best practices from local hazard mitigation plans that do a good job of risk assessments for specific hazards, while analyzing the hazards and risks identified in Illinois' local hazard mitigation plans.

The majority of hazards identified in LHMP mirror those identified in the INHMP. The most commonly identified hazards include: severe storms (thunderstorms), tornados, floods and severe winter storms which are represented as potential hazards in 100% of the LHMPs. Over 97% of Illinois LHMPs have identified earthquakes in their rankings. Drought and extreme temperatures were moderately addressed in the LHMPs at approximately 67%, while dam/levee failure was addressed in approximately 59% of the plans.

There are 28 hazards identified in the 69 LHMPs reviewed. Although LHMP guidance does not require human-caused hazards or technological hazards to be identified, over 58% of the LHMP included such hazards. The most popular non-natural hazard addressed in the LHMP was hazardous materials (HAZ-MAT) release. HAZ-MAT releases were listed as a hazard for the local jurisdictions in 59% of the LHMPs.



The following table represents the hazards identified in Illinois's LHMPs.

Hazards Identified in LHMPs

Tornado	Earthquake
Severe Storms	Pipeline Ruptures
Drought	Transportation Accidents
Fire/Explosions	Hazardous Material Spill
Black Outs/Power Outages	Dam/Levee Failure
Structure/Building Collapse	Flooding
Storm/Wastewater Infrastructure Flooding	Terrorism (CBRNE)
Cyber Incident	Civil Disturbance
Extreme Temperatures	Sewer Back-ups
Severe Winter Storms	Wastewater Flooding
Mine Subsidence	Nuclear Release
Erosion	Waste Remediation
Ground Subsidence	Pandemics
Landslide	Wildfire

As identified in the FEMA Local Multi- Hazard Mitigation Guidance, "The overall intent of the hazard identification or risk assessment is to provide the factual basis for activities proposed in the strategy that will reduce losses from identified hazards. A quality assessment makes a clear connection between the community's vulnerability and the hazard mitigation actions. In other words, it provides sufficient information to enable the jurisdiction(s) to identify and prioritize appropriate hazard mitigation actions. Local risk assessments do not need to be based on the most sophisticated technology, but do need to be accurate, current, and relevant." LHMP's in Illinois provide a detailed description of the type, location and extent of all the natural hazards that affect the jurisdiction, while including information on previous occurrences. Multi-jurisdictional LHMPs have the unique task of providing detailed information regarding each individual jurisdiction's risks where they vary from the risks facing the entire planning area. In addition, future land use descriptions and development trends within the communities are difficult incorporate into LHMPs with sufficient detail. However, this type of forward thinking is imperative in planning efforts, so that mitigation options can be considered in future land use decisions. Below are examples, of detailed risk assessments and strong descriptions of land uses and development trends, that are specific to each jurisdiction participating in the plan development. This detailed jurisdictional assessment allows for each jurisdiction to truly rank and assess the risk impacting them individually, while providing a strong foundation for developing mitigation actions to reduce or limit the impact of these hazards.

Local Hazard Mitigation Plan Best Practice Examples:

Risk Assessment- Hazard Ranking: Jurisdictional Specific

44 CFR 201.6(c)(2)(iii) of the Local Multi-Hazard Mitigation Planning Guidance requires that the risk assessment for multi-jurisdictional plans must assess each jurisdiction's risks where they vary from the risks facing the entire planning area. The guidance requires risk assessment information for the planning area as a whole. However, there may be communities or areas within the county that have a greater risk to an identified hazard than others. Identifying these unique risks to specific communities in vital in properly prioritizing mitigation actions for each specific community. The larger the planning area and the more communities participating in a plan, the more likely that unique and varied risk will occur. A prime example of this would be the risk of flooding. Flooding hazards do not affect an entire county jurisdiction proportionally. Some communities have a higher risk of flooding than others, which should subsequently be reflected in the mitigation strategies. Below is a portion of the Piatt County LHMP that provides a good example of community specific risk assessment. As seen in the results, the hazard rankings do differ

slightly from community to community. In addition, the plan has identified the top three most significant hazards affecting the county. This identification allows the county to more accurately prioritize their mitigation efforts to address the most significant hazards.

Piatt County- Plan Approved February 14th, 2013

(Hazard Ranking Methodology-Jurisdictional Specific)

The planning team reviewed historical hazards information and participated in a risk analysis using a projector and Excel spreadsheet. The spreadsheet listed the compiled NCDC data for each community.

The spreadsheet calculated the probability rating (Low, Medium, High) of each hazard based on the number of events that have occurred in the county within the past 50 years. Throughout the planning process, the MHMP team had the opportunity to update the NCDC data with more accurate local information. For example, the NCDC records often list the locations of hazards such as floods under the county, not accounting for how the individual communities were affected. In such situations, the probability rating assigned to the county was applied to all jurisdictions within the county.
Team consensus was also important in determining the probability of hazards not recorded by NCDC, for example dam and levee failure and hazardous materials spills. The probabilities for these hazardous events were determined by the planning team's estimation, derived from local experience and records, of the number of historical events that have occurred within the past 50 years. The probability ratings are based on the following guidelines:

- Low = 0 - 5 events
- Medium = 6 - 15 events
- High = 16 + events

After improving the NCDC data with additional local data, the team determined each hazard's potential impact on the communities. The impact rating (Minimal, Moderate or Significant) was based on the following guidelines.

- Minimal = Few injuries
Critical facilities shut down for 24 hours
Less than 15% of property damaged
- Moderate = Multiple injuries
Critical facilities shut down for 1-2 weeks
At least 30% of property damaged
- Significant = Multiple deaths
Critical facilities shut down for more than 1 month
More than 50% of property damaged

Finally, the overall hazard risk was determined by multiplying probability and impact. It is important to consider both probability and impact when determining risk. For example, if an asteroid were to collide with Earth, the impact would be extreme; but the probability of a catastrophic asteroid strike (has not happened in billions of years) is so small that the overall risk would be extremely low. In human history, there has never been a recorded fatality attributed to meteor collusion. In contrast, other potentially damaging events like tornados, thunderstorms and floods are relatively less severe but occur more frequently throughout Illinois and Piatt County.

The planning team identified severe thunderstorms, winter weather, and flooding as the three most significant hazards affecting Piatt County. The team also determined the risk of dam and levee failure was negligible so no risk analysis was discussed. The planning team also decided the risk of Ground failure/subsidence was insignificant. The hazard rankings are listed below in Table 4-3.

Table 4-3: Piatt County Hazards

HAZARD CATEGORIES	HAZARD PROBABILITY	HAZARD IMPACT	HAZARD RISK
	(Low, Medium, High)	*(Minimal, Moderate, Significant)*	*(Low, Moderate, Severe)*
Piatt County (ALL)			
Tornado	High	Minimal	Low
Flood	High	Moderate	Severe
Earthquake	Low	Minimal	Low
Severe Thunderstorm	High	Significant	Severe
Winter Weather	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Low	Moderate	Low
Structural Failure & Fires	Low	Significant	Moderate
ATWOOD			
Tornado	High	Moderate	Severe
Flood	Low	Moderate	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Low	Moderate	Low
Structural Failure & Fires	Low	Significant	Moderate
BEMENT			
Tornado	High	Moderate	Severe
Flood	Low	Moderate	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Medium	Significant	Moderate
Structural Failure & Fires	Low	Significant	Moderate
CERRO GORDO			
Tornado	High	Moderate	Severe
Flood	Low	Moderate	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Low	Significant	Moderate
Structural Failure & Fires	Low	Significant	Moderate
CISCO			

HAZARD CATEGORIES	HAZARD PROBABILITY	HAZARD IMPACT	HAZARD RISK
Tornado	High	Moderate	Severe
Flood	Low	Minimal	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Low	Moderate	Low
Structural Failure & Fires	Low	Significant	Moderate
DELAND			
Tornado	High	Moderate	Severe
Flood	Low	Minimal	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Low	Minimal	Low
Structural Failure & Fires	Low	Minimal	Low
HAMMOND			
Tornado	High	Moderate	Severe
Flood	Medium	Moderate	Moderate
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Medium	Significant	Moderate
Structural Failure & Fires	Low	Minimal	Low
MANSFIELD			
Tornado	High	Moderate	Severe
Flood	Low	Moderate	Low
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	Medium	Significant	Moderate
Structural Failure & Fires	Low	Moderate	Low
MONTICELLO			
Tornado	High	Significant	Severe
Flood	High	Significant	Severe
Earthquake	Low	Minimal	Low
Severe Thunderstorm/Hail/ Lightning/High Wind	High	Significant	Severe
Winter Weather (snow & ice)	High	Significant	Severe
Drought/Extreme Heat	Medium	Moderate	Moderate
Hazardous Materials Release	High	Significant	Severe
Structural Failure & Fires	Medium	Significant	Moderate

Risk Assessment –Repetitive Loss Information

Local Multi-Hazard Mitigation Planning Guidance requires that the risk assessment in all plans approved after October 1, 2008 address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods. This requirements intent is to inform hazard mitigation actions for properties that have suffered repetitive damage due to flooding, particularly problem areas that may not be apparent on floodplain maps. Below are portions of the Lake County LHMP Update that discuss in detail the repetitive loss information and problem area within the county. The plan discusses in detail watersheds within the county and the unique problem areas within each watershed. The repetitive loss information identified in the plan also provides a breakdown of structures that have been mitigated and the remaining properties impacted.

Lake County- Plan Approved July 26th, 2012

(Repetitive Loss Information and Flood Hazard Profile)

3.3.2 Flood Hazard Profile

Exhibit 3-2 shows mapped regulatory floodplains and floodways in Lake County, which cover 52,100 acres. Mapped regulatory floodplains are defined as the area of land, which is inundated with water during 100-year flood events. For a historical comparison of flooding in Lake County, the USGS Hydrologic Atlas (1963, 1968) places 52,898 acres within areas inundated as part of today's regulatory floodplains and floodways. Lake County has also identified 428 areas that cover 7,956 acres of land with local drainage and flooding problems. Over half of these areas reside outside of regulatory floodways and floodplains. Table 3-11 shows the percent of area land use in the Lake County 100-year floodplain, and a summary of the floodplain land area is shown in Table 3-12.

Table 3-11 Floodplain Land Use

Floodplain Land Use	Percent of Floodplain
Agriculture	2.7
Disturbed Land	0.3
Water	33.5
Wetland	23.9
Industrial	0.2
Open Space	32.8
Commercial	1.2
Residential	3.6
Government	1.9

Table 3-12 Lake County Estimate of Flood Prone Land

Flood Areas	Acres	Square Miles	% of County Area
Floodplains and Floodways	52,108	81.42	17%
Flood of Record	52,898	82.65	18%

Source: Lake County Regional Framework Plan 2001

The floodplains mapped in Exhibit 3-2 and the data in Table 3-12 have been developed from the FEMA Flood Insurance Rate Maps (FIRMs) for Lake County and the Lake County Flood Insurance Study (FIS) is dated November 16, 2000. FEMA and IDNR have developed preliminary GIS-based floodplain maps for Lake County. As of April 2012, a letter of final determination has not been issued by FEMA, which means that the November 16, 2000 FIS and associated FIRMs are still the effective FIS and floodplain maps for Lake County.

SMC Flood Problem Areas Inventory: In 1995 – 1996, the SMC conducted a flood damage inventory to identify flood problem areas. This was done with contacts and personal interviews with cities, villages, townships, home owner associations, county agencies, county board members, private organizations and individuals.

Problem sites were identified by subwatersheds and numbered. A standardized "Flood Problem Areas" information worksheet was developed for each site and pertinent information was added as it was obtained. A resident input questionnaire was also developed to gather additional information on local flooding problems.

The problem areas were included on the County's GIS. Over 300 identified flood problem sites were field inspected to verify problem area boundaries, assess the flood problem, and identify suitable mitigation solutions for the flood hazard area. The inventory only identifies areas experiencing historic flood damage to property and infrastructure. Flooding of open space and vacant land were not inventoried or mapped.

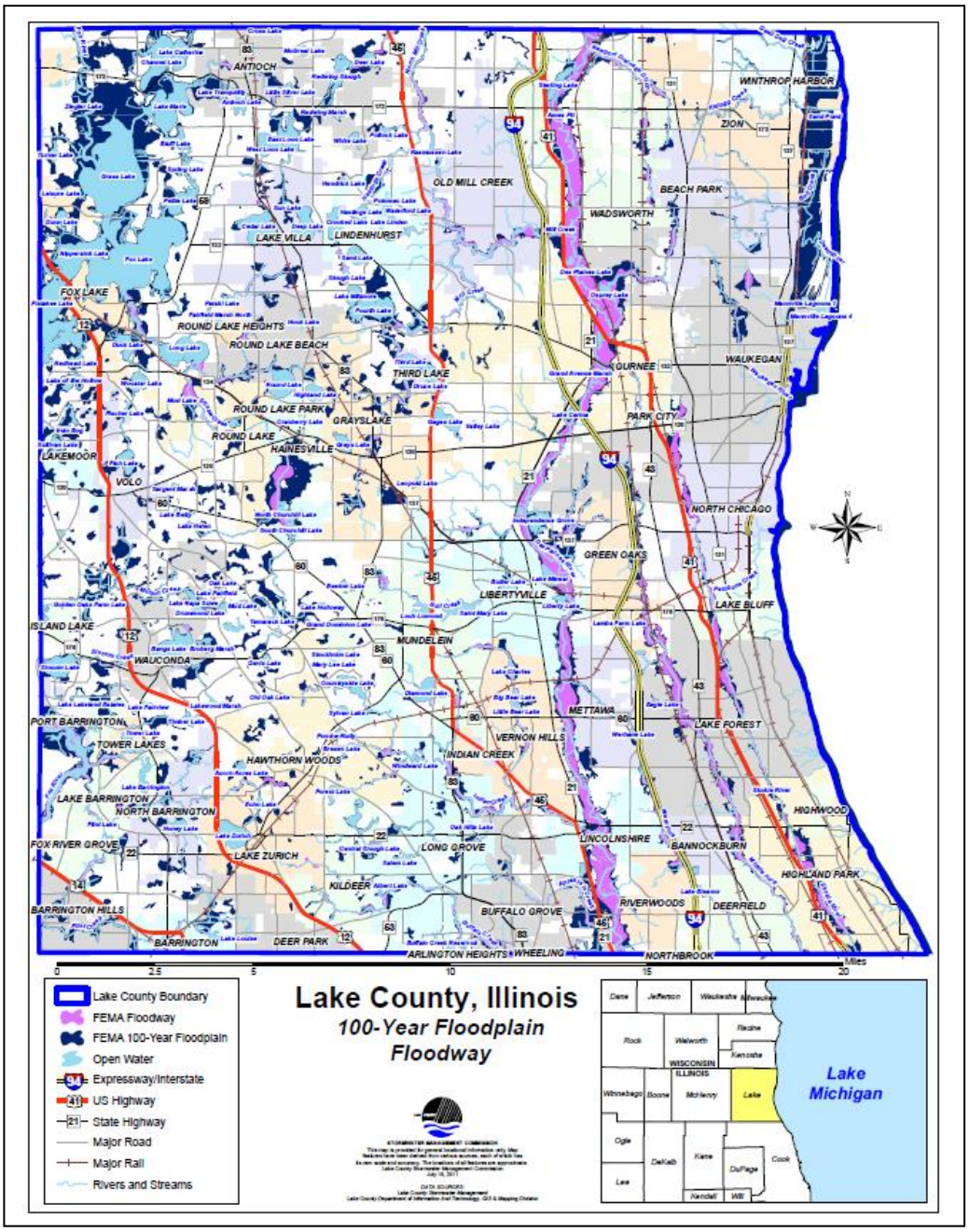


Exhibit 3-2 Lake County 100 Year Floodplain and Floodway

The flood problems areas and inventory data was used for the development of the 2004 Draft Lake County Flood Mitigation Plan. A summary of the problems area inventory is provided in Table 3-13 for the major Lake County watersheds and Exhibit 3-3 shows the mapped flood problem areas. More detailed information can be found in that Flood Mitigation Plan. Note that a flood problem site may include multiple buildings, roads or other infrastructure, and than one type of flooding may occur at a problem site.

Table 3-13 Lake County Flood Problem Area Inventory Summary

Type of Flooding and Number of Sites:	Fox River	Des Plaines River	Lake Michigan	North Branch Chicago River	Total:
Overbank Flooding	72	28	3	17	120
Local Drainage Problems	52	29	20	11	112
Depressional Flooding	49	29	5	6	89
Septic Problems	0	1	*	*	1
Sewer Back-up	6	1	5	1	13
Associated Erosion	1	1	2		4
Total:	**180**	**89**	**35**	**35**	**339**
Flood Problem Site Locations:					
Floodplain	112	7	7	22	148
(Floodway:)	(8)	(2)	(2)	(14)	(26)
Outside Floodplain	68	28	28	13	137
Critical Facilities Subject to Flooding or Closure:	8	1	4	7	20
Roads and Bridges Threatened by Flooding:	146	67	29	31	273

* Sites reported multiple problems in these categories

An examination of National Flood Insurance Policies and Flood Insurance claims highlights the number of communities that have been impacted by past flooding. Table 3-14 shows Lake County community flood insurance coverage and flood insurance claims since 1978. Note that policies are show for an entire community, including the portions of communities that are in other counties.

More information is available about the Lake County flooding at:
http://www.lakecountyil.gov/Stormwater/FloodInformation/Pages/Default.aspx

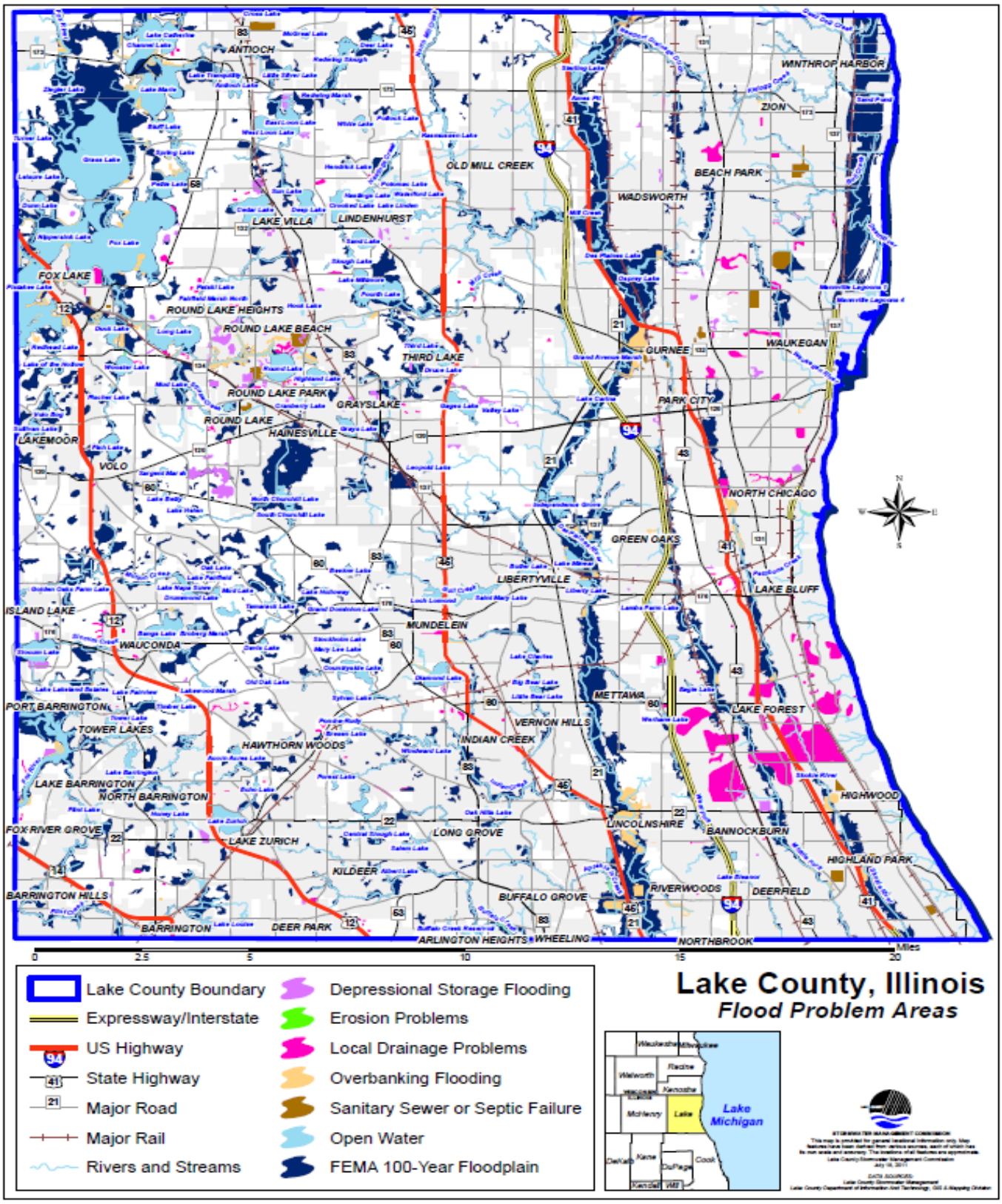


Exhibit 3-3 Lake County "Flood Problem Areas"

Table 3-14 Lake County Flood Insurance Active Policies and Claims, FEMA 2011

Community	Number of Active Policies	Total Premium	Total Coverage	Number of Claims*	Total Paid
Village of Antioch	79	$ 80,203	$16,801,200	66	$ 297,194
Village of Bannockburn	3	$ 1,195	$ 1,050,000	1	$ -
Village of Barrington*	36	$ 18,330	$ 8,713,600	23	$ 112,771
Village of Barrington Hills*	13	$ 13,823	$ 3,680,700	5	$ 39,219
Village of Beach Park	31	$ 31,584	$ 6,158,300	10	$ 67,362
Village of Buffalo Grove*	63	$ 46,324	$15,664,300	16	$ 38,545
Village of Deer Park*	5	$ 4,183	$ 1,725,000	1	$ -
Village of Deerfield*	144	$ 108,783	$39,742,600	163	$ 1,245,151
Village of Fox Lake*	303	$ 323,156	$60,926,500	220	$ 905,266
Village of Fox River Grove*	31	$ 38,051	$ 6,966,100	18	$ 54,272
Village of Grayslake	61	$ 56,852	$13,419,800	5	$ 14,412
Village of Green Oaks	14	$ 16,936	$ 3,317,000	2	$ 3,689
Village of Gurnee	119	$ 188,636	$34,587,300	77	$ 1,860,602
Village of Hainesville	1	$333	$ 280,000	0	$ -
Village of Hawthorn Woods	14	$ 16,433	$ 3,795,000	0	$ -
City of Highland Park	161	$ 167,868	$45,566,100	101	$ 207,112
City of Highwood	0	$ -	$ -	0	$ -
Village of Indian Creek	0	$ -	$ -	0	$ -
Village of Island Lake*	35	$ 24,526	$ 7,955,700	1	$ 743
Village of Kildeer	19	$ 22,694	$ 5,520,000	2	$ -
Village of Lake Barrington	17	$ 12,504	$ 4,568,400	4	$ 20,806
Village of Lake Bluff	10	$ 3,660	$ 2,871,800	0	$ -
City of Lake Forest	68	$ 63,553	$18,716,100	31	$ 85,982
Village of Lake Villa	14	$ 10,270	$ 3,239,600	16	$ 17,563
Village of Lake Zurich	15	$ 6,291	$ 3,980,000	3	$ 3,734
Village of Lakemoor*	31	$ 24,331	$ 4,368,300	5	$ 6,760
Village of Libertyville	149	$ 199,286	$35,587,000	57	$ 396,547
Village of Lincolnshire	113	$ 113,929	$32,609,800	19	$ 218,460
Village of Lindenhurst	10	$ 4,910	$ 2,599,000	7	$ 37,337
Village of Long Grove	39	$ 38,345	$12,166,200	5	$ 13,267
Village of Mettawa	5	$ 5,059	$ 1,530,000	1	$ 8,558
Village of Mundelein	48	$ 49,580	$11,808,700	19	$ 63,579
Village of North Barrington	19	$ 14,713	$ 5,395,900	3	$ -
City of North Chicago	10	$ 4,540	$ 1,641,500	7	$ 22,788
Village of Old Mill Creek	0	$ -	$ -	1	$ 7,433
City of Park City	30	$ 13,835	$ 4,973,300	0	$ -
Village of Port Barrington*	44	$ 47,485	$ 9,757,600	47	$ 199,026
Village of Riverwoods	90	$ 86,894	$28,749,100	19	$ 49,587
Village of Round Lake	15	$ 14,672	$ 2,548,700	13	$ 22,743
Village of Round Lake Beach	218	$ 201,300	$32,868,600	102	$ 366,886
Village of Round Lake Heights	6	$ 9,751	$ 1,323,500	8	$ 63,899
Village of Round Lake Park	17	$ 9,991	$ 4,024,900	3	$ 11,642
Village of Third Lake	4	$ 3,849	$ 1,090,000	0	$ -
Village of Tower Lakes	5	$ 7,507	$ 1,305,000	1	$ -
Village of Vernon Hills	24	$ 10,135	$ 4,360,900	2	$ 245
Village of Volo	1	$ 1,440	$ 500,000	0	$ -
Village of Wadsworth	8	$ 7,412	$ 1,986,400	3	$ 3,699
Village of Wauconda	36	$ 34,052	$ 7,705,600	22	$ 156,816

Table 3-14 Lake County Flood Insurance Active Policies and Claims - continued

Community	Number of Active Policies	Total Premium	Total Coverage	Number of Claims*	Total Paid
City of Waukegan	77	$ 83,218	$17,610,200	30	$ 407,890
Village of Wheeling	813	$ 921,455	$ 172,221,300	135	$ 709,809
Village of Winthrop Harbor	10	$ 4,219	$ 2,596,000	4	$ 21,534
City of Zion	9	$ 10,253	$ 1,851,600	11	$ 36,699
Unincorporated Lake County	964	$ 901,931	$ 197,120,500	405	$ 2,210,926
TOTALS	**4,051**	**$4,080,280**	**$ 909,544,700**	**1694**	**$10,010,554**

* Since 1978

3.3.3 Repetitive Flood Loss Properties

FEMA defines a "repetitive loss structure" as a flood-insured structure that has received two or more flood insurance claim payments of more than 25% of the market value within any 10-year period. Lake County currently has 86 repetitive loss structures on the FEMA list. Of the 86 properties, 18 have been mitigated (acquired, elevated or otherwise protected). The remaining 68 properties are located in 14 municipalities and unincorporated Lake County, as presented in Table 3-15.

Table 3-15 Lake County Repetitive Loss Structures

Community	Number of Repetitive Loss Properties as of 6/30/2004*	Number of Repetitive Loss Properties as of 3/31/2011	Mitigated	Mitigation Status	Remaining Repetitive Losses
Village of Beach Park	0	2	0		2
Village of Fox Lake	10	18	0		18
Village of Gurnee	3	6	3	1- 2009 FMA Pending, 1-HMGP School	3
City of Highland Park	5	6	0		6
City of Lake Forest	4	3	1		2
Village of Libertyville	1	2	1		1
Village of Lincolnshire	1	1	0		1
Village of Lindenhurst	2	2	1	1 - 2011 PDM Pending	1
Village of Riverwoods	1	1	0		1
Village of Round Lake	1	1	0		1
Village of Round Lake Beach	2	5	1	1 - 2009 FMA Pending	4
Village of Round Lake Heights	1	1	1	1 - 2008 PDM	0
Village of Wauconda	1	1	0		1
City of Waukegan	1	1	0		1
Lake County (Unincorporated Areas)	24	36	10	1 - Severe Rep. Loss (SRL)	26
Totals:	**57**	**86**	**18**		**68**

The repetitive flood loss structures located throughout the county, but are more concentrated in the Fox River Watershed. They are nearly all single family residences. Two repetitive loss properties are commercial properties.

The repetitive loss properties were examined by community and watershed and new repetitive flood loss areas were identified for this ANHMP (from those identified in the 2004 Draft Lake County Flood Mitigation Plan). The repetitive loss areas are shown in Exhibit 3-4. Repetitive flood loss areas include 1 or more repetitive loss properties and the neighboring or nearby properties subject to similar flood damage. The repetitive loss areas numbers and names are shown in Table 3-16.

The naming convention used for the repetitive flood loss areas are the [Community Name – Subwatershed (or Lake) Name]. Each repetitive loss area has additional properties within the area. Neighboring or nearby properties with similar flood problems are will included in the area. Table 3-16 includes all 86 properties shown on the FEMA list (18 mitigated properties and 68 not mitigation properties).

Table 3-16 Lake County Repetitive Flood Loss Area Numbers and Names

Rep. Loss Area Number	Rep. Loss Area Name	Number of Rep. Loss Properties in Area
1	Beach Park-Dead River	2
2	Fox Lake - Pistakee Lake	7
3	Fox Lake-Fox Lake	5
4	Fox Lake - Local	3
5	Fox Lake- Duck Lake	4
6	Gurnee - Des Plaines	6
7	Highland Park-Middle Fork	1
8	Highland Park-Skokie River 1	3
9	Highland Park - Skokie River 2	2
10	County - Fish Lake Drain	2
11	County - Lower Fox	4
12	County - Upper Fox	1
13	County - Fox Lake	1
14	County - Petite Lake	1
15	County - Lake Marie	8
16	County - Lake Catherine 1	**1**
17	County - Lake Catherine 2	2
18	County - Slocum Lake Drain	3
19	County - Local 1	2
20	County - Lower Des Plaines 1	3
21	County - Lower Des Plaines 2	1
22	County - Lower Des Plaines 3	1
23	County - Lower Des Plaines 4	2
24	Lake Forest - Skokie River	1
25	Lake Forest - Bluff/Ravine	1
26	Libertyville - Des Plaines River	1
27	Lincolnshire - Des Plaines River	1
28	Lindenhurst - Local 1	1
29	Lindenhurst - Local 2	1
30	Riverwoods - Local	1
31	Round Lake Beach -	1
32	Round Lake Beach -	2
33	Round Lake Beach -	1
34	Round Lake Beach -	1
35	Round Lake Heights -	1
36	County - Squaw Creek	1
37	Wauconda - Slocum Lake	1
38	Waukegan - Dead River	1
39	County - Upper Des Plaines	1
40	County - Pistakee Lake	1
41	Lake Forest - Local	2
42	County - Flint Creek	1

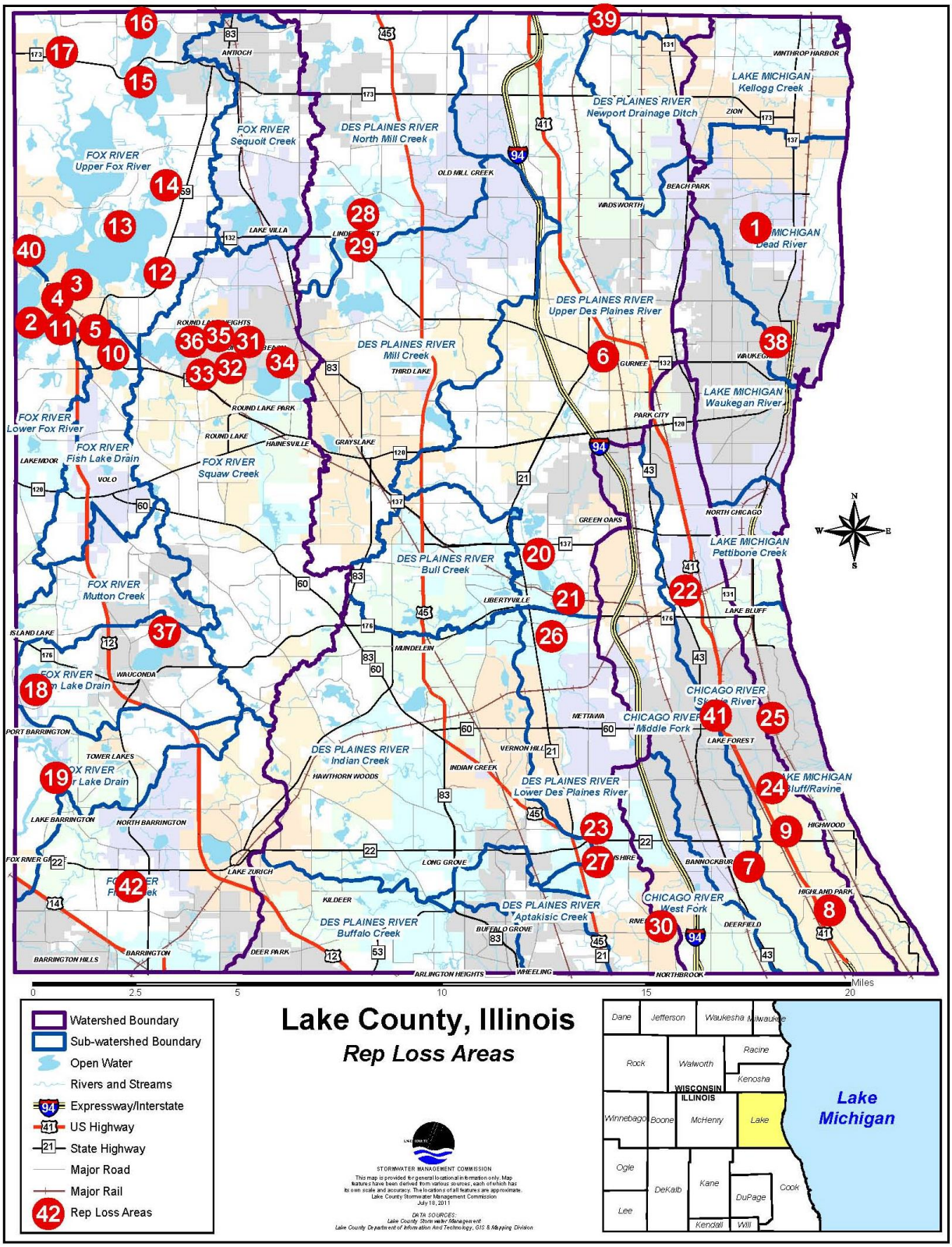


Exhibit 3-4 Lake County Repetitive Flood Loss Areas

Since 2000, Lake County has been conducting "flood audits" in repetitive loss areas. Table 3-17 shows the number of repetitive loss properties that have received a flood audit in each community. A number of the properties included in the 37 properties in Table 3-17 that are shown as "To Be Audited" are within areas that did have other flood audits conducted between 2000 and 2006. Mitigation of repetitive flood loss structures are discussed further in Chapter 5.

Table 3-17 "Flood Audited" Repetitive Loss Properties in Lake County

Community	Audited Repetitive Loss Properties	Repetitive Loss Properties To Be Audited
Village of Beach Park	0	2
Village of Fox Lake	7	11
Village of Gurnee	1	2
City of Highland Park	3	3
City of Lake Forest	2	0
Village of Libertyville	0	1
Village of Lincolnshire	1	0
Village of Lindenhurst	1	0
Village of Riverwoods	1	0
Village of Round Lake	1	0
Village of Round Lake Beach	1	3
Village of Round Lake Heights	--	--
Village of Wauconda	0	1
City of Waukegan	1	0
Lake County (Unincorporated Areas)	12	14
Subtotals:	**31**	**37**
Total Properties = 68		

Risk Assessment- Impact and Vulnerability Analysis (Non-HAZUS)

Local Multi-Hazard Mitigation Planning Guidance from FEMA requires that a LHMP provide a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction. Impact is defined as the consequence or effect of the hazard on the community and its assets. The intent of identifying a jurisdictions overall impact and vulnerability allows a community to analyze these potential impacts and the vulnerabilities that could be reduced through hazard mitigation actions. Below is a portion of the Carroll County LHMP that shows calculations for countywide impact regarding flooding. The analysis utilizes data that is readily available to all jurisdictions including: number of existing structures located within the base floodplain and average market value for residential structure(s) in each municipality. While, there are a number of assumptions that are built into the analysis,

it does provide a local jurisdiction the ability to calculate potential dollar losses to vulnerable structures, without relying on a potentially costly computerized analysis. This estimate ultimately maybe utilized to assist community officials to make decision about protecting their communities.

Carroll County- Plan Approved 7-17-2013

(Impact for Risk Assessment-Flooding)

What are the potential dollar losses to vulnerable structures from flooding?

An estimate of the potential dollar losses to vulnerable *residential structures* located within the *participating municipalities* can be calculated if several assumptions are made. These assumptions represent a probable scenario based on the reported occurrences of flooding in Carroll County.

The purpose of providing an estimate is to help residents and municipal officials make informed decisions about how they can better protect themselves and their communities. These estimates are meant to provide a ***general idea*** of the magnitude of the potential damage that could occur from a flood event in each of the municipalities.

To calculate the overall potential dollar losses to vulnerable residential structures from a flood, a set of decisions/assumptions must be made regarding the:

- type of flood event;
- scope of the flood event;
- number of potentially-damaged housing units;
- value of the potentially-damaged housing units; and
- percent damage sustained by the potentially-damaged housing units (i.e., damage scenario.)

The following provides a detailed discussion of each decision/assumption.

Type of Flood Event

The first step towards calculating the potential dollar losses to vulnerable residential structures is to determine the type of flood event that will be used for this scenario. While flash flooding events have caused the greatest amount of recorded flood damages in the County, identifying residential structures vulnerable to flash flooding is problematic because most are located outside of the base floodplain. In addition, the number of structures impacted can change with each event depending on the amount of precipitation received, the topography and the land use of the area.

Assumption #1

A riverine flood event will impact vulnerable residential structures within each municipality.

Therefore, a riverine flood event will be used since it is relatively easy to identify vulnerable residential structures (i.e., those structures located within the base floodplain or Special Flood Hazard Areas) within each municipality using the DFIRMs and the number of structures impacted is generally the same from event to event.

Scope of the Flood Event

To establish the number of vulnerable residential structures or potentially-damaged housing units, the scope of the riverine flood event within each municipality must first be determined. In this scenario, the scope refers to the number of rivers and creeks that overflow their banks and the degree of flooding experienced along base floodplains for each river and creek.

Assumption #2

All base floodplains within a municipality will flood and experience the same degree of

Generally speaking, a riverine flood event only affects one or two rivers or streams at a time depending on the cause of the event (i.e., precipitation, snow melt, ice jam, etc.) and usually does not produce the same degree of flooding along the entire length of the river or creek. However, for this scenario, it was decided that:

- all rivers and creeks with base floodplains would overflow their banks, and
- the base floodplains of each river and/or creek located within the corporate limits of each municipality would experience the same degree of flooding.

This assumption results in the following conditions for each municipality:

- Chadwick, Lanark, Shannon and Thomson would not experience any flooding since there are no rivers or creeks with base floodplains within their municipal limits;
- Elkhorn Creek would overflow its banks and flood the eastern portion of Milledgeville;
- Carroll Creek (Wakarusa River) and an Unnamed Intermittent Tributary of Carroll Creek would overflow their banks and flood portions of Mount Carroll; and
- Plum River and the Mississippi River would overflow their banks and flood portions of Savanna.

Number of Potentially-Damaged Housing Units

Since this scenario assumes that a riverine flood will impact all base floodplains within a municipality, the number of potentially-damaged housing units can be determined by counting the number of existing residential structures located within the base floodplain(s) in each municipality. These counts were prepared by the Carroll County Zoning Administrator and the GIS Department.

Assumption #3

The number of existing residential structures located within the base floodplain in each municipality will be used to determine the number of potentially-damaged housing units.

The following municipalities have existing residential buildings located within the base floodplains of their communities:

- Mount Carroll has 13 residential buildings and two apartment buildings, and
- Savanna has 34 residential buildings.

Value of Potentially-Damaged Housing Units

Now that the number of potentially-damaged housing units has been determined, the monetary value of each unit must be calculated. Typically when damage estimates are prepared after a natural disaster such as a flood, they are based on the market value of the structure. Since it would be impractical to determine the individual market value of each potentially-damaged housing unit, the average market value for a residential structure in each municipality will be used to calculate the potential dollar losses.

Assumption #4

The average market value for a residential structure in each municipality will be used to determine the value of potentially-damaged housing units.

To determine the average market value, the average assessed value must first be calculated. The average assessed value is determined by taking the total assessed value of non farm buildings within a municipality and dividing that number by the total number of housing units in the municipality. **Figure 42** provides a sample calculation. The total assessed value is based on 2011 tax assessment information provided by the Carroll County Chief County Assessment Office.

Figure 42
Calculation of Average Assessed Value

Total Assessed Value of Non Farm Buildings ÷ Total Housing Units = Average Assessed Value
(Rounded to the Nearest Penny)

Chadwick: $6,007,131 ÷ 227 housing units = $26,463.13

To determine the average market value, the average assessed value is multiplied by three (the assessed value of a structure in Carroll County is approximately one-third of the market value). **Figure 43** provides the average assessed value and average market value for each participating municipality.

Figure 43
Average Market Value of Housing Units

Participating Jurisdiction	Total Assessed Value of Non Farm Buildings (2011)	Total Housing Units (2000)	Average Assessed Value	Average Market Value
Chadwick	$6,007,131	227	$26,463.13	$79,389
Lanark	$16,126,584	694	$23,237.15	$69,711
Milledgeville	$13,460,077	499	$26.974.10	$80,922
Mount Carroll	$16,982,569	854	$19,885.91	$59,658
Savanna	$26,639,043	1,796	$14,832.43	$44,497
Shannon	$11,081,880	361	$30,697.73	$92,093
Thomson	$5,868,781	239	$24,555.57	$73,667

Source: Eberle, Leah, Carroll County Chief County Assessment Office.

Damage Scenario

The final decision that must be made to calculate potential dollar losses is to decide on the percent damage sustained by the structure and the structure's contents during the flood event. In order to determine the percent damage using FEMA's flood loss estimation tables, assumptions must be made regarding a) the type of residential structure flooded (i.e., manufactured home, one story home without a basement, one or two story home with a basement, etc.) and b) the flood depth. For this scenario, it is assumed that the potentially-damaged housing units are one or two story homes with basements and the flood depth is two feet. With these assumptions the expected percent damage sustained by the ***structure*** is estimated to be 20% and the expected percent damage sustained by the structure's ***contents*** is estimated to be 30%.

Assumption #5

The potentially-damaged housing units are one or two story homes with basements and the flood depth is two feet.

Structural Damage = 20%
Content Damage = 30%

Potential Dollar Losses

Now that all of the decisions/assumptions have been made, the potential dollar losses can be calculated. First the potential dollar losses to the ***structure*** of the potentially-damaged housing units must be determined. This is done by taking the average market value for a residential structure and multiplying that by the percent damage (20%) to get the average structural damage per unit. Next the average structural damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 44** provides a sample calculation.

Figure 44
***Structure* – Potential Dollar Loss Calculations**

Average Market Value per Housing Unit x Percent Damage = Average Structural Damage

Mount Carroll: $59,658 x 20% = $11,931.60 per Unit

Average Structural Damage x Number of Potentially-Damaged Housing Units =
Potential Dollar Losses – Structure
(Rounded to the Nearest Dollar)

Mount Carroll: $11,931.60 x 13 housing units = $155,111

Next the potential dollar losses to the ***content*** of the potentially-damaged housing units must be determined. Based on FEMA guidance, the value of a residential housing unit's content is approximately 50% of its market value. Therefore, start by taking one-half the average market value for a residential structure and multiply that by the

percent damage (30%) to get the average content damage per unit. Next the average content damage per unit is multiplied by the number of potentially-damaged housing units. **Figure 45** provides a sample calculation.

Figure 45
***Content* – Potential Dollar Loss Calculations**

½ (Average Market Value Per Housing Unit) x Percent Damage = Average Content Damage

Mount Carroll: ½ ($59,658) x 30% = $8,948.70 per Unit

Average Content Damage x Number of Potentially-Damaged Housing Units =
Potential Dollar Losses – Content
(Rounded to the Nearest Dollar)

Mount Carroll: $8,948.70 x 13 housing units = $166,333

Finally the ***total potential dollar losses*** may be calculated by adding together the potential dollar losses to the structure and the content. **Figure 46** gives a breakdown of the total potential dollar losses by municipality.

This assessment illustrates why potential residential dollar losses should be considered when municipalities are deciding which mitigation projects to pursue. Potential dollar losses caused by riverine flooding to vulnerable residences within the participating municipalities would be expected to range from $270,000 to $530,000. There are five participating municipalities in this scenario who do not have any residences considered vulnerable to riverine flooding.

Figure 46
Estimated Potential Dollar Losses to Potentially-Damaged Housing Units from a Riverine Flood Event

Participating Jurisdiction	Average Market Value	Potentially Damage Housing Units	Potential Dollar Losses		Total Potential Dollar Losses
			Housing Unit	Content	
Chadwick	$79,389	0	$ 0	$ 0	$ 0
Lanark	$69,711	0	$ 0	$ 0	$ 0
Milledgeville	$80,922	0	$ 0	$ 0	$ 0
Mount Carroll	$59,658	13	$155,111	$116,333	$271,444
Savanna	$44,497	34	$302,580	$226,935	$529,515
Shannon	$92,093	0	$ 0	$ 0	$ 0
Thomson	$73,667	0	$ 0	$ 0	$ 0

The calculations presented above are meant to provide the reader with a sense of the scope or magnitude of a large riverine flood event in dollars. These calculations do not include the physical damages sustained by businesses or other infrastructure. Monetary impacts to businesses can include loss of sales revenue either through the temporary closure or loss of crucial services (i.e., power, drinking water and sewer). The damage sustained by infrastructure from a flood event can far surpass the damage experienced by residential structures. As a result, the cumulative monetary impacts to businesses and infrastructure can exceed the cumulative monetary impacts to residences. While average dollar amounts can not be supplied for these items at this time, they should be taken into account when discussing the overall impacts that a large-scale riverine flood event could have on the participating jurisdictions.

Risk Assessment- Impact and Vulnerability Analysis (HAZUS)

As discussed in the previous example; the Local Multi-Hazard Mitigation Planning Guidance from FEMA requires that a LHMP provide a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction. This analysis can be completed utilizing a variety of different methods. FEMA has developed HAZUS (HAZUS-MH), which is defined as a nationally standardized geographic information system (GIS) that can be used to assess vulnerability by estimating losses from floods, earthquakes and hurricane wind events. This system was developed in an effort to assist communities in hazard vulnerability analysis from a scientific basis. It is important to note that HAZUS is not required in LHMPs, but the system does provide another useful tool for jurisdictions to analyze the potential impact and vulnerability to identified hazards. Below is a portion of the Jackson County LHMP that utilizes HAZUS-MH to identify the countywide impact and vulnerability for an earthquake hazard. The analysis utilizes specific GIS data regarding structure location within the county to provide a scientific analysis of the potential impact. This estimate ultimately may be utilized to assist community officials to make informed decision about protecting their communities.

Jackson County- Plan Approved September 25th, 2009

(Loss Estimates- Earthquake)

The SIU-Polis team reviewed existing geological information and recommendations for earthquake scenarios. Three earthquake scenarios—two based on USGS modeled scenarios and one based on deterministic scenarios were developed to provide a reasonable basis for earthquake planning in Jackson County. The two USGS analyses were a M7.7 event on the New Madrid fault zone and M7.1 earthquake on the Wabash Valley Seismic Zone. Shake maps provided by FEMA were used in HAZUS-MH to estimate losses for Jackson County based on these events. The final scenario was a Moment Magnitude of 5.5 with the epicenter located in Jackson County. Note that a deterministic scenario, in this context, refers to hazard or risk models based on specific scenarios without explicit consideration of the probability of their occurrences. This scenario was selected based upon a rupture on the Ste. Genevieve Fault Zone, a local fault that presents a realistic earthquake scenario for planning purposes.

Modeling a deterministic scenario requires user input for a variety of parameters. One of the most critical sources of information that is required for accurate assessment of earthquake risk is soils data. FEMA provided a NEHRP (National Earthquake Hazards Reduction Program) soil classification map for Illinois. NEHRP soil classifications portray the degree of shear-wave amplification that can occur during ground shaking.

FEMA provided a liquefaction map for Illinois. Low-lying areas in floodplains with a water table within five feet of the surface are particularly susceptible to liquefaction. These areas contain Class F soil types. For this analysis, a depth to water table of five meters was used.

Results for 7.7 Magnitude New Madrid Earthquake Scenario

The results of the 7.7 New Madrid Earthquake are depicted in Table 4-26, Table 4-27, and Figure 4-13. HAZUS-MH estimates that approximately 143 buildings will be at least moderately damaged. This is more than 1% of the total number of buildings in the region.

The total building related losses totaled $97.14 million; 1% of the estimated losses were related to the business interruption of the region. Large losses were sustained by the residential occupancies, which comprised more than 26% of the total loss.

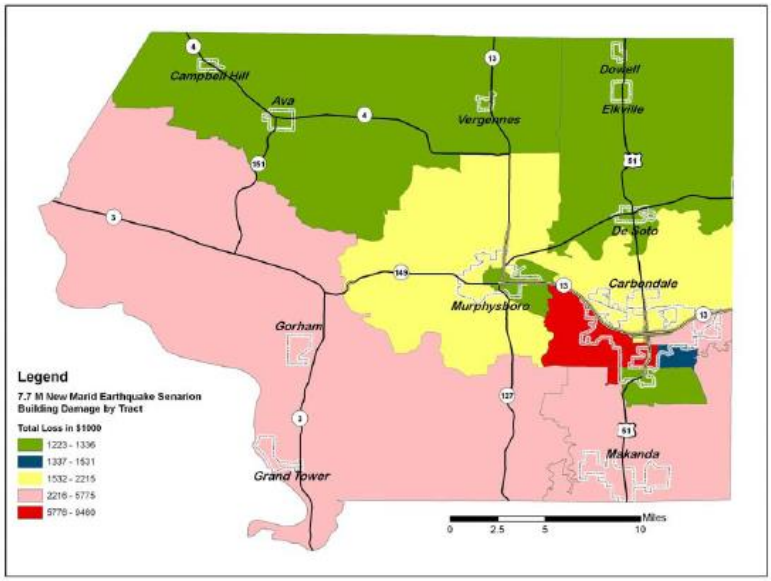
Table 4-26: New Madrid Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,360	8.48	168	8.76	13	9.57	0	9.81	0	0.00
Commercial	1,086	6.77	111	5.76	3	2.44	0	0.58	0	0.00
Education	240	1.50	52	2.72	11	7.47	0	10.81	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	99	0.62	10	0.52	0	0.19	0	0.00	0	0.00
Other Residential	224	1.40	24	1.27	1	0.83	0	0.48	0	0.00
Religion	4	0.03	1	0.03	0	0.05	0	0.06	0	0.00
Single Family	13,017	81.20	1,554	80.94	112	79.46	2	78.26	0	0.00
Total	**16,031**		**1,920**		**141**		**3**		**0**	

Table 4-27: New Madrid Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.01	0.00	0.63	0.64
	Capital-Related	0.00	0.00	0.02	0.00	0.27	0.29
	Rental	0.13	0.00	0.03	0.00	0.24	0.41
	Relocation	0.01	0.00	0.00	0.00	0.07	0.08
	Subtotal	**0.14**	**0.00**	**0.05**	**0.00**	**1.21**	**1.41**
Capital Stock Loses							
	Structural	0.83	0.03	0.25	0.06	1.24	2.41
	Non_Structural	12.90	1.78	5.68	3.14	21.13	44.63
	Content	8.70	0.83	2.78	0.90	35.17	48.38
	Inventory	0.00	0.00	0.01	0.00	0.29	0.30
	Subtotal	**22.43**	**2.64**	**8.72**	**4.11**	**57.83**	**95.73**
	Total	**22.57**	**2.64**	**8.77**	**4.11**	**59.04**	**97.14**

Figure 4-13: New Madrid Valley Scenario-Building Economic Losses in Thousands of Dollars



New Madrid Scenario—Essential Facility Losses

Before the earthquake, the region had 836 care beds available for use. On the day of the earthquake, the model estimates that only 50 care beds (6.0%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 65% of the beds will be back in service. By day 30, 89% will be operational.

Results for 7.1 Magnitude Wabash Valley Earthquake Scenario

The results of the 7.1 Wabash Valley Earthquake are depicted in Table 4-28, Table 4-29, and Figure 4-14. HAZUS-MH estimates that approximately 119 building will be at least moderately damaged.

The total building related losses totaled $92.38 million; 1 % of the estimated losses were related to the business interruption of the region. Large losses were sustained by the residential occupancies, which comprised more than 27% of the total loss.

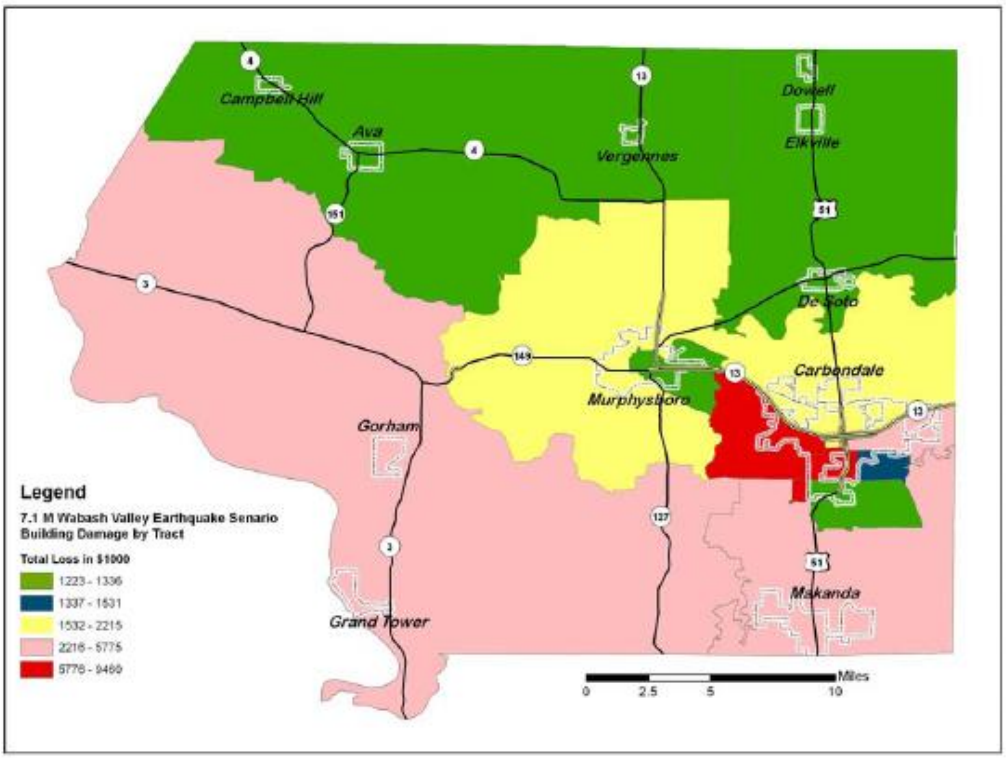
Table 4-28: Wabash Valley Scenario-Damage Counts by Building Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	1,368	8.49	163	8.75	11	9.61	0	10.29	0	0.00
Commercial	1,086	6.74	110	5.92	3	2.79	0	0.39	0	0.00
Education	257	1.60	39	2.12	6	5.10	0	6.23	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	99	0.61	10	0.53	0	0.23	0	0.00	0	0.00
Other Residential	225	1.40	24	1.28	1	0.85	0	0.46	0	0.00
Religion	4	0.03	1	0.03	0	0.05	0	0.06	0	0.00
Single Family	13,073	81.13	1,514	81.36	96	81.37	2	82.58	0	0.00
Total	**16,113**		**1,862**		**117**		**2**		**0**	

Table 4-29: Wabash Valley Scenario-Building Economic losses in Millions of Dollars

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Loses							
	Wage	0.00	0.00	0.00	0.00	0.43	0.44
	Capital-Related	0.00	0.00	0.01	0.00	0.19	0.19
	Rental	0.12	0.00	0.02	0.00	0.15	0.28
	Relocation	0.01	0.00	0.00	0.00	0.04	0.05
	Subtotal	**0.13**	**0.00**	**0.02**	**0.00**	**0.81**	**0.96**
Capital Stock Loses							
	Structural	0.78	0.03	0.22	0.06	0.85	1.94
	Non_Structural	12.77	1.78	5.64	3.14	19.08	42.42
	Content	8.65	0.83	2.76	0.90	33.61	46.76
	Inventory	0.00	0.00	0.01	0.00	0.29	0.30
	Subtotal	**22.20**	**2.64**	**8.63**	**4.11**	**53.84**	**91.42**
	Total	**22.33**	**2.64**	**8.65**	**4.11**	**54.65**	**92.38**

Figure 4-14: Wabash Valley Scenario-Building Economic Losses in Thousands of Dollars



Wabash Valley Scenario—Essential Facility Losses

Before the earthquake, the region had 836 care beds available for use. On the day of the earthquake, the model estimates that only 50 care beds (6.0%) are available for use by patients already in medical care facilities and those injured by the earthquake. After one week, 65% of the beds will be back in service. By day 30, 89% will be operational.

Risk Assessment- Land Use and Development Trends

Requirement 201.6(c)(2)(ii) identifies that a LHMP, should describe land uses and development trends within the community so that mitigation options can be considered in future land use decisions. This type of analysis may take into consideration current land use, development density, and any anticipated development. This analysis provides a basis for making decisions on the type of mitigation approach to consider, and the locations where these approaches could be implemented. It is also important to identify areas of hazard areas to ensure future development would not be impacted in these areas. The Kendall County LHMP provides a detailed analysis of land use and development trends. The Kendall County LHMP identifies current land use as well as providing land use maps for each of the jurisdictions involved in the planning process.

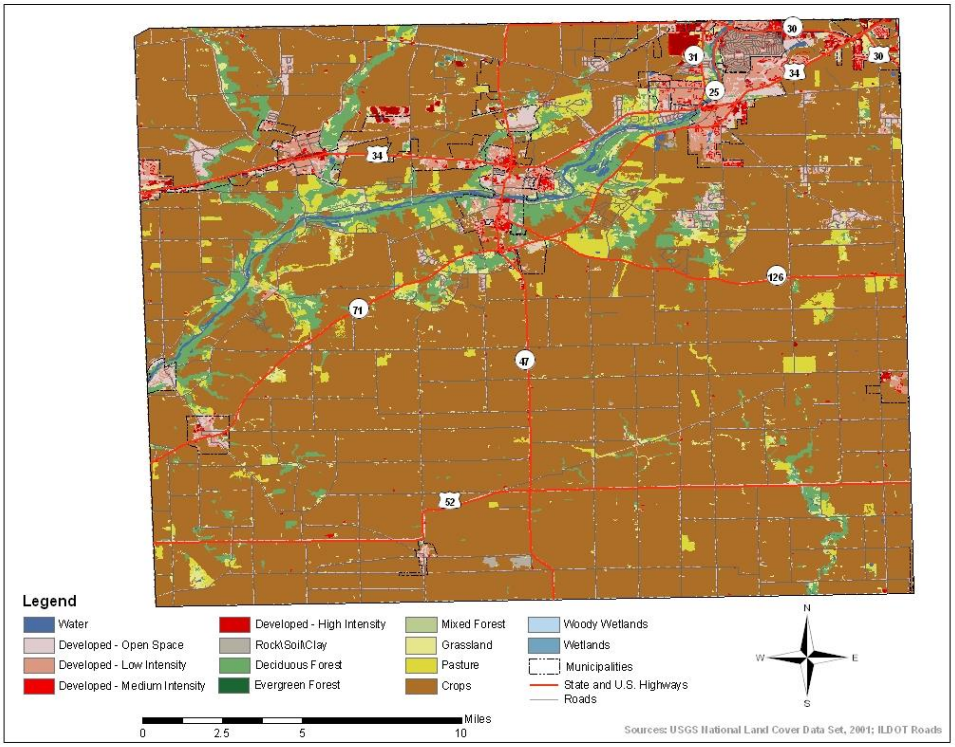
Kendall County- Plan Approved May 22nd, 2012

(Land Use and Development Trends)

3.6 Land Use and Development Trends

Agriculture is the predominant land use in Kendall County with approximately 80% of the land used as pasture or for growing crops. Other significant land uses include manufacturing, commercial, residential, and tourism. Kendall County is home to several spacious parks for fishing, camping, hiking, and water sports. The parks include Yorkville Prairie Nature Preserve, Maramech Woods Nature Preserve, Houses Grove Forest Preserve, Saw Wee Kee Park, and Silver Springs State Park. Figure 3-4 shows the land cover throughout Kendall County.

Figure 3-4: Kendall County Land Cover



Kendall County is one of the fasting developing counties in the United States. The County and nearly all of incorporated communities (Oswego, Plano, Minooka, Montgomery, Plainfield, Sandwich, and Yorkville) have either a comprehensive or a future land use plan (see Table 1-4). The purpose of these plans is to provide guidance for future development. Each plan calls for no development in floodplains and carefully considers placement of residential space in relation to industrial and commercial land uses. Figures 3-5 through 3-12 shows the planned land use in each these jurisdictions.

Figure 3-5: Future Land Use Map for Kendall County

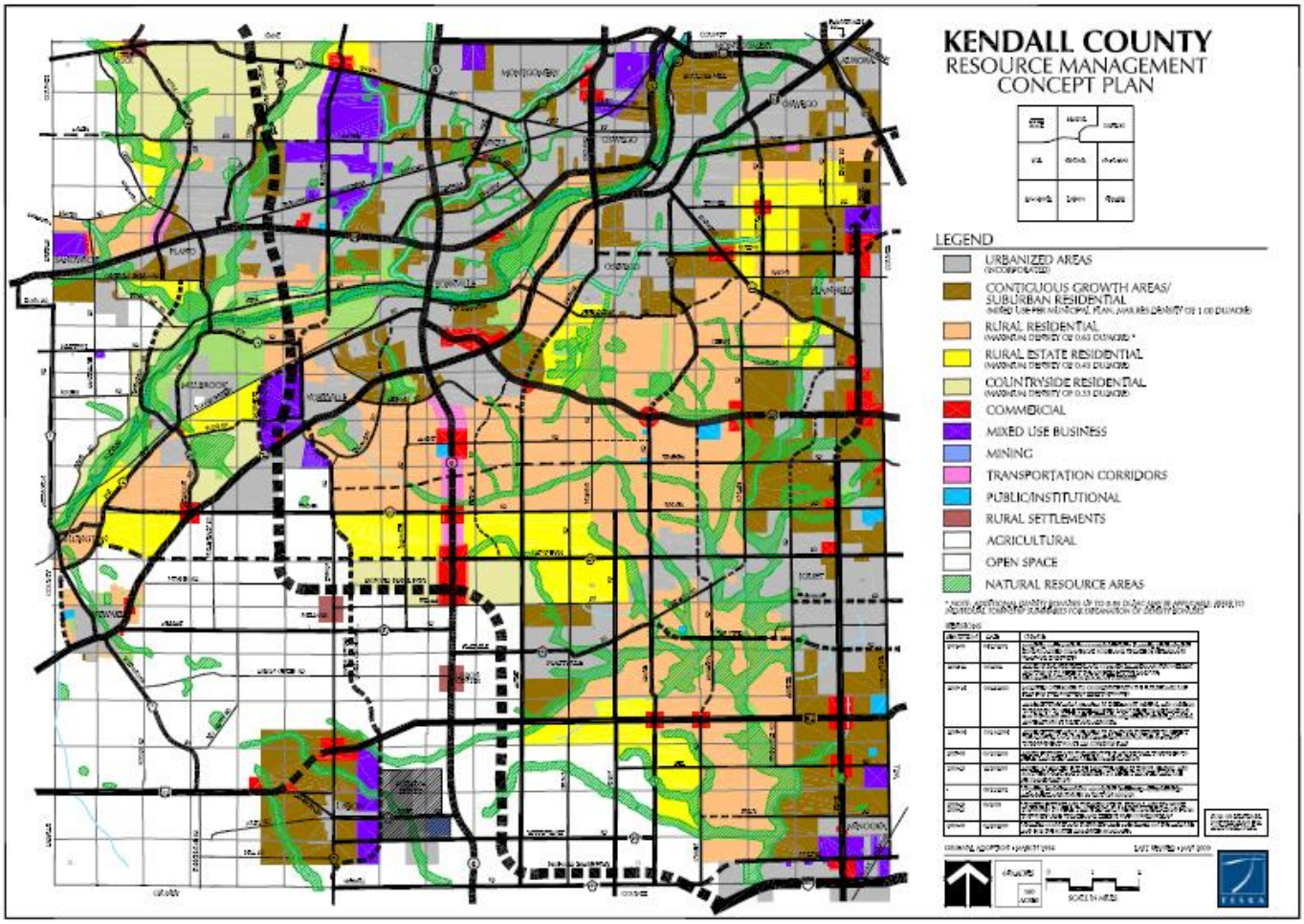
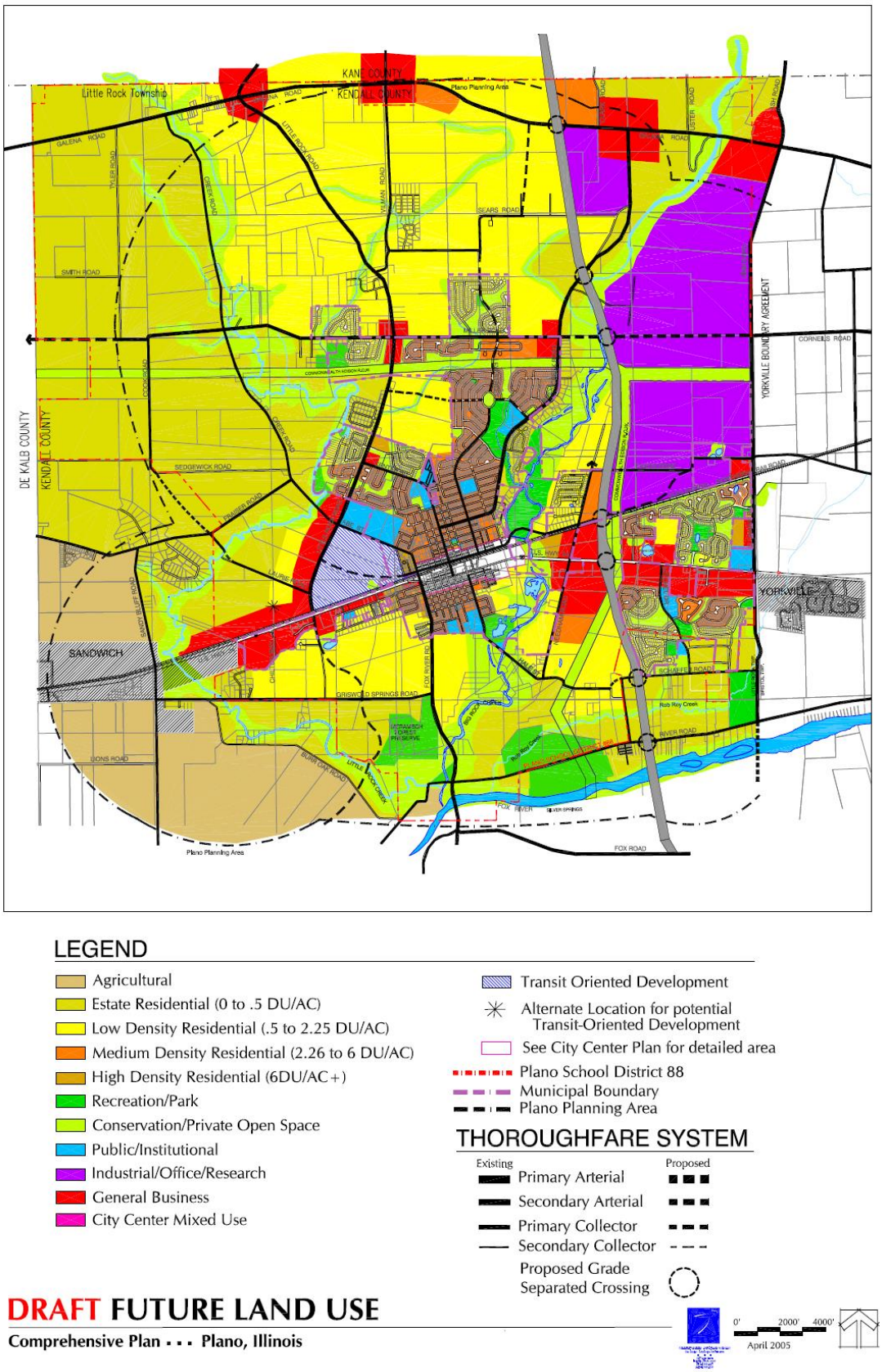


Figure 3-6: Future Land Use Map for City of Plano



LEGEND

- Agricultural
- Estate Residential (0 to .5 DU/AC)
- Low Density Residential (.5 to 2.25 DU/AC)
- Medium Density Residential (2.26 to 6 DU/AC)
- High Density Residential (6DU/AC+)
- Recreation/Park
- Conservation/Private Open Space
- Public/Institutional
- Industrial/Office/Research
- General Business
- City Center Mixed Use
- Transit Oriented Development
- Alternate Location for potential Transit-Oriented Development
- See City Center Plan for detailed area
- Plano School District 88
- Municipal Boundary
- Plano Planning Area

THOROUGHFARE SYSTEM

Existing		Proposed
▬	Primary Arterial	■ ■ ■
▬	Secondary Arterial	■ ■ ■
▬	Primary Collector	■ ■ ■
—	Secondary Collector	- - -
	Proposed Grade Separated Crossing	○

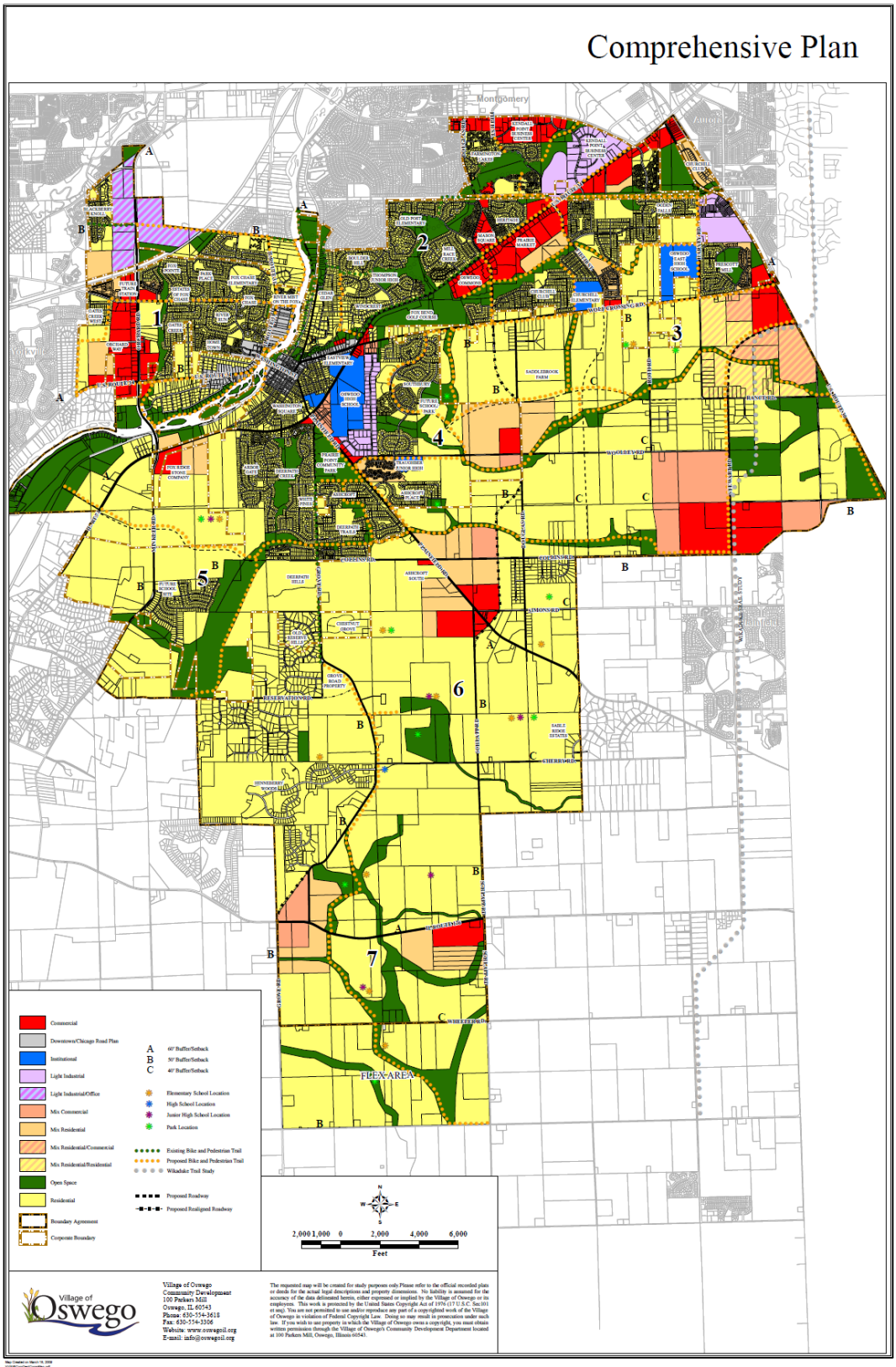
DRAFT FUTURE LAND USE

Comprehensive Plan • • • Plano, Illinois

0' 2000' 4000'

April 2005

Figure 3-11: Future Land Use Map for Village of Oswego



III. Local Hazard Mitigation Strategy

As indicated in the Stafford Act Section 322(b), Local Hazard Mitigation Plans shall describe hazard mitigation actions and establish a strategy to implement those actions. It is this mitigation strategy that serves as the long-term blueprint for reducing the potential losses identified in the plans risk assessment. The Hazard Mitigation Strategy Sections for each LHMP will be reviewed upon submission to ensure that the section identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard. Goals will be reviewed to determine if they reflect the State's mitigation goals. Objectives and projects/actions will be reviewed only to the extent necessary to determine if their implementation will achieve their goals. The Local Mitigation Projects form will be provided when the planning process begins by the SHMO and will be required by IEMA when the local mitigation plan is submitted for FEMA approval.

The information listed above that is required from the local mitigation plans will be incorporated into a work copy of the State Natural Hazard Mitigation Plan as plans receive approval. This will be an on-going process so the information will be readily available for plan updating.

As highlighted in Chapter IV Section C. Local Government Mitigation Capability Assessment of the IHHMP a Project Tracking Database was created to capture the mitigation actions identified in LHMPs. With this tool, in the future IEMA will be able to gauge their program development and their capability to implement their mitigation goals. The database enables correlation between LHMP and the INHMP as, we will be able to see which actions are most popular and most cost effective to implement. In each identifiable action inside the database we can see funding sources, lead implementer, and jurisdiction specific information. This database will also be utilized by the State's Mitigation Section, to track approved local mitigation projects funded by Hazard Mitigation Grant Funds. This will assist the State in tracking and document the types of mitigation projects being completed throughout the State. In addition, the Mitigation Section will utilize this database to correlate mitigation actions being submitted when updated plans are received. This approach will provide for a well-rounded examination of mitigation projects being completed within the state and those requiring assistance to complete.

The images below provide screen shots of the database we use to track mitigation actions that have been identified in the approved plans.

Microsoft Access - [Buyout : Select Query]

File Edit View Insert Format Records Tools Window Help Adobe PDF

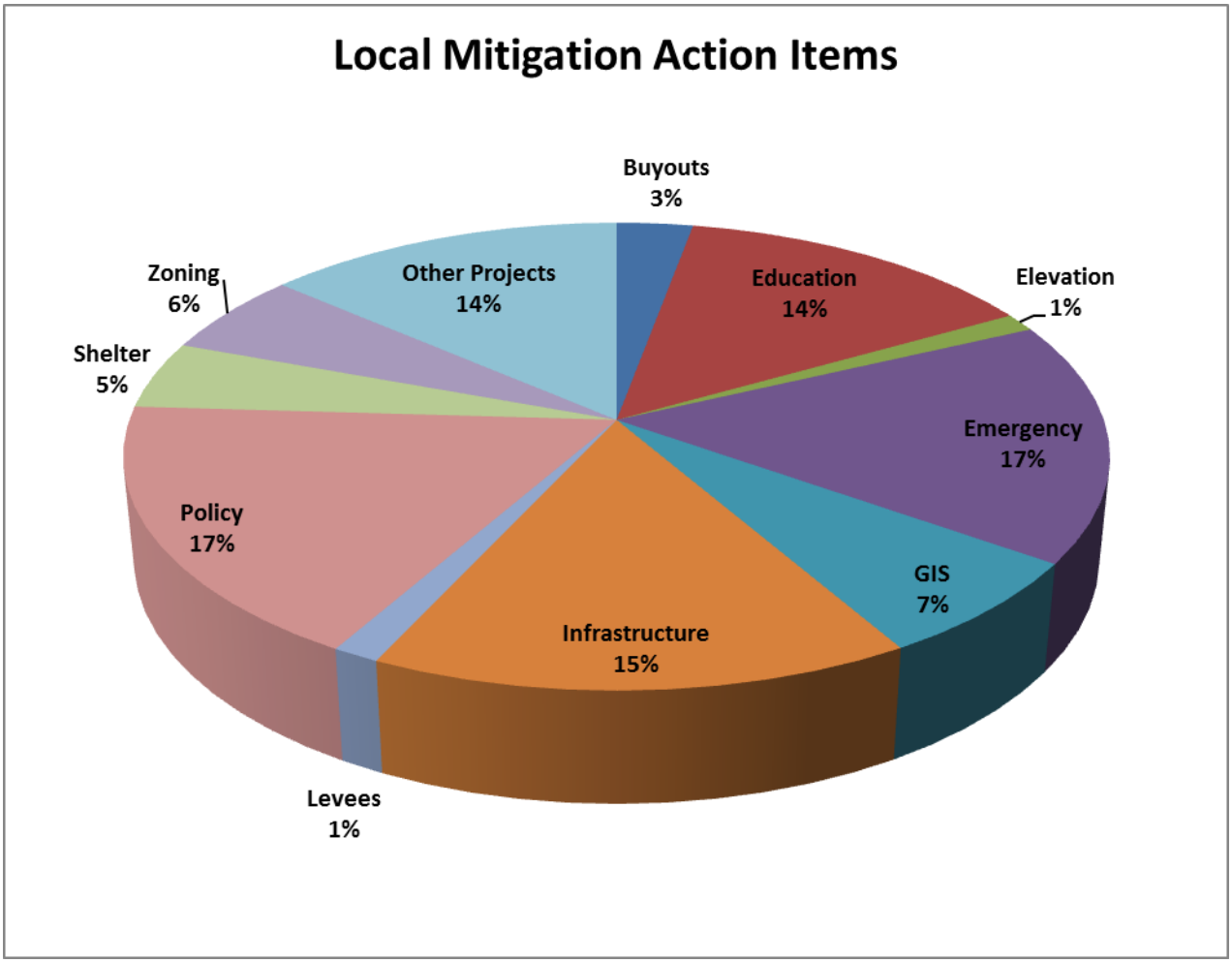
ID	Project Nam	Description	Goal	Jurisdiction	Completion Stat	Buyouts	EstCost	County
450	Flood	Acquire properties located within the Boneyar	2	City of Champa	Not Started	☑		Champaign
449	Flood	Continue to implement plans for the East Univ	1	City of Champa	Not Started	☑		Champaign
562	Flood	When appropriate, acquire flood-prone prope	19	City of Urbana	Not Started	☑		Champaign
448	Flood	Review hazard mitigation options regarding re	3	Village of Broad	Not Started	☑		Champaign
493	Flood	Acquire flood-prone properties along Sangam	13	Village of Mahor	Not Started	☑		Champaign
357	Flood	As repetitive flood loss areas are identified ar	7	DeKalb Cty	Not Started	☑		DeKalb
318	Flood	Properties exposed to flood damage in DuPag	1, 2 4, 6	DuPage County	Not Started	☑		DuPage
376	Flood	Coordinate relocation/acquisition programs w	6	Lake Cty	Not Started	☑		Lake
375	Flood	Inventory and prioritize buildings located in flo	5	Lake Cty	Not Started	☑		Lake
595	Flood	Identify and assess repetitive loss areas in yo	2	City of LaSalle	Not Started	☑	1000	LaSalle
609	Flood	Create open space in the floodplains to reduc	19	City of LaSalle	Not Started	☑	500000	LaSalle
631	Flood	Identify and assess repetitive loss areas in yo	2	City of Ottawa	Not Started	☑		LaSalle
651	Flood	Identify and assess repetitive loss areas in yo	2	Village of Henne	Not Started	☑		Putnam
73	Flood/Prope	Consider voluntary flood acquisition programs			Not Started	☑		Rock Island
74	Flood/Prope	Pursue voluntary acquisition program for Bar		RI County	Not Started	☑		Rock Island
245	Flood	Acquire repetitively damaged flood prone proj		Sangamon Cty	Not Started	☑		Sangamon
278	Flood	Acquire repetitively flood-damaged properties		Springfield	Not Started	☑		Sangamon
115	Flooding	Acquire property located within the NFIP desi	1, 2	Machesney PK	Not Started	☑		Winnebago
139	Flooding	Floodproof, Relocate, Elevate and Demolish a	1, 2	Rockford	Not Started	☑		Winnebago
202	Flooding	Floodproof homes in the floodplains.	1, 2, 3	Winnebago Cty	Not Started	☑		Winnebago

ID 357
Jurisdiction DeKalb Cty **County** DeKalb
First Name Dennis **Last Name** Miller
Description As repetitive flood loss areas are identified and investigated, and as cost-effective mitigation alternatives are developed (acquisition, elevation or floodproofing), funding assistance from FEMA or IEMA should be pursued.

ID 318
Jurisdiction DuPage County **County** DuPage
First Name Norm **Last Name** Sturm
Description Properties exposed to flood damage in DuPage Co. should be protected through property protection measures where regional structural projects are not feasible. Property protection measure should include elevation or floodproofing.

ID 376
Jurisdiction Lake Cty **County** Lake
First Name Kent **Last Name** McKenzie
Description Coordinate relocation/acquisition programs with other local and county-wide land acquisition programs including FPD, CDBG program, park districts and public works.

This database is broken down into 11 broad based mitigation action items categories including: Buyout, Education, Elevation, Emergency, GIS, Infrastructure, Levee, Policy, Shelter, Zoning and Other Projects. As the number of approved local hazard mitigation plan increase so do the capabilities of these jurisdictions. Planning is imperative to properly identify and analyze the specific risks that impact a jurisdiction. This in-depth assessment makes a clear connection between the jurisdiction's vulnerability and the hazard mitigation actions. These local hazard mitigation plans provide the avenue to describe specific hazard mitigation actions and establish a strategy to implement those actions including prioritization, responsible agencies and possible funding avenues. This breakdown also allows the State to identify and maintain consistency regarding the prioritization of mitigation projects approved for funding within the State. The following graph depicts a breakdown in percentage of the mitigation priorities of actions items indicated in approved local hazard mitigation plans.



As identified in the Local Multi-Hazard Mitigation Planning Guidance, a critical step in the development of specific hazard mitigation actions and projects is assessing the community's existing authorities, policies, programs and resources. Fiscal constraints are increasingly becoming an issue in the implementation of many mitigation projects, placing an increasing emphasis on different mechanisms such as: involving staff in additional local planning activities explore funding through taxing authorities or annual budgets and establishing/maintaining regulatory authorities for comprehensive planning, building codes, and ordinances. Multi-jurisdictional hazard mitigation plans, must provide identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

Illinois' LHMPs provide a wide variety of mitigation action items in their mitigation strategy. Overall many of mitigation strategies were developed in an overarching approach, which results in an uncertainty of prioritization of the actions identified. Without specific action prioritization, it is difficult to document funding sources, responsible staff/agency to coordinate the project and identify projects with the highest mitigation benefit. As seen in the Local Mitigation Action Items Graph, the leading mitigation action group is emergency. Unfortunately, the mitigation actions identified in this group are typically non-mitigation activities related to response activities. The remaining top three groups include: policy, infrastructure and education.

Mitigation Strategy Example:

As stated in the Local Multi-Hazard Mitigation Planning Guidance, the mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. For multi-jurisdictional plans, each participating jurisdiction identifies the specific actions they will undertake for each hazard profiled. Some actions may apply to more than one jurisdiction, but specific mitigation actions are identified for each jurisdiction as their risk to specific hazards differs. The Jo Daviess County LHMP provides a good example of identifying specific mitigation actions for each participating jurisdictions within the plan. The plan identified specific mitigation actions for both the countywide and for each of the jurisdictions participating in the planning process. Below are potions of the mitigation strategy section explaining how the strategy was developed and examples of action items from the county and three participating jurisdictions.

Jo Daviess County- Meet Requirement 06-03-2013

(Mitigation Strategy)

4.0 MITIGATION STRATEGY

This section focuses on determining how to reduce or eliminate the potential loss of life and property damage that results from the natural hazards identified in the Risk Assessment section of this Plan. In order to accomplish this objective, the Planning Committee developed a mitigation strategy that included the following steps:

- formulating mitigation goals to reduce or eliminate long-term vulnerabilities to natural hazards;
- identifying, analyzing and prioritizing a comprehensive range of specific mitigation actions including those related to continued compliance with the National Flood Insurance Program; and
- describing how each jurisdiction will implement the mitigation actions identified.

Provided below is a detailed discussion of each mitigation strategy step.

4.1 HAZARD MITIGATION GOALS

The first step outlined in the mitigation strategy is to develop mitigation goals that aim to reduce or eliminate long-term vulnerabilities to the natural hazards identified. The mitigation goals are general guidelines that explain what the participants want to achieve in terms of hazard and loss prevention.

A preliminary list of eight hazard mitigation goals was developed and distributed to the Planning Committee members at the first meeting on March 30, 2012. Members were asked to review the list before the second meeting and consider whether any changes needed to be made or if additional goals should be included. At the Planning Committee's June 14, 2012 meeting, the group discussed the preliminary list of goals and approved them with no changes or additions. **Figure 87** lists the approved goals.

Figure 87
Hazard Mitigation Goals

Goal 1	Educate people about the hazards (natural and man-made) they face and the ways they can protect themselves, their homes, and their businesses from those hazards.
Goal 2	Protect the lives, health, and safety of the people and animals in the County from the dangers of natural and man-made hazards.
Goal 3	Protect existing infrastructure and design new infrastructure (roads, bridges, levees, utilities, water supplies, sanitary sewer systems, etc.) to be resilient to the impacts of natural and man-made hazards.
Goal 4	Incorporate natural and man-made hazard mitigation into community plans and regulations.
Goal 5	Place a priority on protecting public services, including critical facilities, utilities, roads and schools.
Goal 6	Preserve and protect the rivers and floodplains in our County.
Goal 7	Ensure that new developments do not create new exposures to damage from natural and man-made hazards.
Goal 8	Protect historic, cultural, and natural resources from the effects of natural and man-made hazards.

4.2 IDENTIFYING, ANALYZING & PRIORITIZING MITIGATION ACTIONS

The second step outlined in the mitigation strategy involves identifying, analyzing and prioritizing a comprehensive range of specific mitigation actions. Mitigation actions include any projects, plans, activities or programs identified by participants that helps achieve one or more of the goals identified above.

4.2.1 Identification and Analysis

After developing hazard mitigation goals and reviewing the results of the risk assessment, Committee members representing the County and participating municipalities were asked to consult with their respective government entities to identify a comprehensive range of mitigation actions specific to the hazards and vulnerabilities associated with their jurisdiction. Representatives of Jo Daviess County, East Dubuque, Galena, Hanover and Stockton were asked to identify mitigation actions that ensure their continued compliance with the National Flood Insurance Program.

The compiled lists of mitigation actions were reviewed to assure the appropriateness and suitability of each action. Those actions that were not deemed appropriate and/or suitable were either reworded or eliminated. Next, each mitigation action was assigned to one of six broad categories which allowed Committee members to compare and consolidate similar actions. **Figure 88** identifies each category and provides a brief description.

Figure 88
Mitigation Action Categorization

Category	Description
Regulatory Activities (RA)	Regulatory activities are designed to reduce a jurisdiction's vulnerability to specific hazard events. These activities are especially effective in hazard prone areas where development has yet to occur. Examples include: planning and zoning, floodplain regulations and local ordinances (i.e., building codes, etc.).
Structural Projects (SP)	Structural projects lessen the impact that a hazard has on a particular structure through design and engineering. Examples include: storm sewers, road and bridge projects, storm/tornado shelters, flood walls and seismic retrofits.
Public Information & Awareness (PI)	Public information and awareness activities are used to educate individuals about the potential hazards that affect their community and the mitigation strategies that they can take part in to protect themselves and their property. Examples include: outreach programs, school programs, brochures and handout materials, evacuation planning and drills, volunteer activities (i.e., culvert cleanout days, initiatives to check in on the elderly/disabled during hazard events such as storms and extreme heat events, etc.).
Studies (S)	Studies are used to identify activities that can be undertaken to reduce the impacts associated with certain hazards. Examples include: hydraulic and drainage studies.
Miscellaneous Projects (MP)	Miscellaneous projects is a catchall for those activities or projects that help to reduce or lessen the impact that a hazard may have on a critical facility or community service. Examples include: snow fences, generators, warning sirens, etc.
Property Protection (PP)	Property protection activities are designed to retrofit existing structures to withstand natural hazards or to remove structures from hazard prone areas. In Illinois, this category of activities primarily pertains to flood protection. Examples include: acquisition, relocation, foundation elevation, insurance (i.e., flood, homeowners, etc.) and retrofitting (i.e., impact resistant windows, etc.).

Finally, each mitigation action was analyzed to determine:

- which hazard or hazards are being mitigated for;
- whether the impacts associated with a particular hazard(s) would be reduced or eliminated;
- the general size of the population affected by the action (i.e., small, medium or large);
- what goal or goals would be fulfilled;
- whether the effects on new or existing buildings and infrastructure would be reduced; and
- continued compliance with the National Flood Insurance Program.

4.2.2 Prioritization

After reviewing and analyzing the identified mitigation actions, the Planning Committee members worked together to develop a method to prioritize each action. **Figure 89** identifies and describes the four-tiered prioritization methodology adopted by the Committee. The methodology developed provides a means of objectively determining which actions have a greater likelihood of eliminating or reducing the long-term vulnerabilities associated with the most frequently-occurring natural hazards.

While prioritizing the projects is useful and does provide the participants with additional information, it is important to keep in mind that the implementation of all the mitigation actions identified is desirable regardless of which prioritization category an action falls under.

Figure 89
Mitigation Action Prioritization Methodology

		Hazard	
		Most Significant Hazard **(M)** (i.e., severe storms, severe winter storms, floods, tornadoes)	Less Significant Hazard **(L)** (i.e., drought, extreme heat, earthquakes, dam failures)
Mitigation Action	Mitigation Action with the Potential to Virtually Eliminate or Significantly Reduce Impacts **(H)**	**HM** mitigation action will virtually eliminate damages and/or significantly reduce the probability of deaths and injuries from the most significant hazards	**HL** mitigation action will virtually eliminate damages and/or significantly reduce the probability of deaths and injuries from less significant hazards
	Mitigation Action with the Potential to Reduce Impacts **(L)**	**LM** mitigation action has the potential to reduce damages, deaths and/or injuries from the most significant hazards	**LL** mitigation action has the potential to reduce damages, deaths and/or injuries from less significant hazards

4.3 IMPLEMENTING MITIGATION ACTIONS

The final step outlined in the mitigation strategy involves describing how each jurisdiction will implement the mitigation actions identified. For each of mitigation action identified by the participants, the appropriate government entity was asked to:

- identify the party or parties responsible for oversight and administration;
- determine what funding source(s) are available or will be pursued; and
- describe the time frame for completion.

In addition, a preliminary qualitative cost/benefit analysis was conducted on each mitigation action. The costs and benefits were analyzed in terms of the general overall cost to complete an action as well as the action's likelihood of permanently eliminating or reducing the risk associated with a specific hazard. The general descriptors of high, medium and low were used. These terms are not meant to translate into a specific dollar amount, but rather to provide a relative comparison between the actions identified by each jurisdiction.

The analysis is only meant to give the participants a starting point to compare which actions are likely to provide the greatest benefit based on the financial cost and staffing effort needed. It is understood that when a grant application is submitted for a specific action, a detailed cost/benefit analysis will most likely be required to receive funding.

4.4 MITIGATION STRATEGY RESULTS

Figures 90 through **100** summarize the results of the mitigation strategy. The mitigation actions identified are arranged by participating jurisdiction.

Figure 90
(Sheet 1 of 20)
Jo Daviess County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
Building & Zoning Office												
LM	Make the most recent Flood Insurance Rate Maps available at the Building & Zoning Office to assist the public in considering where to construct new buildings and make County Officials aware of these maps and issues related to construction in a floodplain.*	F	RA	Reduces	Large	1, 6, 7	Yes	Yes	Building & Zoning Office	1 year	County	Low/High
LM	Make information materials available to the public about the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Large	1, 6, 7	Yes	Yes	Building & Zoning Office	1 year	County	Low/High
EMA												
LM	Conduct county-wide hazardous substances commodity flow analysis.	MMH	S	Reduces	Medium	2, 3, 5	Yes	Yes	EMA^	1 year	75% Federal 25% Local	Low/Medium
Sheriff's Office												
HM	Retrofit the Sheriff's Conference Room to serve as an Emergency Operations Center during hazard events.	DF, EH, EQ, F, MMH, SS, SWS, T	MP	Reduces	Large	2, 3, 5	NA	NA	Sheriff's Office	TBD	TBD	Low/High
HM	Purchase and install storm warning sirens at strategic locations in unincorporated Jo Daviess County.	SS, T	MP	Reduces	Medium	2	NA	NA	Sheriff's Office	TBD	TBD	Medium/High

Figure 90
(Sheet 2 of 20)
Jo Daviess County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
Sheriff's Office Continued…												
HM	Purchase and install emergency backup generators at County buildings to provide uninterrupted power during outages.	EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	NA	Yes	Sheriff's Office	TBD	TBD	Low/High
HM	Purchase a reverse 911 telephone warning system to notify residents/ responders of emergency information.	DF, EH, EQ, F, MMH, SS, SWS, T	MP	Reduces	Large	2	NA	NA	Sheriff's Office	TBD	TBD	Medium/High
Highway Department												
LM	Conduct hydrologic/hydraulic study to determine the cause and suggest appropriate solutions to address recurring drainage and flooding issues at various locations, including but not limited to Willow Road, Bethel Road Bridge over Rush Creek and Center Road Bridge over Lawhorn Creek.	F, SS, SWS	S	Reduces	Small	2, 3, 5	Yes	Yes	Highway Department	TBD	TBD	Low/Medium
HM	Select, design and construct appropriate remedy to alleviate recurring drainage and flooding issues at various locations, including but not limited to Willow Road, Bethel Road Bridge over Rush Creek and Center Road Bridge over Lawhorn Creek.	F, SS, SWS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Highway Department	TBD	TBD	High/Medium
HM	Upsize culvert near 1540 S. Massbach Road to alleviate roadway damage caused by water overtopping the road during heavy rains.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	Highway Department	TBD	TBD	Low/Medium

Figure 90
(Sheet 3 of 20)
Jo Daviess County Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
Berreman Township												
HM	Install riprap at Fitzsimmons Road Bridge over Davis Creek south of 9458 S. Fitzsimmons Road to protect the bridge channel from scour and erosion caused by swiftly moving water.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	Township	TBD	TBD	Low/Medium
HM	Install riprap at S. Town Hall Road Bridge over the Plum River to protect the bridge channel from scour and erosion caused by swiftly moving water.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	Township	TBD	TBD	Low/Medium
HM	Upsize culvert between 13300 E. Crab Creek Road and Loran Road to alleviate recurring drainage issues.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	Township	TBD	TBD	Medium/Medium
LM	Conduct hydrologic/hydraulic study to determine the appropriate remedy to address recurring roadway flooding issues between 11221 S. Skunk Hollow Road and 11301 S. Skunk Hollow Road caused by an unnamed creek that runs parallel to the road.	F, SS	S	Reduces	Small	2, 3, 5	NA	Yes	Township	TBD	TBD	Low/Medium
HM	Select, design and construct appropriate remedy to alleviate recurring flooding issues between 11221 S. Skunk Hollow Road and 11301 S. Skunk Hollow Road caused by an unnamed creek that runs parallel to the road.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	Township	TBD	TBD	High/Medium

Figure 93
(Sheet 1 of 2)
East Dubuque Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
HM	Repair damage to 3rd Street drainage ditch sustained during repeated flash flood events.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City Council	TBD	TBD	Medium/High
HM	Modify/replace 3rd Street drainage ditch to address recurring flood issues.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City Council	TBD	75% Federal 25% Local	High/High
HM	Install riprap at 3rd Street drainage ditch from the floodgates to the Mississippi River to protect the entrance from erosion.	F, SS	SP	Reduces	Medium	2, 3, 5	NA	Yes	City Council	TBD	TBD	Medium/High
HM	Replace DeSoto Street bridge over the 3rd Street drainage ditch. The bridge has been closed since July, 2011 due to damage sustained during repeated flash flooding events which have undermined the bridge abutments.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City Council	TBD	TBD	High/Medium
LM	Update existing drainage study.	F, SS	S	Reduces	Medium	2, 3, 5	Yes	Yes	City Council	TBD	75% Federal 25% Local	Low/High
LM	Conduct storm drain inlet survey (including video reconnaissance) to identify locations where sediment has built up reducing intake/carrying capacity.	F, SS	S	Reduces	Large	2, 3, 5	Yes	Yes	City Council	TBD	TBD	Low/High
HM	Clean sediment out of storm drain inlets to maximize intake capacity.	F, SS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	City Council	TBD	City	Low/High
HM	Floodproof wastewater treatment plant, including but not limited to installation of a grit chamber to keep floodwater contaminants (i.e., sand, grit, etc.) from damaging the system.	F, SS	SP	Reduces	Large	2, 3, 5	Yes	Yes	City Council	TBD	75% Federal 25% Local	Medium/High

Figure 93
(Sheet 2 of 2)
East Dubuque Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
HM	Construct retention basins along Illinois Route 35 to manage stormwater runoff and reduce the likelihood of flooding.	F, SS	SP	Reduces	Medium	2, ,3, 5	Yes	Yes	City Council	TBD	75% Federal 25% Local	Medium/High
HM	Design and construct storm shelters with emergency backup generators at strategic locations within the City to service displaced residents.	SS, SWS, T	SP	Reduces	Medium	2	NA	NA	City Council	TBD	75% Federal 25% Local	High/High
LM	Make the most recent Flood Insurance Rate Maps available at the City Clerk's Office to assist the public in considering where to construct new buildings and make City Officials aware of these maps and issues related to construction in a floodplain.*	F	RA	Reduces	Medium	1, 6, 7	Yes	Yes	City Council	1 year	City	Low/High
LM	Make information materials available to the public about the National Flood Insurance Program's voluntary Community Rating System.*	F	PP	Reduces	Medium	1, 6, 7	Yes	Yes	City Council	1 year	City	Low/High

Figure 94
(Sheet 1 of 2)
Elizabeth Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
HM	Distribute flyer with information explaining fire whistle/siren signals.	SS, T	MP	Reduces	Large	2	NA	NA	Village Board	Ongoing	Village	Low/High
HM	Purchase and install an emergency backup generator at Village Hall/Police Station to provide uninterrupted power during power outages.	EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	NA	Yes	Village Board	3 years	TBD	Low/High
HM	Construct a dike/levee around the wastewater treatment plant to protect it from flood events.	F, SS	SP	Reduces	Large	2, 3, 5	NA	Yes	Village Board	10 years	TBD	Medium/High
HM	Clean debris/obstructions out of storm drains to maximize intake capacity.	F, SS	MP	Reduces	Medium	2, 3, 5	Yes	Yes	Village Board	Ongoing	Village	Low/Medium
HM	Replace aging water lines to prevent storm water infiltration and increase resilience to contraction and expansion of surrounding soils.	DR, F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	Village Board	Ongoing	75% Federal 25% Local	High/High
HM	Replace and relocate water mains under US Route 20 to increase resilience to contraction and expansion of surrounding soils and to reduce traffic disruptions when maintenance and repairs are conducted. US Route 20 is the main east-west route through Jo Daviess County and when a 6 inch main recently burst; the highway had to be shutdown to perform the repairs, causing adverse travel for the nearly 5,350 vehicles and 900 trucks that travel through Elizabeth each day.	DR, F, SS, SWS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	Village Board	10 years	75% Federal 25% Local	High/High

Figure 94
(Sheet 2 of 2)
Elizabeth Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
HM	Replace damaged storm drains to optimize performance of system.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	Village Board	Ongoing	TBD	Low/Medium
HM	Designate Village Hall gymnasium as a storm shelter and heating/cooling center.	EH, F, SS, SWS, T	MP	Reduces	Large	2	NA	NA	Village Board	1 year	Village	Low/High
HM	Retrofit the Village Hall gymnasium (to wind and seismic standards and equipped with an emergency backup generator, air conditioning units and upgraded bathroom and shower facilities) to serve as a storm safe shelter and heating/cooling center for residents.	EH, F, SS, SWS, T	SP	Reduces	Large	2, 3	NA	Yes	Village Board	10 years	75% Federal 25% Local	High/High
LM	Adopt new building codes to improve building safety.	EQ, F, SS, SWS, T	RA	Reduces	Medium	2, 3, 4, 7	Yes	NA	Village Board	10 years	Village	Low/High
HM	Purchase an automated telephone warning system (reverse 911) to notify residences of emergency information.	EH, EQ, F, MMH, SS, SWS, T	MP	Reduces	Large	2	NA	NA	Village Board	TBD	TBD	Medium/High
HM	Purchase and install new storm siren by water tower at US Route 20 and East Street.	SS, T	MP	Reduces	Medium	2	NA	NA	Village Board	5 years	TBD	Medium/High
HM	Insulate water tower to guard against freezing. The Village only has one water tower and it has experienced recurring freezing issues during extremely cold weather.	SWS	MP	Eliminates	Large	2, 3, 5	Yes	Yes	Village Board	TBD	TBD	Medium/High

Figure 95
(Sheet 1 of 4)
Galena Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
City												
HM	Repair or replace Bench Street/ Franklin Street storm sewer intake.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	City	2 years	75% Federal 25% Local	Low/Medium
HM	Relocate sludge building and maintenance garage out of Galena River floodplain.	F, SS	PP	Eliminates	Small	2, 3, 5	Yes	NA	City	5 years	75% Federal 25% Local	High/High
HM	Replace storm sewer flap gates in levee along the Galena River.	F, SS	SP	Reduces	Medium	2, 3, 5	NA	Yes	City	2 years	75% Federal 25% Local	Low/Medium
LM	Prepare emergency operations plan for the City.	EH, EQ, F, SS, SWS, T	S	Reduces	Large	2, 3, 4, 5, 8	Yes	Yes	City	2 years	TBD	Low/High
LM	Conduct preliminary engineering study for a new crossing of the Galena River. The Galena River runs through Galena dividing the city and right now there is only one crossing of the Galena River within the municipal limits.	F, SS	S	Reduces	Medium	2, 3, 5	Yes	Yes	City	10 years	TBD	Medium/High
HM	Design and construct a new crossing of the Galena River.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City	10 years	TBD	High/High
HM	Install riprap along the Galena River to protect the banks and bike trail from erosion.	F, SS	SP	Reduces	Small	2, 3, 5	NA	Yes	City	2 years	TBD	Medium/Medium
HM	Install diversion sewer system at Franklin Street and US Route 20 (extension of new combined sewer line from industrial complex) to increase carrying capacity and alleviate basement flooding of homes along Franklin Street.	F, SS	SP	Reduces	Small	2, 3, 5	Yes	Yes	City	2 years	75% Federal 25% Local	High/High

Figure 95
(Sheet 2 of 4)
Galena Hazard Mitigation Actions

Priority	Activity/Project Description	Hazard(s) to be Mitigated	Type of Mitigation Activity	Degree of Mitigation	Size of Population Affected	Goal(s) Met	Reduce Effects of Hazard(s) on Buildings & Infrastructure		Organization / Department Responsible for Implementation & Administration	Time Frame to Complete Activity	Funding Source(s)	Cost/Benefit Analysis
							New	Existing				
City Continued…												
HM	Upgrade downtown area storm pump station.	F, SS	MP	Reduces	Medium	2, 3, 5	NA	Yes	City	1 year	TBD	Medium/High
HM	Purchase NOAA weather radios for city employees.	EH, F, SS, SWS, T	MP	Reduces	Small	2, 3, 5	NA	NA	City	2 years	TBD	Low/Medium
HM	Perform upgrades to storm sewer system.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City	3 years	75% Federal 25% Local	Medium/High
HM	Construct stormwater detention basins to manage stormwater runoff and reduce the likelihood of flooding.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City	5 years	75% Federal 25% Local	Medium/High
HM	Purchase emergency backup generator to provide power to the drinking water well house during power outages.	EQ, F, SS, SWS, T	MP	Eliminates	Large	2, 3, 5	Yes	Yes	City	5 years	TBD	Low/High
HM	Purchase and install an emergency backup generator at City Hall to provide uninterrupted power during power outages.	EQ, F, SS, SWS, T	MP	Eliminates	Small	2, 3, 5	NA	Yes	City	5 years	TBD	Low/High
HM	Trim trees and remove dead material to minimize disruptions to electrical power and communication networks.	SS, SWS, T	MP	Reduces	Large	2, 3, 5	Yes	Yes	City	2 years	City	Low/High
HM	Conduct sewer line reconnaissance study to identify locations where storm water infiltrates the sanitary sewer lines.	F, SS	S	Reduces	Medium	2, 3, 5	Yes	Yes	City	2 years	75% Federal 25% Local	Low/High
HM	Repair sewer line sections where storm water infiltration is occurring to prevent sewage backups.	F, SS	SP	Reduces	Medium	2, 3, 5	Yes	Yes	City	2 years	75% Federal 25% Local	High/High
HM	Purchase and install storm sirens.	SS, T	MP	Reduces	Large	2	NA	NA	City	3 years	TBD	Low/High

IV. Local Hazard Mitigation Plan Development

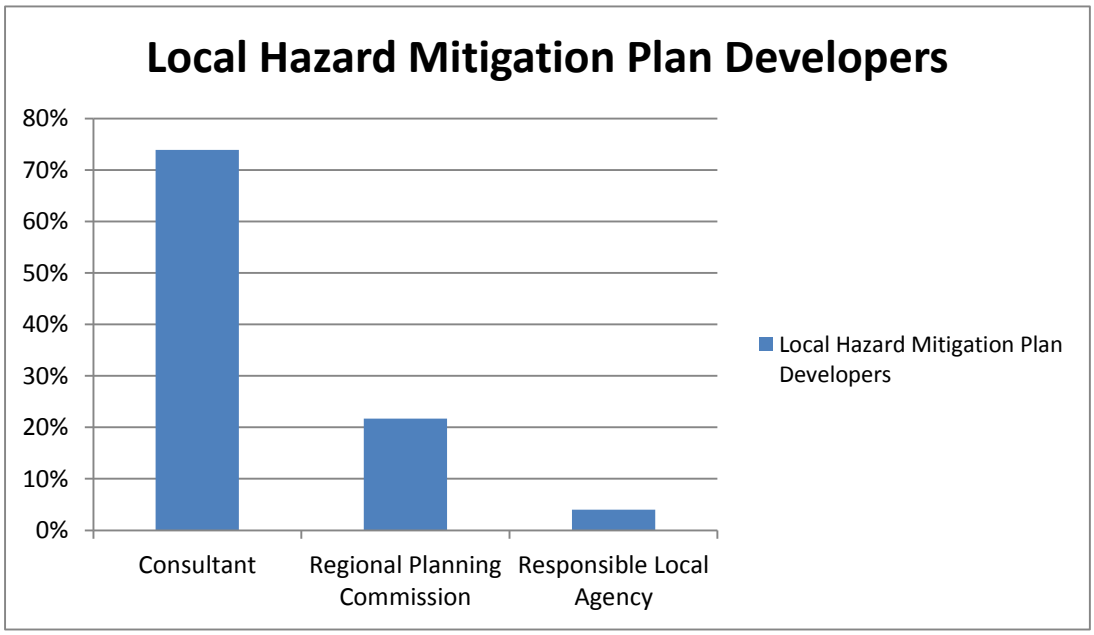
The Local Multi-Hazard Mitigation Planning Guidance 44 CFR Part 201 requires a narrative description of the process used to develop the mitigation plan. A systematic account about how the mitigation plan evolved from the moment the planning team was created and the public participated, to how it will be implemented. This description of the planning process serves as a permanent record that explains how decisions were reached and who was involved.

Illinois' LHMPs were developed utilizing the resources of a number of independent contractors, planning commissions and in-house local jurisdictional participation by a responsible agency. Twelve different consultants and regional planning commissions have been utilized in the development of Illinois LHMPs. This diversity has resulted in a variety of different planning methods and techniques. All LHMPs have incorporated public involvement at different levels. LHMPs have utilized a variety of different methods to gather public comment and input including: open meetings, interactive websites, questionnaires and surveys.

In addition a wide variety of stakeholders have been involved in the LHMPs planning process. Illinois LHMPs have been successful in engaging stakeholders that have the data and expertise needed to develop the plan, while also having the authority or responsibility to implement the hazard mitigation activities identified in the plan. This has been accomplished by involving stakeholders from emergency service agencies (emergency management, police, fire, ems), public works, public health, academia, state agencies, federal agencies, levee districts, township officials, GIS, school districts, zoning, storm water management, engineering, elected officials, private business (electrical co-operatives, insurance companies, local industry) and public residence. This diverse foundation of stakeholders provides for a planning process that integrates local knowledge into the hazard analysis and risk assessment, while developing specific actions to eliminate or reduce these risks.

All LHMPs have identified a plan maintenance section within the plan that addresses the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle. However, many of the approved LHMPs fail to compile with this schedule, resulting in difficulty in the update and implementation of the plan.

In over 95% of all of the LHMPs developed, the emergency management agency was utilized as the lead responsible agency during the planning process. Approximately 74% of all LHMPs were developed by an independent contractor, followed by Regional Planning Commissions at 22%. The remaining 4% of the LHMPs were the result of in-house development. All of these plans were updates of originally consultant developed plans. It is expected that, with over 44% of the LHMP expiring in the next 3 years, there will be an increase in the LHMP updates being conducted by local agencies with little to no consultant involvement.



The State of Illinois will require the local jurisdictions to complete the Local Hazard Mitigation Plan Review Tool. This review tool is available on the IEMA Mitigation website and through the State Hazard Mitigation Officer (SHMO) or the State Hazard Mitigation Planner. However, local jurisdictions are encouraged not to adopt the plan until it has FEMA approval.

Each local jurisdiction shall complete the following sections:

- Appendix A: Jurisdiction specific information (Contact Information) Page A-1
- Section 1: Regulation Checklist- The location of where each requirement is met in the plan is required to be entered into the Location in Plan section. Page A-2 thru A-5
- Section 3: Multi-Jurisdiction Summary Sheet (If applicable) –The multi-jurisdiction summary should be completed in the event of a multi-jurisdictional plan. Page A-10

The plan will be reviewed by State Mitigation Staff within two months of receipt of the plan. If the plan is acceptable, it will be sent to FEMA for a final review. Should a plan be unacceptable, it will be returned to the local jurisdiction with the appropriate comments provided on the Local Hazard Mitigation Plan Review Tool. When the State is notified that a local plan is acceptable pending the adoption of the plan, the SHMO or State Mitigation Planner will notify the local jurisdiction. When the adoption process is complete at the local level, the documentation will be forwarded to FEMA from IEMA.

The following three sections from local plans have to be incorporated into the Illinois Natural Hazards Mitigation Plan as they are approved by FEMA: Hazard Analysis and Risk Assessments, Inventory Assets/Loss Estimations and Mitigation Projects. When the initial local planning process for DMA2k begins (and whenever the local planning update process begins) these forms will be sent to the local jurisdiction to be completed during the planning process. These forms will be provided by the SHMO and required when the local jurisdiction's plan is submitted to IEMA for approval. When they are returned the information will be incorporated into the sections of the State plan as indicated below.

Information to complete these forms except for type of structure on the earthquake form can be found in the how-to guide mentioned above. These forms were provided when the local planning process began. When local plans receive FEMA approval this information will be incorporated into the Hazard Analysis and Risk assessment section of the State Mitigation Plan.

VI. PLAN MAINTENANCE PROCESS

A. Monitoring, Evaluating and Updating the Plan

To accomplish the monitoring and evaluation tasks, the State will make use of the FEMA planning guide series, State and Local Mitigation Planning how-to-guide: Bringing the Plan to Life. The associated worksheets of this guide, or similar data collection format, will be put to use on strategy progress reporting, evaluating the planning team, evaluating project results, revising the risk assessment, and on the general plan update itself.

Public participation strategies such as website postings and outreach through conferences and workshops will continue throughout the life of the plan. In addition to these types of outreach strategies, we have also included the post disaster mitigation briefings to explain the benefits of the program to the general public as well as potential planning bodies. Opportunities for public review will be made possible through local contacts throughout the state—via local emergency managers, planners and State Regional Coordinators.

The State recognizes that the Illinois Natural Hazard Mitigation Plan is a living document and requires regular monitoring, review and evaluation. Also, the Federal hazard mitigation planning regulations require the State plan to be updated and submitted for approval to the Regional Administrator of FEMA every three years. Monitoring of the Plan as a whole will occur during the Plan review which will begin approximately 12 months before FEMA approval is required. The Illinois Natural Hazard Mitigation Planning Committee (INHMPC) and the Mitigation Coordination and Strategy Committee (MCSC) will meet and be responsible for reviewing and evaluating the Mitigation Plan. These committees have previously been identified in the planning process section. These combined committees will meet once a year. If political or hazard events change and dictate an earlier review, then the members will be solicited via telephone or e-mail contact for their input to these changes. All members will be asked to analyze the overall success and progress in implementing the Plan.

- Review the goals and action items to determine their relevance to changing situations in the State as well as changes in policy and to ensure they are addressing current and expected conditions.
- Review the Risk Assessment and Capabilities portion, as necessary, to incorporate current information, including updated hazard profiles and any new data on vulnerable state facilities.
- Monitor progress on mitigation actions and projects in the Plan by reviewing quarterly progress reports. The database of all local plans and local action items will be reviewed as part of the process.
- Evaluate mitigation actions and projects in the Plan by reviewing the final quarterly progress report. When possible the actions will be reported on by the party responsible for its implementation, and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding and which strategies or processes need to be revised or strengthened.
- Identify implementation problems (technical, political, legal and financial) based on quarterly progress reports and input by the public and partners.
- Evaluate the effectiveness of the planning effort by using Worksheet #2: Evaluate Your Planning Team.
- Consider recommendations by the INHMPC members to increase hazard mitigation involvement by state agencies and local jurisdictions.
- Discuss changes in policies, priorities, programs and funding that alter the Plan's goals and objectives, projects and time lines.

Should the Illinois Natural Hazard Mitigation Planning Committee (INHMPC) or the Mitigation Coordination and Strategy Committee (MCSC) determine during the annual meeting that the Plan should be updated; a meeting will be scheduled for updating the Plan. Review and update will involve all of the original participants in the planning process and others identified as important for the Plan update (i.e., the Illinois Hazard Mitigation Plan Committee (INHMPC) comprised of the MCSC, other State and federal agencies, various associations from the State, business and public

sectors). A list of recommendations or enhancements compiled during the annual INHMPC meeting will be used to update the Plan. The State will update its plan as necessary to reflect:

- Hazards addressed in the Plan – All of the natural hazards that have been identified as posing a threat to the State of Illinois have been included in the Plan. As situations change or new information becomes available 1) the hazards currently included in the Plan will be updated and 2) new hazards identified as a threat will be added to the Plan.
- State owned structures – A State owned and other Critical Facilities Database is included. This database inventories all state owned structures and will be maintained, as necessary. This list is projected to be replaced with a more comprehensive GIS database for future plan updates. A detailed description of the projects movement forward to obtain this detailed information has been provided in Section III of the INHMP.
- HAZUS Analysis – HAZUS, the risk assessment software program, was attempted in previous editions of the Plan. The capability of the IEMA mitigation staff to perform the work is unmanageable. IEMA has and continues to plan on utilizing grant funds to contract the work for future plan update. IEMA continues to refer to the local mitigation plan HAZUS runs as they are completed in order to acquire the needed data. Grant funding was successfully secured for the 2013 update to conduct a HAZUS analysis regarding the flooding risks in Illinois. An individual report for each county was compiled, with county specific reports being supplied to each county's emergency management agency. These documents are available upon request; however because of the length of each HAZUS run for individual counties they are not included in this plan. The overall state report has been added to the 2013 INHMP update as an appendix.
- New mitigation actions and projects – Additional actions and projects may be identified during the Plan evaluation.
- Problem identification and resolution – Recommendations developed to overcome problems (technical, political, legal and financial) may affect the mitigation strategy.
- Incorporation of Local Plan Action Items – the Action Items listing will be updated after the final approval of the local hazard mitigation plan. The Action Items section of the State plan will be updated to reflect local plan information. As local action items are completed based on information provided by the PDM and HMGP program coordinators and county

emergency managers, the mitigation planner will compile a list and insert it into the three year update as an appendix.

- Incorporation of Local Plan Hazard Ratings- Upon the completion or update of local hazard mitigation plans, the mitigation planner will re-evaluate and incorporate the results of the local hazard ratings into the hazard ratings of the State's plan to ensure consistency and accuracy between the plans. These changes and correlations will be incorporated into the three year update as part of the State's Hazard Rating System.

This process will occur, as needed, or at a minimum every three years. The Illinois Emergency Management Agency, Disaster Assistance and Preparedness Bureau will be responsible for making the necessary changes to the Plan. The State Hazard Mitigation Officer (SHMO) has the overall authority and responsibility for maintenance of the plan. The revised Plan must be submitted for approval to the Illinois Natural Hazard Mitigation Planning Committee (INHMPC) no later than three months after the conclusion of the committee meeting. FEMA will be notified of any changes to the Plan, or will be given a justification of why no changes were deemed necessary. When revised, the Plan will be resubmitted to FEMA for their review as required by the federal DMA 2000 planning guidelines.

As stated above when sufficient changes to the Plan warrant an update, the updated Plan will be submitted to FEMA for review. Once FEMA has determined the Plan is approval pending adoption, the updated Plan must be submitted for approval by the Governor and the INHMPC no later than three months after the conclusion of the plan update meeting.

Disasters provide an opportunity to evaluate the effects of the disaster, to improve resistance to the hazard, review the accuracy of hazard specific sections and to determine if the planning efforts affected damage reduction**.** In the case of a disaster declaration in the State, the Illinois Natural Hazard Mitigation Plan can be updated if IEMA or the INHMPC believes this is necessary. A post-disaster review may replace an annual review depending upon the severity of the disaster event.

The Mitigation Staff is responsible for reviewing all Local Mitigation Plans based on the criteria established in 44 CRF 201.6 within 30 days of the arrival date and either certify or supply

comments, as needed. Upon the certification or approval of the Local Mitigation Plan, the Mitigation Staff has 180 days to update the Local Hazard Assessment, Local Capability Assessment, Actions items section and the database of the Action Item Listing sections of the Illinois Natural Hazard Mitigation Plan with the new material from the Local Mitigation Plans.

Plan Distribution

The plan, and any changes to it, will be available in an electronic format on the Illinois Emergency Management Agency website. Hard copies of the plan will be distributed to State and Federal agencies as requested and required. IEMA will maintain a distribution list for hard copies provided to such agencies to facilitate the distribution of plan revisions.

Inquiries about the plan should be directed to:
State Hazard Mitigation Officer
1035 Outer Park Drive
Springfield, IL 62704
SHMO Phone: (217) 782-8719
E-Mail: Ron.Davis@illinois.gov or Bryan.Purchis@illinois.gov
www.state.il.us/iema/

B. Monitoring Progress of Mitigation Activities

The Illinois Emergency Management Agency, Disaster Assistance and Preparedness Bureau, is responsible for the monitoring and tracking of the progress of mitigation actions. The State Hazard Mitigation Officer (SHMO) has been assigned to monitor and track the progress of mitigation measures by following-up with other agencies. In addition to the SHMO, the Mitigation Coordination and Strategy Committee (MCSC), formerly the Acquisition and Relocation Committee, has been identified in the planning process section as the committee who will monitor the progress of mitigation actions and will meet on a monthly basis for the review.

The State Hazard Mitigation Officer (SHMO) collects quarterly reports on measurable outcomes, which are then input into a database which will be distributed to all participating agencies. These reports are reviewed by the SHMO to evaluate the measurable outcomes. Once a year MCSC committee reviews the overall progress on achieving the Plan's goals. This group verifies project

close-outs and reviews the level of coordination among agencies, a key to the success in implementing the Plan.

IEMA considers the monthly/quarterly reports their tracking system. Once a project is approved it is added to the list that is discussed at the monthly MCSC meeting. Each project is discussed. Also, at the end of each quarter a progress report is submitted to FEMA listing each project. The basic change from the 2004 plan is the consistent submission of the quarterly report for each project.

Once a year the Mitigation Coordination and Strategy Committee (MCSC) will meet jointly with the Illinois Natural Hazard Mitigation Planning Committee (INHMPC) to report on the overall progress on achieving the Plan's goals, review any new information and make recommendations to the State Hazard Mitigation Officer for updating the baseline data used in the risk analysis. This information is used to reassess project prioritization, as necessary.

- Project outcomes (successes/difficulties/what could have been done better) using the last Quarterly Report as the final evaluation;
- Relevance of goals to changing situations;
- New information learned from disasters, studies or reports;
- Changes in State or federal policy;
- Risk assessment updates; and
- Level of coordination among agencies in the State

Goals, objectives and projects will be reviewed in the event of a disaster to determine whether they need to be modified to reflect the new conditions and the findings appended to the existing Plan. Based on the current conditions, the goals and projects will be reevaluated to determine if there is a need to modify the Plan. If necessary, the SHMO will update the Plan based on the recommendations of the INHMPC. Each action was looked at by members of the planning committee, and updates such as contacts, prioritization, and fund names were updated.

FEMA requires that all disasters are closed and project activity terminated within five years of a disaster declaration. The SHMO will ensure that all grant projects are closed after all approved

work has been completed or within two years of the date of project approval, whichever comes first. The SHMO will monitor all project files and fiscal issues and perform an annual site visit to ensure the community's compliance. The Project Manager is responsible for notifying the SHMO within 10 days of completion of the project. The SHMO will schedule a final site visit to review all program and fiscal records related to the project and all unspent funds being held by the community must be returned.

A programmatic and fiscal closeout ensures that all claims and costs are eligible and in compliance with the Project Application and program requirements. At the time of the closeout, all files not previously reviewed or completed will be reviewed to ensure all necessary documents are included. If a file does not contain all required documentation, the Project Manager will be required to provide the information within 30 days of closeout. When all files are complete, the SHMO prepares a spreadsheet providing the total project costs and appropriate cost shares. The Illinois Emergency Management Agency and community will comply with the Single Audit Act, as amended, and maintain all project documentation for a period of three years following project or disaster closeouts.

The State Mitigation Staff will monitor, review and evaluate the deadlines for each project and assess the status of the goals and activities throughout the year. Any recommendations regarding actions necessary to assure a project's completion will be reported to the SHMO. The SHMO in coordination with the Illinois Natural Hazard Mitigation Planning Committee (INHMPC) is responsible for monitoring and updating the plan.

While none of the methods or schedules have been changed in the update, it does not mean they were all successfully executed. Our intention in developing the initial plan was to describe what we would like to achieve in mitigation in Illinois, but we recognized that the lack of staff could hinder our efforts. Our top priority for the 2010 Update was to close-out of FEMA disasters 1469, 1513, 1633, 1681, and if possible 1722 and 1729. Unfortunately, due to staffing issues, we were only successful in closing-out 1469, 1513 and 1633. Closing-out 1722, 1729, 1771 and 1800 have become a priority for the 2013 update. Steps have been taken to procure contractual assistance and additional IEMA personnel to focus on these closeouts. Upon completion of the four

previously mentioned grants, efforts will be made to begin close-out procedures on grants from disaster 1826, 1850 and 1935 which are ready for completion.

We succeeded in keeping up with the ongoing activities. Pages five through fifteen of Section I highlight our achievements of the last three years. The State continues to make progress and improvements with the INHMP. Collaboration and partnerships between state agencies continues to be the catalyst that helps us to create a successful mitigation plan. This collaboration is seen with the continued growth of adding additional state agencies to our planning committee in an effort to obtain a better planning foundation. In addition these partnerships assist in providing increased educational opportunities, grant funding and specialized programs specific to achieving our mitigation goals in Illinois. In addition our partnerships with private, non-profit and academia organizations continue to expand, creating additional mitigation opportunities. We will continue these relationships and anticipate further growth in these partnerships.

We also achieved some of our goals related to using the IEMA website (http://www.state.il.us/iema/planning/planning.htm). The State plan and planning information is posted, and we are in the process of adding more success stories to the site as well. Safehomeillinois.org has also helped us meet many of our goals in this area. Our website now outlines all the requirements for completing a FEMA approved plan, as well as provides the tools to do so. The website is also able to provide jurisdictions with step by step instructions on how to apply for Hazard Mitigation Assistance (HMA) Grants. A “Hazard Mitigation Tool Box” was added to the IEMA website in 2013. This “toolbox” provides templates and examples for developing successful applications for HMGP grant funds and planning documents. This “toolbox” provides examples of budgets, budget narratives, scope of work, cost match letters and procurement documentation. This has proved to be a valuable asset to many of our jurisdictions seeking grant funding.

One of our most successful areas was getting local jurisdictions interested in preparing DMA2k plans. Initially, we were not able to generate any interest. Literally one by one, counties have become interested. Currently, we have sixty-four county plans and four municipality plans approved. Eighteen county plans are in process with all expected to be approved by the end of

2014. Planning interest has increased significantly over the last three years. Over 80% of Illinois' counties have had or are currently developing a hazard mitigation plan. It is our goal to continue to solicit plan updates and the creation of new plans in an effort to continue to grow the mitigation efforts in Illinois. Many of the first DM2K hazard mitigation plans that were developed and approved with in the State are requiring updates. Obtaining buy-in regarding plan updates, is proving to be more difficult than anticipated. Unfortunately, mitigation project funding is limited in its amount, resulting in the State being forced to prioritize mitigate projects throughout the state. As a result some jurisdictions, that have an approved mitigation plan, do not received funding for projects during the life cycle of their hazard mitigation plan. With budgets constraints continuing to increase in all jurisdictions, concern have been raised regarding the worth of spending additional monies and time to update hazard mitigation plans. There are many mitigation actions that can be completed by local jurisdictions with little to no funding required from the State or Federal governments, larger projects, which historically have the biggest impact on reducing the risks, are still required to maintain interest in mitigation planning. It has been suggested that by extending the number of years a local hazard mitigation plan is active would be beneficial, by allowing for a greater opportunity to utilize existing or future mitigation funds for projects. The State mitigation staff coordinates the review of these plans in the form of technical assistance and direct review before the plan is officially submitted to FEMA.

Appendix A: 2013 Risk Assessment

County Name	Population	Projected Population for the year 2020	% Change In Population	Severe Storms and Wind						Hazard Rating	Floods						Hazard Rating	Severe Winter Storms						Hazard Rating	Drought						Hazard Rating	Extreme Heat						Hazard Rating	Earthquake						Hazard Rating	Tornado						Hazard Rating
				HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O	
Adams	67,103	76,273	12.0%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	6	1	6	21	Guarded	12	2	6	1	12	33	Elevated
Alexander	8,238	9,933	17.1%	18	2	18	1	12	51	Severe	18	2	6	1	12	39	High	12	2	18	1	12	45	High	12	2	12	1	18	45	High	12	2	6	1	18	39	High	18	2	18	1	18	57	Severe	6	2	6	1	12	27	Elevated
Bond	17,768	19,154	7.2%	18	1	18	1	6	44	High	6	1	6	1	6	20	Guarded	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	12	32	Elevated	12	1	6	1	18	38	High
Boone	54,165	48,540	-11.6%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	6	1	6	1	18	32	Elevated
Brown	6,937	7,404	6.3%	18	1	18	1	6	44	High	6	1	6	1	6	20	Guarded	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	6	1	6	20	Guarded	6	1	6	1	12	26	Elevated
Bureau	34,978	38,631	9.5%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	6	44	High	6	1	6	1	18	32	Elevated	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Calhoun	5,089	5,260	3.3%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded
Carroll	15,387	17,003	9.5%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Cass	13,642	15,538	12.2%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	12	27	Elevated
Champaign	201,081	209,833	4.2%	18	1	18	2	12	51	Severe	12	1	6	2	18	39	High	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	12	2	18	39	High	6	1	12	2	6	27	Elevated	18	1	6	2	18	45	High
Christian	34,800	40,053	13.1%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	12	2	6	1	6	27	Elevated
Clark	16,335	19,791	17.5%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	6	2	6	1	6	21	Guarded
Clay	13,815	15,537	11.1%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Clinton	37,762	43,075	12.3%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	6	1	12	27	Elevated	12	2	6	1	18	39	High
Coles	53,873	58,030	7.2%	18	1	18	1	6	44	High	12	1	6	1	12	32	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	12	32	Elevated	12	1	6	1	12	32	Elevated
Cook	5,194,675	5,707,832	9.0%	18	1	18	3	18	58	Severe	18	1	6	3	18	46	High	12	1	18	3	18	52	Severe	6	1	6	3	6	22	Guarded	18	1	12	3	18	52	Severe	6	1	6	3	6	22	Guarded	12	1	6	3	18	40	High
Crawford	19,817	22,407	11.6%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	12	2	6	1	6	27	Elevated
Cumberland	11,048	12,475	11.4%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	12	2	6	1	6	27	Elevated
DeKalb	105,160	114,992	8.6%	18	1	18	1	18	56	Severe	12	1	6	1	12	32	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	6	1	6	1	6	20	Guarded
De Witt	16,561	18,914	12.4%	18	2	18	1	12	51	Severe	12	2	6	1	18	39	High	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	6	27	Elevated	12	2	6	1	18	39	High
Douglas	19,980	23,495	15.0%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	12	2	6	1	12	33	Elevated
DuPage	916,924	1,010,323	9.2%	18	1	18	3	18	58	Severe	12	1	6	3	12	34	Elevated	12	1	18	3	18	52	Severe	6	1	6	3	6	22	Guarded	6	1	12	3	18	40	High	6	1	6	3	6	22	Guarded	12	1	6	3	12	34	Elevated
Edgar	18,576	19,632	5.4%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	12	32	Elevated	12	1	6	1	6	26	Elevated
Edwards	6,721	7,514	10.6%	18	1	18	1	6	44	High	12	1	6	1	12	32	Elevated	12	1	18	1	6	38	High	12	1	6	1	18	38	High	6	1	12	1	18	38	High	6	1	18	1	12	38	High	6	1	6	1	12	26	Elevated
Effingham	34,242	42,191	18.8%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	12	1	12	33	Elevated	12	2	6	1	6	27	Elevated
Fayette	22,140	22,319	0.8%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	12	32	Elevated	12	1	6	1	12	32	Elevated
Ford	14,081	15,530	9.3%	18	1	18	1	18	56	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	18	56	Severe	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Franklin	39,561	44,535	11.2%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	6	2	6	1	18	33	Elevated	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Fulton	37,069	39,621	6.4%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	12	1	6	1	18	38	High
Gallatin	5,589	6,414	12.9%	18	2	18	1	6	45	High	18	2	6	1	12	39	High	12	2	18	1	6	39	High	6	2	6	1	18	33	Elevated	12	2	12	1	18	45	High	6	2	18	1	18	45	High	6	2	6	1	6	21	Guarded
Greene	13,886	14,872	6.6%	18	1	18	1	6	44	High	12	1	6	1	18	38	High	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	12	32	Elevated	12	1	6	1	12	32	Elevated
Grundy	50,063	46,454	-7.8%	18	1	18	1	18	56	Severe	12	1	6	1	12	32	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	6	1	6	1	18	32	Elevated
Hamilton	8,457	9,374	9.8%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	18	32	Elevated	12	1	12	1	18	44	High	6	1	18	1	12	38	High	6	1	6	1	12	26	Elevated
Hancock	19,104	22,692	15.8%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	18	2	18	1	6	45	High	12	2	6	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded	12	2	6	1	12	33	Elevated
Hardin	4,320	5,167	16.4%	12	2	18	1	12	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	18	45	High	6	2	6	1	6	21	Guarded
Henderson	7,331	8,884	17.5%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	18	2	18	1	6	45	High	12	2	6	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded	12	2	6	1	12	33	Elevated
Henry	50,486	52,418	3.7%	18	1	18	1	18	56	Severe	12	1	6	1	12	32	Elevated	18	1	18	1	18	56	Severe	12	1	6	1	18	38	High	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Iroquois	29,718	34,609	14.1%	18	2	18	1	18	57	Severe	12	2	6	1	12	33	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded	12	2	6	1	12	33	Elevated
Jackson	60,218	63,719	5.5%	18	1	18	1	12	50	Severe	18	1	6	1	12	38	High	12	1	18	1	12	44	High	12	1	6	1	18	38	High	6	1	12	1	18	38	High	6	1	18	1	12	38	High	12	1	6	1	18	38	High
Jasper	9,698	10,199	4.9%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	12	32	Elevated	12	1	6	1	6	26	Elevated
Jefferson	38,827	43,792	11.3%	18	2	18	1	12	51	Severe	12	2	6	1	6	27	Elevated	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Jersey	22,985	28,280	18.7%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	12	1	12	33	Elevated	12	2	6	1	12	33	Elevated
Jo Daviess	22,678	27,932	18.8%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	18	2	18	1	6	45	High	12	2	6	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded	6	2	6	1	6	21	Guarded

County Name	Population	Projected Population for the year 2020	% Change In Population	Severe Storms and Wind						Hazard Rating	Floods						Hazard Rating	Severe Winter Storms						Hazard Rating	Drought						Hazard Rating	Extreme Heat						Hazard Rating	Earthquake						Hazard Rating	Tornado						Hazard Rating
				HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O	
Johnson	12,582	15,414	18.4%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Kane	515,269	630,563	18.3%	18	2	18	3	18	59	Severe	12	2	6	3	12	35	Elevated	12	2	18	3	18	53	Severe	6	3	6	3	6	24	Guarded	6	3	6	3	18	36	Elevated	6	3	6	3	6	24	Guarded	12	3	6	3	12	36	Elevated
Kankakee	113,449	119,655	5.2%	18	1	18	2	18	57	Severe	12	1	6	2	6	27	Elevated	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	12	2	6	27	Elevated	6	1	6	2	6	21	Guarded	12	1	6	2	18	39	High
Kendall	114,736	78,694	-45.8%	18	1	18	2	18	57	Severe	12	1	6	2	12	33	Elevated	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	6	2	18	33	Elevated	6	1	6	2	6	21	Guarded	12	1	6	2	12	33	Elevated
Knox	52,919	57,732	8.3%	18	1	18	1	18	56	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Lake	703,462	820,250	14.2%	18	2	18	3	18	59	Severe	12	2	6	3	6	29	Elevated	12	2	18	3	18	53	Severe	6	2	6	3	6	23	Guarded	6	2	6	3	18	35	Elevated	6	2	6	3	6	23	Guarded	12	2	6	3	18	41	High
La Salle	113,924	131,155	13.1%	18	2	18	2	18	58	Severe	12	2	6	2	12	34	Elevated	12	2	18	2	18	52	Severe	6	2	6	2	6	22	Guarded	6	2	12	2	6	28	Elevated	6	2	6	2	6	22	Guarded	12	2	6	2	6	28	Elevated
Lawrence	16,833	15,675	-7.4%	18	1	18	1	6	44	High	12	1	6	1	12	32	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	12	32	Elevated	6	1	6	1	12	26	Elevated
Lee	36,031	37,939	5.0%	18	1	18	1	18	56	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	6	26	Elevated
Livingston	38,950	43,199	9.8%	18	1	18	1	18	56	Severe	12	1	6	1	12	32	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	12	26	Elevated	12	1	6	1	12	32	Elevated
Logan	30,305	32,164	5.8%	18	1	18	1	12	50	Severe	12	1	6	1	18	38	High	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	6	26	Elevated	18	1	6	1	12	38	High
McDonough	32,612	35,147	7.2%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	6	26	Elevated
McHenry	308,760	407,931	24.3%	18	2	18	2	18	58	Severe	12	2	6	2	6	28	Elevated	12	2	18	2	18	52	Severe	6	2	6	2	6	22	Guarded	6	2	6	2	18	34	Elevated	6	2	6	2	6	22	Guarded	12	2	6	2	18	40	High
McLean	169,572	187,086	9.4%	18	1	18	2	12	51	Severe	12	1	6	2	6	27	Elevated	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	12	2	18	39	High	6	1	6	2	6	21	Guarded	18	1	6	2	12	39	High
Macon	110,768	115,797	4.3%	18	1	18	2	12	51	Severe	12	1	6	2	18	39	High	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	12	2	18	39	High	6	1	12	2	6	27	Elevated	12	1	6	2	12	33	Elevated
Macoupin	47,765	55,948	14.6%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	12	1	12	33	Elevated	12	2	6	1	12	33	Elevated
Madison	269,282	285,586	5.7%	18	1	18	2	12	51	Severe	12	1	6	2	12	33	Elevated	12	1	18	2	6	39	High	6	1	6	2	6	21	Guarded	12	1	12	2	18	45	High	6	1	12	2	12	33	Elevated	12	1	6	2	18	39	High
Marion	39,437	45,651	13.6%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Marshall	12,640	14,024	9.9%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	6	1	6	1	12	26	Elevated
Mason	14,666	17,312	15.3%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	6	1	6	21	Guarded	12	2	6	1	12	33	Elevated
Massac	15,429	17,820	13.4%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	18	45	High	6	2	6	1	12	27	Elevated
Menard	12,705	14,740	13.8%	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded
Mercer	16,434	18,384	10.6%	18	1	18	1	12	50	Severe	12	1	6	1	12	32	Elevated	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Monroe	32,957	38,754	15.0%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	12	2	12	1	12	39	High	12	2	6	1	12	33	Elevated
Montgomery	30,104	31,744	5.2%	18	1	18	1	6	44	High	6	1	6	1	18	32	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	12	32	Elevated	12	1	6	1	6	26	Elevated
Morgan	35,547	39,474	9.9%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	6	26	Elevated	12	1	6	1	12	32	Elevated
Moultrie	14,846	16,911	12.2%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	12	1	12	33	Elevated	6	2	6	1	6	21	Guarded
Ogle	53,497	59,230	4.8%	18	1	18	1	18	56	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Peoria	186,494	194,083	3.9%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Perry	22,350	23,913	6.5%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	12	50	Severe	12	1	6	1	18	38	High	12	1	12	1	18	44	High	6	1	18	1	12	38	High	12	1	6	1	12	32	Elevated
Piatt	16,729	17,748	5.7%	18	1	18	1	6	44	High	12	1	6	1	18	38	High	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	6	26	Elevated	12	1	6	1	12	32	Elevated
Pike	16,430	18,123	9.3%	18	1	18	1	6	44	High	12	1	6	1	12	32	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	6	1	12	1	6	26	Elevated	12	1	6	1	12	32	Elevated
Pope	4,470	5,106	12.5%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	12	2	18	1	6	39	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	18	45	High	12	2	6	1	12	33	Elevated
Pulaski	6,161	7,891	21.9%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	12	2	18	1	12	45	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	18	2	18	1	18	57	Severe	6	2	6	1	12	27	Elevated
Putnam	6,006	6,526	8.0%	12	1	18	1	12	44	High	6	1	6	1	6	20	Guarded	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	6	1	6	1	12	26	Elevated
Randolph	33,476	35,743	6.3%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	12	1	12	1	18	44	High	12	1	18	1	12	44	High	12	1	6	1	12	32	Elevated
Richland	16,233	17,169	5.5%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	12	1	18	1	12	44	High	6	1	6	1	12	26	Elevated
Rock Island	147,546	154,941	4.8%	18	1	18	2	12	51	Severe	12	1	6	2	12	33	Elevated	18	1	18	2	12	51	Severe	12	1	6	2	18	39	High	6	1	12	2	6	27	Elevated	6	1	6	2	6	21	Guarded	12	1	6	2	12	33	Elevated
St. Clair	270,056	253,924	-6.4%	18	1	18	2	6	45	High	12	1	6	2	12	33	Elevated	12	1	18	2	6	39	High	6	1	6	2	6	21	Guarded	12	1	12	2	18	45	High	12	1	18	2	12	45	High	12	1	6	2	18	39	High
Saline	24,913	28,356	12.1%	18	2	18	1	12	51	Severe	12	2	6	1	18	39	High	12	2	18	1	6	39	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	12	2	18	1	12	45	High	6	2	6	1	12	27	Elevated
Sangamon	197,465	210,672	6.3%	18	1	18	2	12	51	Severe	12	1	6	2	18	39	High	12	1	18	2	18	51	Severe	6	1	6	2	6	21	Guarded	6	1	12	2	18	39	High	6	1	12	2	6	27	Elevated	18	1	6	2	18	45	High
Schuyler	7,544	7,528	-0.2%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Scott	5,355	6,039	11.3%	18	2	18	1	6	45	High	12	2	6	1	12	33	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	12	1	6	27	Elevated	12	2	6	1	6	27	Elevated
Shelby	22,363	24,116	7.3%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	12	32	Elevated	12	1	6	1	12	32	Elevated
Stark	5,994	6,805	11.9%	18	2	18	1	6	45	High	6	2	6	1	6	21	Guarded	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	6	1	6	21	Guarded	6	2	6	1	12	27	Elevated
Stephenson	47,711	49,268	3.2%	18	1	18	1	12	50	Severe	12	1	6	1	6	26	Elevated	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated
Tazewell	135,394	154,567	12.4%	18	2	18	2	12	52	Severe	12	2	6	2	6	28	Elevated	12	2	18	2	18	52	Severe	6	2	6	2	6	22	Guarded	6	2	12	2	18	40	High	6	2	6	2	6	22	Guarded	12	2	6	2	12	34	Elevated
Union	17,808	20,454	12.9%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	12	2	18	1	12	45	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	12	2	18	1	18	51	Severe	12	2	6	1	12	33	Elevated
Vermilion	81,625	77,363	-5.5%	18	1	18	1	12	50	Severe	12	1	6	1	18	38	High	12	1	18	1	18	50	Severe	6	1	6	1	6	20	Guarded	6	1	12	1	18	38	High	6	1	12	1	6	26	Elevated	12	1	6	1	18	38	High
Wabash	11,947	13,212	9.6%	18	1	18	1	6	44	High	12	1	6	1	12	32	Elevated	12	1	18	1	6	38	High	12	1	6	1	18	38	High	12	1	12	1	18	44	High	12	1	18	1	12	44	High	12	1	6	1	18	38	High
Warren	17,707	21,864	19.0%	18	2	18	1	12	51	Severe	12	2	6	1	12	33	Elevated	18	2	18	1	6	45	High	12	2	6	1	18	39	High	6	2	12	1	6	27	Elevated	6	2	6	1	6	21	Guarded	12	2	6	1	6	27	Elevated
Washington	14,716	16,534	11.0%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	6	39	High	6	2	6	1	6	21	Guarded	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	6	27	Elevated
Wayne	16,760	16,581	-1.1%	18	1	18	1	6	44	High	12	1	6	1	6	26	Elevated	12	1	18	1	6	38	High	12	1	6	1	18	38	High	12	1	12	1	18	44	High	12	1	18	1	12	44	High	12	1	6	1	12	32	Elevated
White	14,665	16,816	12.8%	18	2	18	1	12	51	Severe	18	2	6	1	12	39	High	18	2	18	1	6	45	High	12	2	6	1	18	39	High	12	2	12	1	18	45	High	6	2	18	1	12	39	High	12	2	6	1	12	33	Elevated
Whiteside	58,498	65,565	10.8%	18	1	18	1	12	50	Severe	12	1	6	1	12	32	Elevated	18	1	18	1	6	44	High	12	1	6	1	18	38	High	6	1	12	1	6	26	Elevated	6	1	6	1	6	20	Guarded	12	1	6	1	12	32	Elevated

County Name	Population	% Population for the year 2010	Percentage Change In Population	Severe Storms and Wind						Hazard Rating	Floods						Hazard Rating	Severe Winter Storms						Hazard Rating	Drought						Hazard Rating	Extreme Heat						Hazard Rating	Earthquake						Hazard Rating	Tornado						Hazard Rating
				HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O		HP	Gro	V	P	Sol	O	
Will	677,560	907,625	25.3%	18	3	18	3	18	60	Severe	12	3	6	3	12	36	Elevated	18	3	18	3	18	60	Severe	12	3	6	3	18	42	High	12	3	6	3	18	42	High	6	3	6	3	6	24	Guarded	18	3	6	3	18	48	High
Williamson	66,357	72,441	8.4%	18	1	18	1	12	50	Severe	12	1	6	1	12	32	Elevated	12	1	18	1	6	38	High	12	1	6	1	18	38	High	12	1	12	1	18	44	High	6	1	18	1	12	38	High	6	1	6	1	18	32	Elevated
Winnebago	295,266	337,049	12.4%	18	2	18	2	18	58	Severe	12	2	6	2	18	40	High	12	2	18	2	18	52	Severe	6	2	6	2	6	22	Guarded	6	2	12	2	18	40	High	6	2	6	2	6	22	Guarded	6	2	6	2	6	22	Guarded
Woodford	38,664	43,845	11.8%	18	2	18	1	6	45	High	12	2	6	1	6	27	Elevated	12	2	18	1	18	51	Severe	6	2	6	1	6	21	Guarded	6	2	12	1	18	39	High	6	2	6	1	6	21	Guarded	12	2	6	1	6	27	Elevated

Appendix B: Hazard Identification in Local Hazard Mitigation Plans

County Name:	Severe Storms	Flooding	Tornado	Winter Storms	Dam/ Levee Failure	Drought	Earthquake	Extreme Temp	Power Outages	Pipeline Rupture	Mine/ Ground Sub.	Terrorism CBRNE	Civil Disturbance	HAZ-MAT Release	Fire/ Explosion	Other Hazards
Adams	x	x	x		x	x	x		x	x			x	x	x	Structural Collapse, Trans.
Alexander	x	x	x	x	x		x							x	x	Trans.
Bond	x	x	x	x	x		x							x		
Boone																
Brown																
Bureau	x	x	x	x		x	x	x							x	Land Slide
Calhoun	x	x	x	x		x	x	x								
Carroll	x	x	x	x	x	x	x	x								
Cass	x	x	x	x	x									x	x	
Champaign	x	x	x	x		x	x	x						x	x	
Christian	x	x	x	x	x	x	x	x						x		
Clark	x	x	x	x	x	x	x							x	x	
Clay																
Clinton	x	x	x	x			x				x			x	x	
Coles	x	x	x	x	x	x	x		x	x		x	x	x	x	Epidemics Nuclear, Trans.
Cook																
Crawford	x	x	x	x	x	x	x	x						x		
Cumberland																
DeKalb																
DeWitt																
Douglas	x	x	x	x	x	x	x	x				x		x		Nuclear

County Name:	Severe Storms	Flooding	Tornado	Winter Storms	Dam/ Levee Failure	Drought	Earthquake	Extreme Temp	Power Outages	Pipeline Rupture	Mine/ Ground Sub.	Terrorism CBRNE	Civil Disturbance	HAZ-MAT Release	Fire/ Explosion	Other Hazards
DuPage	x	x	x	x	x	x	x	x								
Edgar																
Edwards	x	x	x	x		x	x				x			x		
Effingham																
Fayette																
Ford																
Franklin	x	x	x	x	x		x				x			x		
Fulton	x	x	x	x	x		x							x		
Gallatin	x	x	x	x	x	x	x	x			x			x		
Greene	x	x	x	x	x	x	x	x								
Grundy																
Hamilton																
Hancock	x	x	x	x		x	x	x			x					
Hardin																
Henderson	x	x	x	x		x	x	x								
Henry	x	x	x	x	x	x	x	x								
Iroquois	x	x	x	x			x	x								Railroad Incident
Jackson	x	x	x	x	x		x				x					
Jasper	x	x	x	x		x	x	x			x					
Jefferson	x	x	x	x			x							x		
Jersey																
Jo Daviess	x	x	x	x	x	x	x	x				x		x		Waste Remediation
Johnson	x	x	x	x		x	x	x						x	x	
Kane	x	x	x	x	x		x									
Kankakee																
Kendall	x	x	x	x		x	x	x						x	x	
Knox	x	x	x	x		x	x	x						x	x	

County Name:	Severe Storms	Flooding	Tornado	Winter Storms	Dam/ Levee Failure	Drought	Earthquake	Extreme Temp	Power Outages	Pipeline Rupture	Mine/ Ground Sub.	Terrorism CBRNE	Civil Disturbance	HAZ-MAT Release	Fire/ Explosion	Other Hazards
Lake	x	x	x	x	x	x	x	x								Erosion
LaSalle	x	x	x	x		x	x	x								
Lawrence																
Lee	x	x	x	x	x	x	x	x				x		x		Nuclear
Livingston	x	x	x	x	x			x	x					x		Radiological, Trans.
Logan																
McDonough	x	x	x	x		x	x	x						x	x	
McHenry	x	x	x	x	x	x	x	x								
McLean																
Macon	x	x	x	x	x	x	x	x						x		Nuclear
Macoupin	x	x	x	x	x		x							x		
Madison																
Marion																
Marshall	x	x	x	x	x	x	x								X	Land Slide, Trans.
Mason																
Massac	x	x	x	x	x		x							x	x	
Menard	x	x	x	x	x		x							x		
Mercer	x	x	x	x		x	x	x			x					
Monroe	x	x	x	x			x	x						x	x	
Montgomery	x	x	x	x	x	x	x	x								
Morgan																
Moultrie																
Ogle	x	x	x	x	x	x	x	x				x		x		Nuclear
Peoria	x	x	x	x		x	x	x			x					Landslide, Wildfire
Perry	x	x	x	x			x				x			x		
Piatt	x	x	x	x		x	x	x						x	x	
Pike	x	x	x	x		x	x	x			x					

County Name:	Severe Storms	Flooding	Tornado	Winter Storms	Dam/ Levee Failure	Drought	Earthquake	Extreme Temp	Power Outages	Pipeline Rupture	Mine/ Ground Sub.	Terrorism CBRNE	Civil Disturbance	HAZ-MAT Release	Fire/ Explosion	Other Hazards
Pope																
Pulaski	x	x	x	x	x		x							x		
Putnam	x	x	x	x		x	x									
Randolph																
Richland	x	x	x	x	x	x	x	x						x	x	
Rock Island	x	x	x	x	x	x	x	x						x		
St. Clair	x	x	x	x	x		x	x			x			x	x	
Saline	x	x	x	x	x	x	x	x			x			x	x	
Sangamon	x	x	x	x	x	x	x	x			x					
Schuyler	x	x	x	x	x	x	x	x						x	x	
Scott																
Shelby																
Stark	x	x	x	x		x	x	x							x	Land Slide
Stephenson	x	x	x	x		x	x	x	x			x	x	x	x	Pandemic, Nuclear, Trans.
Tazewell	x	x	x	x		x	x	x			x					Landslide
Union	x	x	x	x	x		x							x	x	
Vermilion																
Wabash																
Warren																
Washington																
Wayne																
White	x	x	x	x	x	x	x	x						x		
Whiteside																
Will	x	x	x	x	x	x	x	x		x	x	x	x		x	Public Heath, Trans.
Williamson	x	x	x	x		x	x	x			x			x		Landslide
Winnebago	x	x	x	x		x	x	x								
Woodford	x	x	x	x	x		x				x				x	Landslide

Appendix C: Illinois Statewide Flood Hazard Assessment

ILLINOIS STATEWIDE FLOOD HAZARD ASSESSMENT

July 22, 2013

Submitted to:
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Springfield, IL 62704

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I. Executive Summary

The Illinois Emergency Management Agency contracted with the Natural Hazard Research and Mitigation Group at Southern Illinois University, Carbondale to perform a statewide flood-hazard and vulnerability assessment. For this assessment, flood risk was assessed using the Federal Emergency Management Agency's (FEMA's) Hazus-MH software to estimate building related floor exposure and losses. The flood vulnerabilities of Illinois jurisdiction were quantified and ranked using flood-loss and social-vulnerability parameters to develop a flood vulnerability index. Other products from this study included county-level flood-hazard assessment for each of the State's 102 counties and a flood-risk analysis of State-owned facilities. The intent of the State, county, and jurisdictional flood hazard assessment was to help inform planners and decision makers at all levels about flood hazards and flood vulnerability in their respective jurisdictions in order to augment community resilience through appropriate flood mitigation strategies.

The 100-year floodplain in Illinois encompasses approximately 7,140 mi^2 in Illinois or 13% of the State. Within the 100-year floodplain, we have identified $190.25 billion in building-related-flood exposure and the corresponding building-related-flood losses are estimated to be $18.39 billion dollars (2006 dollars). The major of these building-related-flood exposures and losses ($120.91 billion and $10.18 billion, respectively) are located within the City of the Chicago, in greater Cook County, and in the surrounding counties.

Unlike flood exposure and losses, which are concentrated in the urban and suburban areas surrounding Chicago, the most flood-vulnerable communities in Illinois are the rural jurisdictions located along the State's larger rivers. Flood vulnerability analysis suggests the urban and suburban communities within the Chicago metropolitan region would, in general, be more resilient (possess greater resources for recovery) than rural river communities. This difference in flood vulnerability is despite the smaller flood losses in rural areas, in absolute terms, compared to the urban and suburban areas. The greatest concentration of jurisdictions with high flood vulnerability ratings is in the southern Illinois counties bordering the Mississippi and Ohio Rivers.

Levee protection is an issue of concern in Illinois, presently. Recent inspections by the U.S. Army Corps of Engineers (USACE) have found significant deficiencies in 108 of the participating 123 levee systems in Illinois (88%). Thirty-four of these levee systems are of particular concern because they have been rated unacceptable by the USACE, which means these levees may not perform as designed during a major flood. We estimate that the levee systems in Illinois provide flood protection at varying levels to $25.01 billion in building-related infrastructure.

We identified 405 essential or critical facilities located on 100-year floodplains in Illinois. Of these 405 facilities, 5 were Stated-owned, comprising $44.75 million in flood exposure and $24.27 million in estimated damages (modeled for a 100-year flood). The remaining 400 essential or critical facilities were owned by local governments, private companies or not-for-profit groups. The majority of at-risk

essential facilities were schools (95 statewide), fire stations (48), and police stations (26). The majority of at-risk critical facilities were waste-water treatment (146), potable-water treatment (33), and communication facilities (25).

II. Introduction

The Illinois Emergency Management Agency (IEMA) is responsible for supporting activities that can reduce losses which result from natural hazards. Successful mitigation activities require realistic and quantitative assessment of the probability and impact of a particular hazard on a given community or region. Assessment of risk and potential economic impacts informs mitigation planning and allows prioritization of activities to ameliorate disasters impacts.

Flooding is one of the most costly hazards facing the citizens of Illinois. Flood losses recorded in the National Oceanic and Atmospheric Administration's (NOAA) Nation Climatic Data Center (NCDC) database exceeded $5.5 billion in Illinois between 1993 and 2012. Since 1965, flooding was the either the main or a significant contributing factor for 32 out of the 52 Presidential Disaster Declarations declared in Illinois.

IEMA contracted with the Natural Hazard Research and Mitigation Group (NHRMG), at Southern Illinois University at Carbondale (SIUC) to perform a state-wide flood hazard and vulnerability assessment. Flood risk was assessed using the Federal Emergency Management Agency's (FEMA's) Hazus-MH flood software to estimate building-related flood exposure and losses. Using the flood-exposure and -loss estimates, a flood loss index (FLI) was generated. The social vulnerability index (SoVI) of Cutter (2013) was used to assess each community's ability to cope with/recover from flood losses. The social vulnerability index attempts to quantify the characteristics of a population that determine relative levels of resilience to the impacts of natural hazards (Cutter, 2013). The FLI and SoVI were combined to create a flood vulnerability index (FVI) which was used to quantify and relative rank each Illinois' jurisdictions in terms of relative flood vulnerability. This ranking system was intended to help quantify and/or prioritizing mitigation planning efforts and projects.

Other products from this study include: 1) an individual flood-hazard assessment for each of the 102 Illinois counties; 2) a flood-risk assessment of State-owned facilities; and 3) updates to the State's essential and critical facility database. The purpose of the county flood-hazard assessment is to help inform regional, county, and local planners and decision-makers about the flood hazard in their communities in order to guide mitigation strategies that will decrease vulnerability and increase resilience to flood disasters. The flood-risk assessment of State-owned facilities is intended to help the state identify at-risk facilities and quantify their potential flood losses.

III. Methods

IV. Data Sources

This section outlines thee geospatial, hydrologic, historic flood losses, and social vulnerability data sources used to generate the Illinois Statewide flood-hazard-assessment and the county-level flood-hazard assessment.

V. Geospatial Data Sources

VI. Floodplain Maps

We compiled a 100-year floodplain data layer for the State of Illinois. This layer was compiled from two primary sources: 1) the FEMA digital flood rate insurance rate maps (DFIRMS) where available and 2) digitized versions of FEMA's flood insurance (FIRM) rate maps where DFIRMs were not available. The DFIRMs were obtained from the FEMA Map Service Center, and the digitized FIRMs were compiled and edited from the Illinois State Water Survey's (ISWS's) "One-Hundred and Five-Hundred Flood-zones for Unincorporated Areas in Illinois" (ISWS, 1996). In Massac and Warren counties, DFIRMs were available for certain communities. In order to incorporate the most updated floodplain delineations we merged the DFIRM with the FIRM to create a hybrid layer that defined the 100-year floodplain in these counties. In Madison, Monroe, and St. Clair Counties, preliminary DFIRMs we obtained from the local jurisdictions were used to define the 100-year floodplain boundary. Figure 1 shows which map types were used to delineate the 100-year floodplain statewide.

Digital Elevation Model

Digital Elevation Models (DEMs) for the Hazus-MH flood-loss analysis were downloaded from the United States Geologic Survey's National Map. We used 1/3-arc-second (~10 m resolution) DEMs for the flood-loss analyses performed in this study.

VII. Essential and Critical Facilities, Locally Owned

For this study we created a database of essential and critical facilities for the State of Illinois. Essential facilities are defined as those that provide vital emergency response and recovery following a disaster. These facilities include emergency operation centers, hospitals, fire stations, police stations and schools. Critical facilities are defined as facilities that provide vital services or resources to a community. These facilities include water treatment, waste water treatment, power, communication, liquid fuels (oil and gas), and other user-defined critical facilities. SIUC has compiled essential and critical facility database from the best publicly available state and federal sources. For the 43 Illinois counties which SIUC has previously prepared county pre-disaster mitigation plans, the state and federal data were replaced here

with local essential and critical facility data, or else the available federal and state data were reviewed and updated by local subject-matter experts.

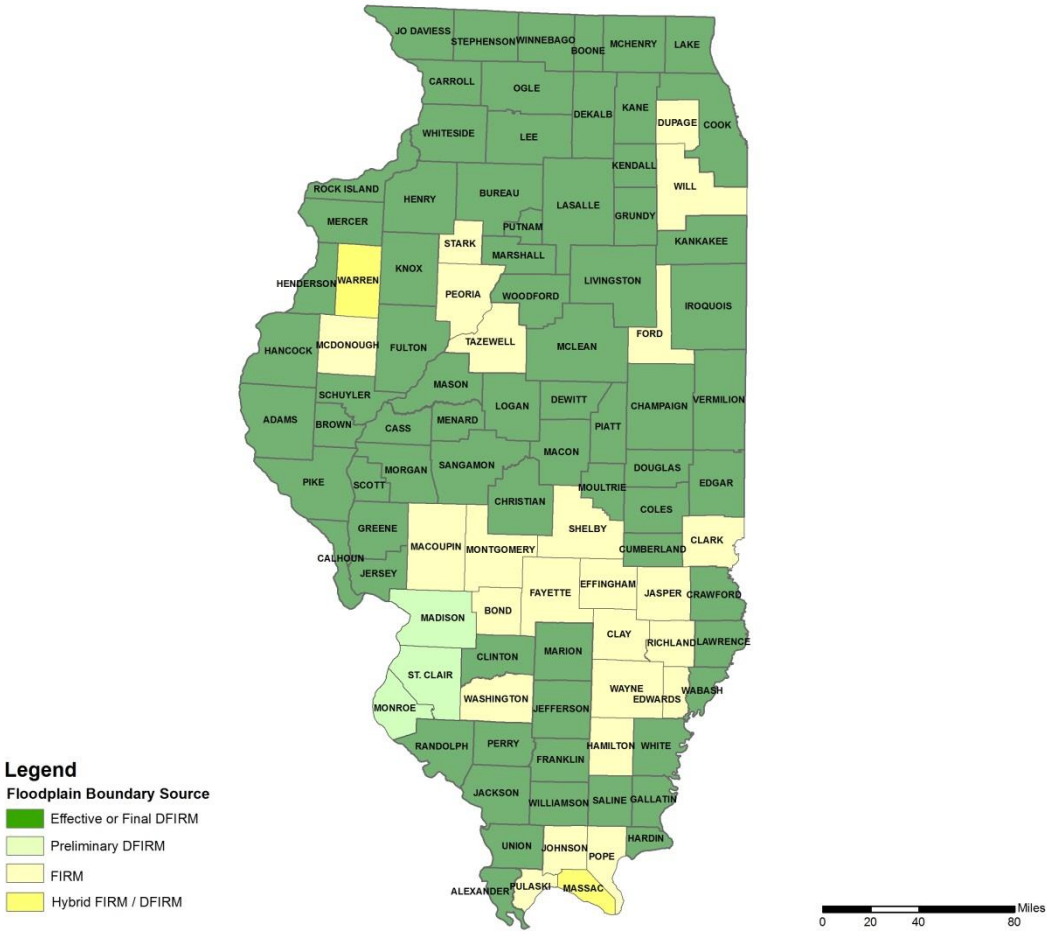

Figure 1 – Data sources for the 100-year floodplain boundaries used in this study.

VIII. Essential and Critical Facilities State Owned

A geodatabase and an Excel worksheet containing non-georeferenced State critical and essential facilities were provided by IEMA to the NHRMG. This facility information was provided to SIUC in order to assess the flood risk to the State-owned essential and critical facilities. The non-georeferenced State facilities were georeferenced and added to the State's existing essential and critical facility database. To georeference these facilities, we used the street addresses and/or facility names provide to us to locate the geographic position of these facilities using Google Maps or MapQuest. Once the facility was located, the geographic position (latitude and longitude) was entered into the corresponding state facility geodatabase using ArcMap. Once entered, the location of each of these facilities was visually

inspected on the most recently available aerial photographs (circa 2011-2012) in ArcMap to ensure the facility was in its proper geographic location.

IX. Levees

For this study, we compiled a levee database for the State of Illinois. Information in this database was collected largely from two main sources: 1) The Scientific Assessment and Strategy Team's (SAST) levee database (SAST, 1995) and 2) the USACE's National Levee Database (USACE, 2013). The locations of the levees in this database were checked for accuracy and corrected if necessary against high-resolution geo-referenced aerial photography and DEMs.

Cartographic Data Sources

The sources of cartographic data, such as road, political boundaries, water bodies, etc., used in creation of the statewide and county reports are presented in Table 1.

Table 1 –Cartographic data sources

Data Type	Source
Political Boundaries	US Census (2010)
Roads and Highways	IL Department of Transport (2010)
Rail Roads	IL Department of Transport (2010)
Dams	USACE National Dam Database (FEMA, 1993)
Hydrologic Features	USGS National Hydrographic Data Set (2012)

X. Social Vulnerability Index

Social vulnerability was incorporated into the flood vulnerability assessment undertaken here. Social vulnerability describes characteristics of a population that determine relative levels of resilience to the impact of natural disasters. Social vulnerability can help to explain why some communities' experience greater hardship and/or recover more slowly than others, for similar magnitudes of floods ore other events (Cutter, 2010). For this study, we employed the widely cited social vulnerability index (SoVI) for each of Illinois' county. Values of SoVI were calculated by the Hazards and Vulnerability Research Institute (HVRI) at the University of South Carolina (HVRI, 2012). SoVI was developed using principal component analysis (PCA) that assessed an array of socio-economic variables derived primarily from the U.S. Census data. The socio-economic variables in the PCA were selected based on the social science research identifying factors that influence a community's ability to prepare for, respond to, and recover from a natural disaster, such as flooding (Cutter et al., 2013).

XI. Historic Hydrologic and Flood Loss Data Sources

Stream gage information for this study was compiled from two sources. Stream gage locations and information were from the U.S. Geological Survey's (USGS's) National Water Information System (USGS, 2013). Flood stage categories, flood impacts, and historical flood levels/crest information were compiled from the National Ocean and Atmospheric Administration's (NOAA's) National Weather Service (NWS) Advanced Hydrologic Prediction Service's (ADHPS) gage information database (NWS, 2013a). Flood casualty, damage, and loss data were obtained from NOAA's National Climate Data Center (NCDC) storm event database (NOAA, 2013b)

XII. Flood-Hazard Assessment

The county-level flood-hazard assessment for all 102 Illinois counties consisted of three main components: 1) a review of each county's historical occurrences of flooding; 2) flood -exposure and -loss modeling; and 3) a flood-risk screening for at-risk essential and critical facilities. To describe, qualify, and quantify occurrences of flooding in each county we reviewed and compiled information from: USGS hydrological records, Flood Insurance Study (FIS) reports, ADHPS gage information database, and from NCDC's storm event database.

XIII. Flood-Loss Modeling

The flood-loss modeling in this study was performed using Hazus-MH. Hazus-MH is a Geographic Information System- (GIS-) based risk assessment tool designed by FEMA in collaboration with the National Institute of Building Sciences. The Hazus-MH flood module assesses the impact of flooding based on FEMA and USACE damage relationships. These relationships are applied to Hazus-MH infrastructure inventories or user-defined facilities to estimate losses for a selected flood scenario (Schneider and Schauer, 2006).

Hazus-MH allows modelers either to choose default settings ("Level 1" analysis) or else to provide increasingly detailed user-supplied data to improve the resolution and accuracy of loss estimates ("Level 2" or "Level 3" analyses). For a Level 1 analysis, the demographic and infrastructure inventories provided with the Hazus-MH package are not significantly updated. The Hazus-provided demographic and infrastructure inventories are compiled from existing national datasets. A Level 2 analysis improves the loss estimates by considering additional data such as improved flood inundation modeling results or significant updates to the demographic and / or infrastructure inventory. A Level 3 analysis generally requires extensive time, resources, and effort in order to modify the Hazus-MH model to fit specific community, location, or geographic region. An example of a Level 3 analysis would be a study in which

site-specific building inventory data are used to calculate flood losses for individual building. This type of analysis is referred to as a user defined facility (UDF) analysis.

We performed Level 1 Hazus-MH flood-loss-modeling for each Illinois County's flood-hazard assessment report. Updating building and infrastructure data or performing hydraulic modeling to created detailed depth grids for all counties in Illinois could be done in the future but was beyond the scope of this project. For each county, we estimated the potential flood losses within the 100-year floodplain. In counties with FEMA-accredited levees we performed a levee fails "scenario" in which in addition to the inundation of the unprotected 100-year floodplain, we modeled flooding of areas protected by the levee(s) up to the 100-year flood level. It is important to note these flood scenarios do not represent a realistic flood. It is highly unlikely that all rivers and streams in a given jurisdiction, let alone the whole state of Illinois, would experience a 100-year event at the same time. Hence, the flood losses presented here should be viewed as a standardized estimate of building-related-flood losses which allows for a comparison of flood risk between Illinois's jurisdictions.

Hazus-MH requires the construction of a flood-depth grid to define the area of potential flood inundation. To construct the flood-depth grids here, we employed Hazus-MH's Enhanced Quick Look (EQL) tool. The data required to generate a flood-depth grid using the EQL tool are a polygon layer representing the extent of the flood, in this case the 100-year floodplain, and a DEM representing floodplain topography. In each county we used the DFIRM or digitized FIRM map when a DFIRM was not available to delineate the 100-year flood boundary (Figure 1). A 1/3-arc-second (10 m) DEM was used to depict floodplain topography. Hazus-MH default aggregate General Building Stock (GBS) data were used for the loss estimation. The aggregated general building stock uses building valuations from Dunn and Bradstreet's 2006 R.S. Means Values. Consequently, the flood-loss and flood-exposure estimations presented in this report are in 2006 dollars.

Hazus-MH flood-losses reported in this study are for building-related losses only. Building-related losses include building damages, building-inventory damages, and commercial-inventory damages. These building-related flood-loss estimates do not include damage to infrastructure (i.e., roads, bridges, utilities, etc.), agricultural losses, or indirect economic losses (secondary losses). In addition, these flood-loss and the exposure estimates are based on full replacement cost (i.e., the estimated cost to replace the damaged portion of a building). Hence, the resulting flood losses estimates may be significantly higher than insured losses or loss estimates calculated using property assessment data. Insured losses and loss estimates using assessor's data commonly use the fair-market value, which include depreciation of building values after initial construction.

XIV. Flood Risk Analysis for Locally Owned Essential and Critical Facilities

Our essential and critical facility database was used to screen for at-risk facilities. This was accomplished by over-laying in a GIS each county's mapped essential and critical facilities with the county's DFIRM or FIRM map and identifying the facilities located within the 100-year floodplain. Facilities identified within

the floodplain were listed in the statewide flood-hazard assessment report and listed and mapped in the county's flood hazard assessment report.

XV. Flood Risk Analysis for State Owned Facilities

A Hazus-MH UDF flood-loss analysis was performed on State owned essential and critical facilities identified within the 100-year floodplain. A UDF flood-loss analysis is a structure-by-structure analysis in which flood losses are calculated for specific building or buildings using depth-damage functions within Hazus-MH. UDF analysis requires certain building parameters which were not available from the IEMA essential and critical facility database. These missing data were replaced with default values, based on occupancy type, from FEMA's Hazus-MH Flood Model Technical Manual (FEMA, 2012). The missing parameters included square footage, building material, foundation type, and number of stories (see Table 2 for values used). As with the county-level-flood-loss modeling, a flood-depth grid was constructed using Hazus-MH's EQL tool employing either a DFIRM or digitized FIRM map for the floodplain boundary and a 1/3-arc-second DEM (10 m) for floodplain topography.

Table 2 - List of building parameters used in the UDF flood-loss analysis for State-owned essential and critical facilities.

Facility Type	Occupancy Class	Average Square Footage (ft^2)	Estimated Replacement Cost ($Millions)	Building Material	Foundation Type	Number of Stories
Armory	IND2	30,000	$2.27	Masonry	Concrete Slab	1
Correctional Center	RES3F	60,000	$7.92	Masonry	Concrete Slab	1
Government Building	GOV1	11,000	$1.18	Wood	Concrete Slab	1
Illinois Department of Transportation Regional Headquarters	COM4	80,000	$10.67	Masonry	Concrete Slab	1
Illinois State Police Barracks	GOV2	11,000	$1.83	Masonry	Concrete Slab	1

XVI. Flood Vulnerability Screening

For this study we quantified flood vulnerability as a combined function of potential building-related-economic losses and socioeconomic factors. We incorporated differences in socioeconomic factors into our analysis because the current social science research suggests that a community's wealth, gender distribution, race, class, and sociopolitical structures can influence the impacts of flood losses, casualties, and the ability the community to recover from a flood disaster. These social factors produce

variations in vulnerability among groups of people and geographic locations (Ngo, 2001; Tierney, 2006; Enarson, 2007; Burton and Cutter, 2008, Cutter et al., 2013). To capture both the economic and social aspects of flood vulnerability, we used Hazus-MH to quantify potential flood losses within the 100-year floodplain and county-level SoVI scores to quantify the social component of a jurisdiction's flood vulnerability.

Screening of the flood vulnerability of Illinois counties and incorporated jurisdictions was accomplished by calculating a Flood Vulnerability Index (FVI) using the Hazus-MH flood-exposure and loss-estimates and SoVI score. Each county's and jurisdiction's FVI score was then used to rank their flood vulnerability. The FVI values were calculated as follows:

1. The flood-exposure ($Flood_{exposure}$) and -loss ($Flood_{loss}$) estimates for the 100-year floodplain were calculated using Hazus-MH (see Flood-Loss Modeling section above for details).

2. A flood loss ratio ($Loss_{ratio}$) was calculated to normalize flood-loss estimation parameter so that urban jurisdictions with large absolute values of flood exposure could be more easily compared with rural jurisdictions with smaller levels of flood exposure.

$$Loss_{ratio} = \frac{Flood_{loss}}{Flood_{exposure}}$$

(Eq. 1)

3. The SoVI (HVRI, 2012) was assigned to its respective county and jurisdictions.

4. Hazus-MH does not calculate flood exposure and losses at jurisdictional scales. The minimum spatial scale at which Hazus-MH calculates flood exposure and losses is at the census block level. In order to ascribe the exposure and flood estimates to a particular jurisdiction, we used the spatial join tool within ArcMap. The join tool summed flood -exposure and -loss estimates from the census blocks that were either fully or partly contained within each jurisdiction's boundaries.

5. In order to account for the overlap of census blocks outside a jurisdictional boundary, a floodplain area weighting factor was calculated and then used to weight the jurisdictional flood-loss ratio. This provided a more realistic estimate of a jurisdiction's flood-loss ratio. The floodplain area weighting factor (FP_{wf}) was calculated by dividing the 100-year floodplain area (FP_{area}) within the jurisdiction by the total area of the jurisdiction (JD_{area}).

$$FP_{wf} = \frac{JD_{area}}{FP_{area}}$$

(Eq. 2)

The floodplain area weighting factor was then multiplied by the jurisdiction's loss ratio to calculate the weighted flood loss ratio ($WLoss_{Ratio}$).

$$WLoss_{Ratio} = Loss_{Ratio} \times FP_{wf}$$

(Eq. 3)

6. The county flood-loss ratio, jurisdictional weighted flood-loss ratio and SoVI scores were combined to create a flood-loss index (FLI) and SoVI at the county and jurisdictional levels. The general indexing formula for the FLI and SoVI are as follows. The index (I_i) corresponding to each respective index (FLI and SoVI) indicator for i^{th} county or jurisdiction is calculated using the following equation, which normalizes each index value to a range from 0.0 to 1.0:

$$I_i = \frac{I_i - I_{min}}{I_{max} - I_{min}}$$

(Eq. 4)

where I_{min} *and* I_{max}, are the minimum and maximum values of these indicators for all the counties or jurisdictions, respectively, and I_i is the actual value of the indicator for i^{th} county or jurisdiction.

7. The FLI and SoVI were added together to calculate a flood score (*FS*) for each county and jurisdiction.

$$FS = FLI + SoVI$$

(Eq. 5)

8. The *FS* were normalized so each county or jurisdiction could be ranked by flood vulnerability relative to other Illinois counties and jurisdictions. The flood score was index (FS_i) was calculated using Equation 4.

9. A z-score (*z*) for the FS_i for each county or jurisdiction was calculated in order to rigorously qualify their relative flood vulnerability.

$$z = \frac{FS_i - \mu}{\sigma}$$

(Eq. 6)

where:
FS_i is the actual flood score for i^{th} county or jurisdiction;

is the mean of the county or jurisdictional flood scores; and
σ is the standard deviation the flood scores.

The z-score was used to assign the relative flood vulnerability description to each jurisdiction (Table 3).

Table 3 – Relative flood vulnerability description for the z or standard score

z – Score Range	Relative Flood Vulnerability Description
5.0 to 1.6	High
1.9 to 0.6	Elevated
0.5 to -0.5	Average
-0.6 to -3.0	Low

XVII. Results

XVIII. Illinois' Floodplains and Levees

FEMA-mapped 100-year floodplains in Illinois encompass approximately 7,140 mi^2 or 13% of the State. Within the total Illinois floodplain area, we have identified 143 levees, together protecting 1,500 mi^2 of floodplain. Protection levels of Illinois's levees range from 5- to 10-year flood which are generally privately owned and constructed levees up to 100- and 500-year flood protection level for federally constructed levees which usually protect developed or urban areas (Figure 2).

Of the 143 levees identified, the National Levee Database indicates 124 of these participate in or are eligible for the USACE's Public Law 84-99 program (PL-84-99). Enrollment in the PL-84-99 program provides reimbursement for some-flood related damages for levees that are actively maintained and pass regular inspections. Maintenance and proper operation of the levee are intended to prevent routine damage and reduce the possibility of levee failure. In the case of severe flood-related damage to a participating levee, the USACE will provide post-damage assistance.

USACE's levee inspection records showed that 10 of the levee systems in Illinois were rated as "acceptable", 84 levee systems were rated as "minimally acceptable", 28 levees were rated as "unacceptable" or inactive, and 2 were not rated. An acceptable rating indicates no "unacceptable" rating on any inspection criteria, and significantly more "acceptable" criteria ratings than "minimally acceptable" ratings. Minimally acceptable indicates no "unacceptable" rating on any inspection criteria, and generally fewer "acceptable" criteria than "minimally acceptable" ratings. An "unacceptable" levee rating indicated one or more "unacceptable" results on any of the inspection criteria. Unacceptable ratings are generally interpreted to mean that a levee has one or more structural or operational deficiency that could result in it not performing to design specification during a large flood. Levees with an overall unacceptable rating are often moved from active to inactive status within the PL-84-99 program until the necessary repairs to the levee system are made. See the Non-Federal Flood Control Works Inspection Guide (ER 500-1-1; Appendix E) for further details on the USACE levee rating system. Table 4 lists unacceptable and inactive levees in Illinois; Appendix A lists and tabulates details for all 143 levees identified in Illinois.

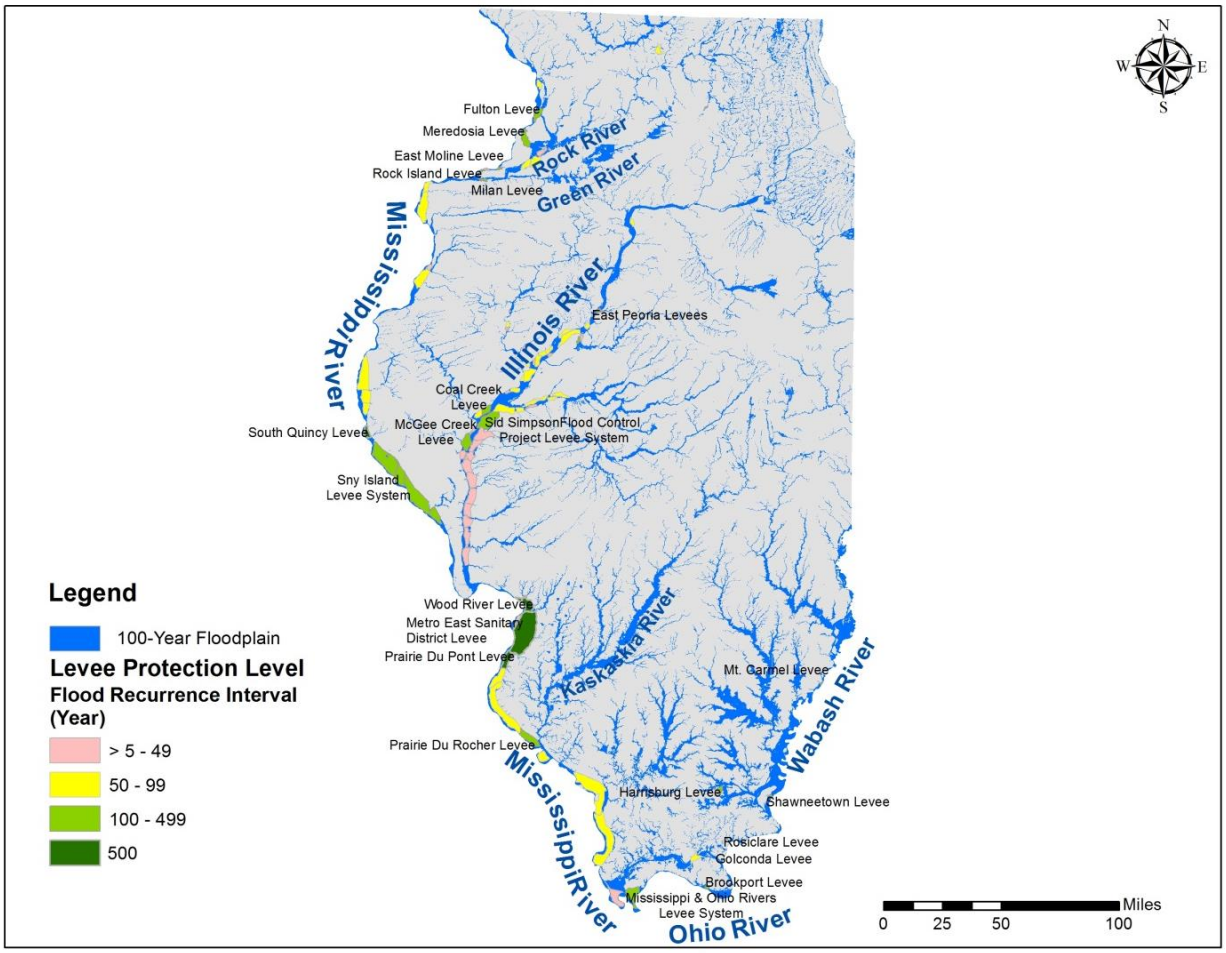

Figure 2 – 100-year floodplain extent and levees in Illinois. Levees with a protection level of ≥100-year flood are labeled.

Table 4 –PL-84-99 levees in Illinois that have an unacceptable or inactive rating

Levee District Name	County	River or Stream	Protected Area (Acres)	Protection Level (Years)	Recent Inspection Rating	Inspection Date
Metro East D&LD	Madison	Mississippi River	85,977	500	Unacceptable	5/22/2010
East Peoria Sanitary District	Tazewell	Illinois River	20	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	355	100	Unacceptable	4/11/2012
East Peoria D&LD	Tazewell	Illinois River	17	100	Unacceptable	4/11/2012
East Peoria D&LD	Tazewell	Illinois River	1,049	100	Unacceptable	4/11/2012
East Peoria Sanitary District	Tazewell	Illinois River	37	100	Unacceptable	4/11/2012
East Peoria	Tazewell	Illinois River	93	100	Unacceptable	4/11/2012

Levee District Name	County	River or Stream	Protected Area (Acres)	Protection Level (Years)	Recent Inspection Rating	Inspection Date
Sanitary District						
East Peoria Sanitary District	Tazewell	Illinois River	94	100	Unacceptable	4/11/2012
Shawneetown LFPP	Gallatin	Ohio River	9,45	100	Unacceptable	12/13/2005
Brookport	Massac	Ohio River	1,185	100	Unacceptable	6/3/2010
Mississippi & Ohio Rivers LS	Alexander	Mississippi and Ohio	16,584	100	Unacceptable	4/16/2012
DeKalb LFP: LDB South Branch	DeKalb	Kishwaukee	183	100	Inactive	Not Available
East Peoria Sanitary District	Peoria	Illinois River	81	100	Unacceptable	4/11/2012
Penny Slough D&LD	Whiteside	Rock River	9,495	50	Unacceptable	4/3/2012
Hennepin D&LD	Putnam	Illinois River	2,612	50	Unacceptable	11/19/2001
Pekin and La Marsch D&LD	Peoria	Illinois River	2,843	50	Inactive	Not Available
Degognia \ Grand Tower	Jackson	Mississippi River	56,777	50	Unacceptable	7/14/2010
Mason and Menard D&LD	Mason	Sangamon River	5,885	50	Inactive	Not Available
Streator, IL Levee	La Salle	Vermilion River	27	50	Unacceptable	10/21/2008
Page Park Dam North Branch	Winnebago	Kent Creek	751	50	Inactive	Not Available
Cincinnati L&DD	Tazewell	Mackinaw	2,004	10	Inactive	Not Available

XIX. Estimation of Flood Exposure, Losses, and Vulnerability

For this study, we evaluated the flood exposure, losses, and vulnerability for the State of Illinois at county and jurisdictional scales in order to inform mitigation activities. The estimates of flood exposure and losses presented here are in 2006 dollars.

XX. Exposure

The building-related-flood exposure within the 100-year floodplain in Illinois is estimated to be $190.25 billion. The greatest concentration of this flood exposure is located in Cook and adjacent five counties: Dupage, Kane, Lake, McHenry and Will. These counties contain $120.92 billion or nearly 64% of the 100-year flood exposure in Illinois (Figure 3; Appendix B and C). Correspondingly, the cities within these counties generally had the largest estimate jurisdictional flood exposure. Nine out of the top ten jurisdictions with the largest estimate flood exposure are located within these six counties (Figure 4; Appendix D).

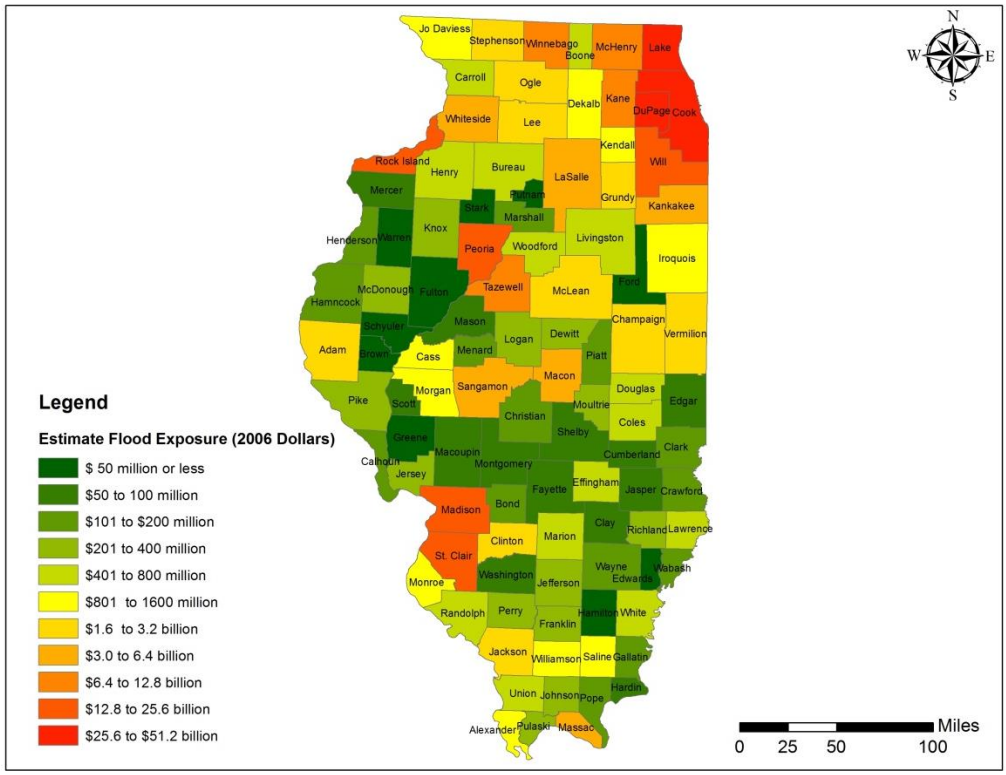

Figure 3 - Estimated flood exposure on 100-year floodplains aggregated by county

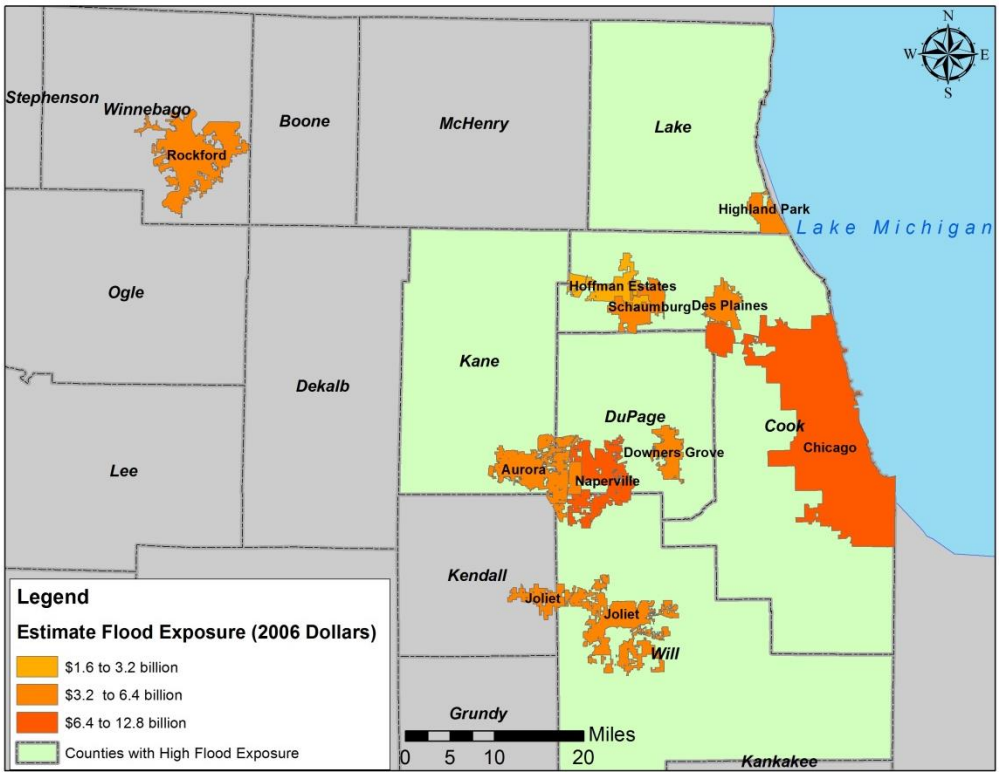

Figure 4 - Top ten jurisdictions in Illinois with highest absolute values of flood exposure on the 100-year floodplains.

This analysis estimated there to be $22.3 billion in building-related infrastructure in Illinois behind levees accredited by FEMA as protecting the 100-year level or higher. The majority of this exposure (85%) is located within three counties along the Mississippi River: Madison County ($13.42 billion in exposure), Rock Island County ($3.84 billion), and St. Clair ($1.71 billion; Figure 5; Appendices C, D, and E).

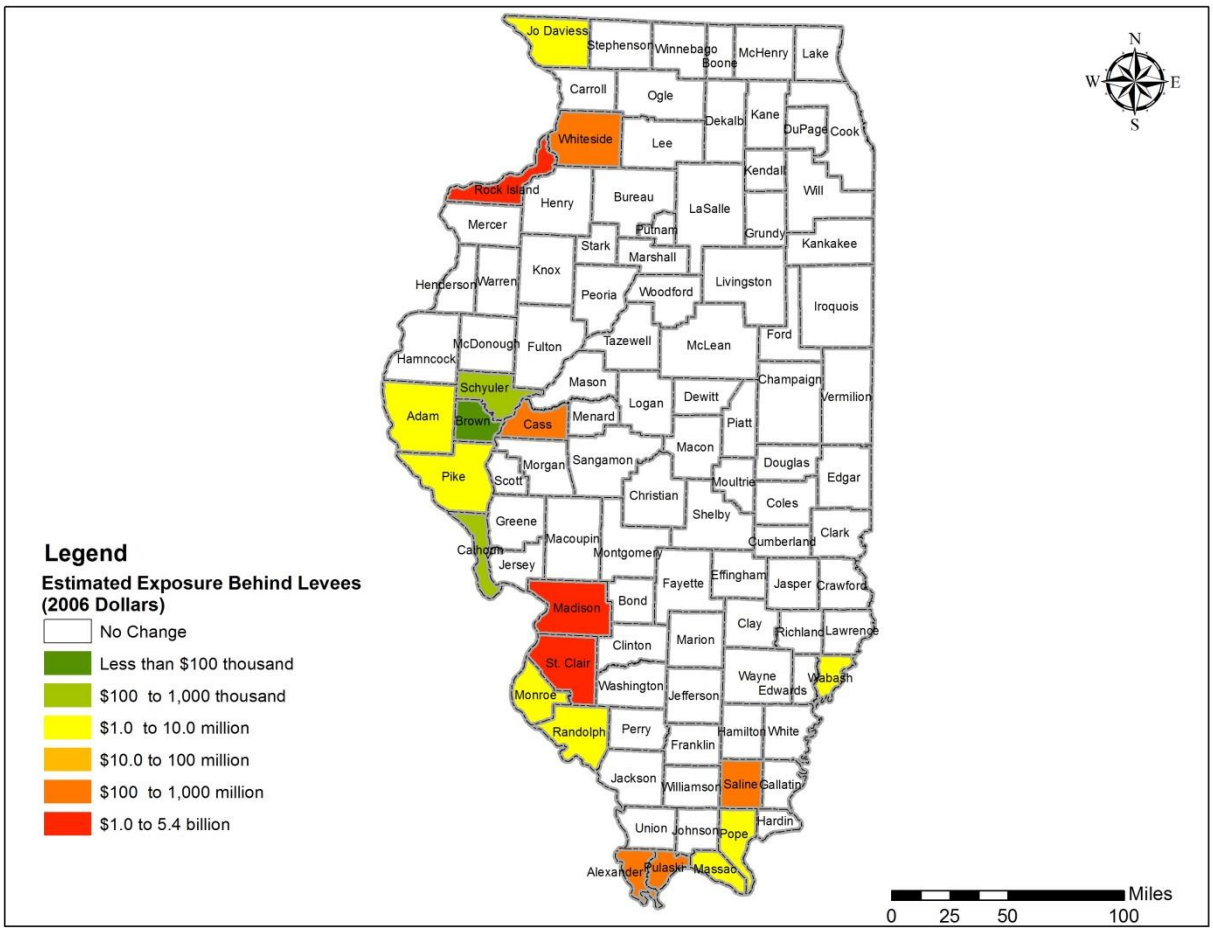

Figure 5 - Estimated flood exposure in levee-protected areas by county.

XXI. Flood Losses

Flood losses were estimated for 100-year floodplains throughout the State of Illinois. For counties and jurisdictions which had FEMA-accredited levees (≥ 100-year protection level), we also estimated losses for a "levee fails scenario" in which, in addition to floodwaters inundation of unprotected floodplain, inundation and damages were also modeled for levee-protected areas.

Assuming the all the FEMA-accredited levees perform as designed (i.e., no levee failure[s]) the estimated building-related-flood losses on 100-year Illinois floodplains of are $18.03 billion. Aggregated county-level losses ranged from a minimum of $2.39 million in Ford County up to $3.27 billion in Cook County (Figure 6). At the jurisdictional level, flood losses ranged from less than a $1,000 in Bondville up to $950 million in the City of Chicago (Appendix D). As with the flood exposure estimates, the largest flood losses generally were in and around the City of Chicago.

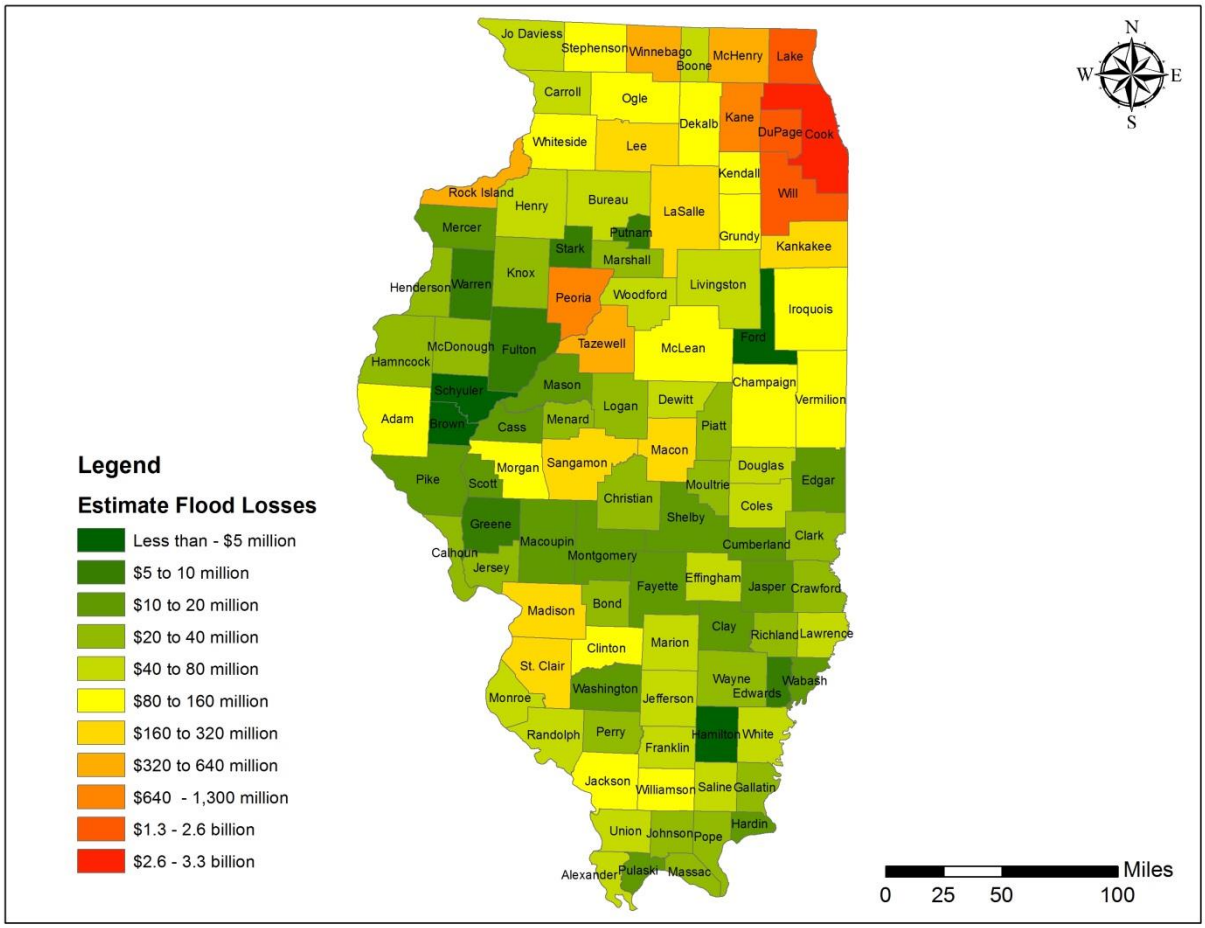

Figure 6- Estimated flood loss on the 100-year floodplain by county.

For the “levee fails scenario” the estimated building-related-flood losses on 100-year Illinois floodplains would increase from $18.03 billion to $21.44 billion (19%). The majority of the increase in flood losses (77%) is located in within three counties along the Mississippi River: Madison County ($1.1 billion increase in losses from $0.23 billion to $1.33 billion), St. Clair ($0.98 billion increase in losses from $0.20 billion to $1.18 billion), and Rock Island County ($0.58 billion increase from $0.34 billion to $0.92 billion; Appendices C, D, and E).

XXII. Flood-Loss Ratio

Flood-loss ratios were calculated in order to normalize losses to total building infrastructure exposure for different jurisdictions. This was done to provide an assessment of the relative impact of flood losses for jurisdictions of different sizes and total quantities of at-risk infrastructure. The average county flood-loss ratio was 0.10, the maximum county flood-loss ratio was 0.3 and the minimum was 0.02 (Figure 7; Appendix B). The average floodplain area weighted jurisdictional flood-loss ratio is 0.01, the maximum is 0.25, and the minimum is 0.00 (Figure 8; Appendix D). Flood-loss ratios for the jurisdictional analysis were weighted according to amount of floodplain area within the jurisdiction to correct for the overlap of census block outside of a jurisdiction's boundary (see Flood Vulnerability in the methods).

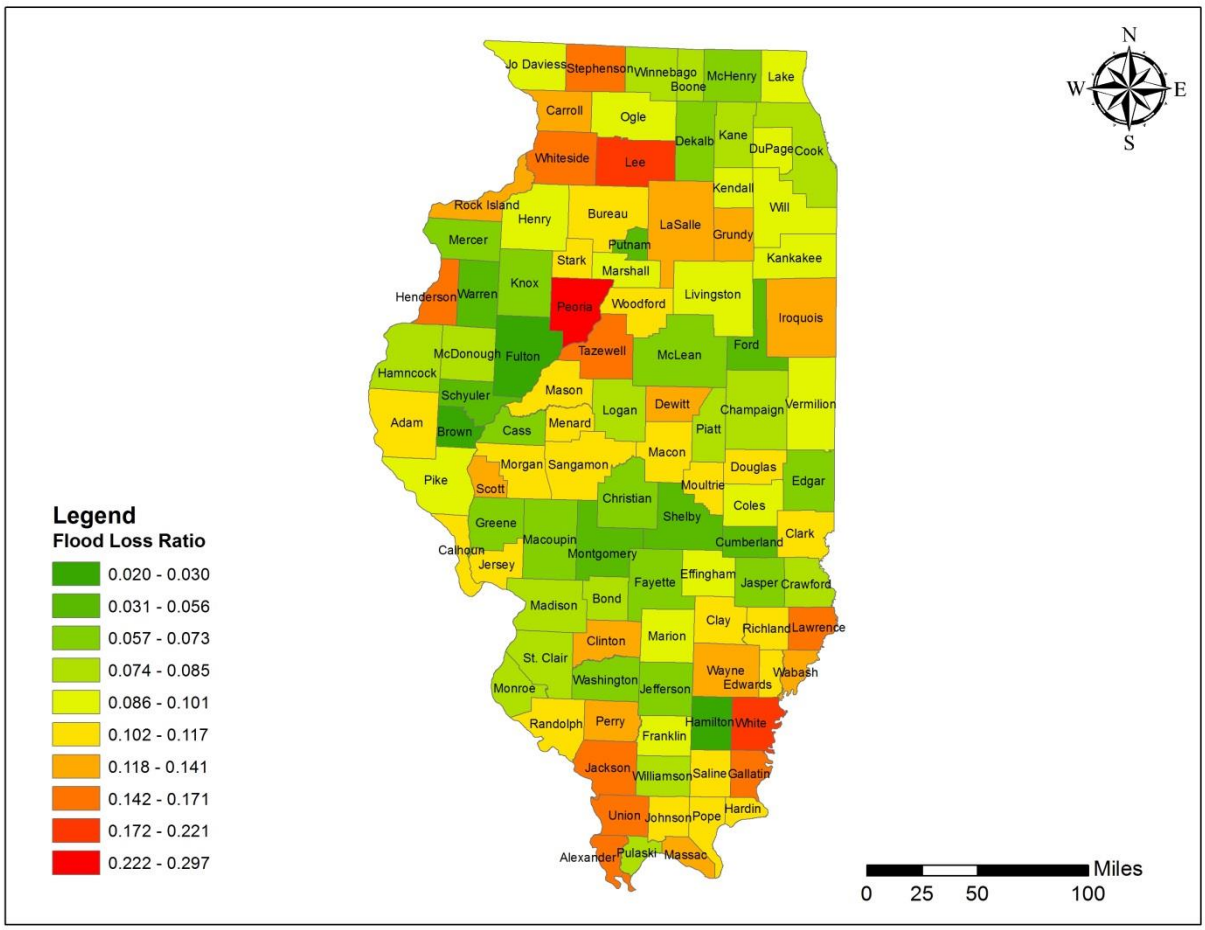

Figure 7 – County flood-loss ratios; values shown are a ratio estimated flood losses in each county's 100-year floodplain relative to total building-related exposure in the floodplain.

As Figures 7 and 8 show, the flood-loss ratio provides a different perspective on flood risk than flood-exposure and -loss maps. When normalized to total exposure, Cook and surrounding counties have average (0.1) to slightly below average ratios. The counties with the largest flood-loss ratios are Lee,

Peoria, Tazewell, White, and Lawrence Counties (Figure 7). These counties have large expanses of floodplain along larger rivers such as the Rock, Green, Illinois and Wabash. Jurisdictions with higher flood-loss ratios tend to be small and relatively less protected river towns such as Gulfport, Naples, Grand Tower, Old Shawneetown and Liverpool (Figure 8; Appendix D).

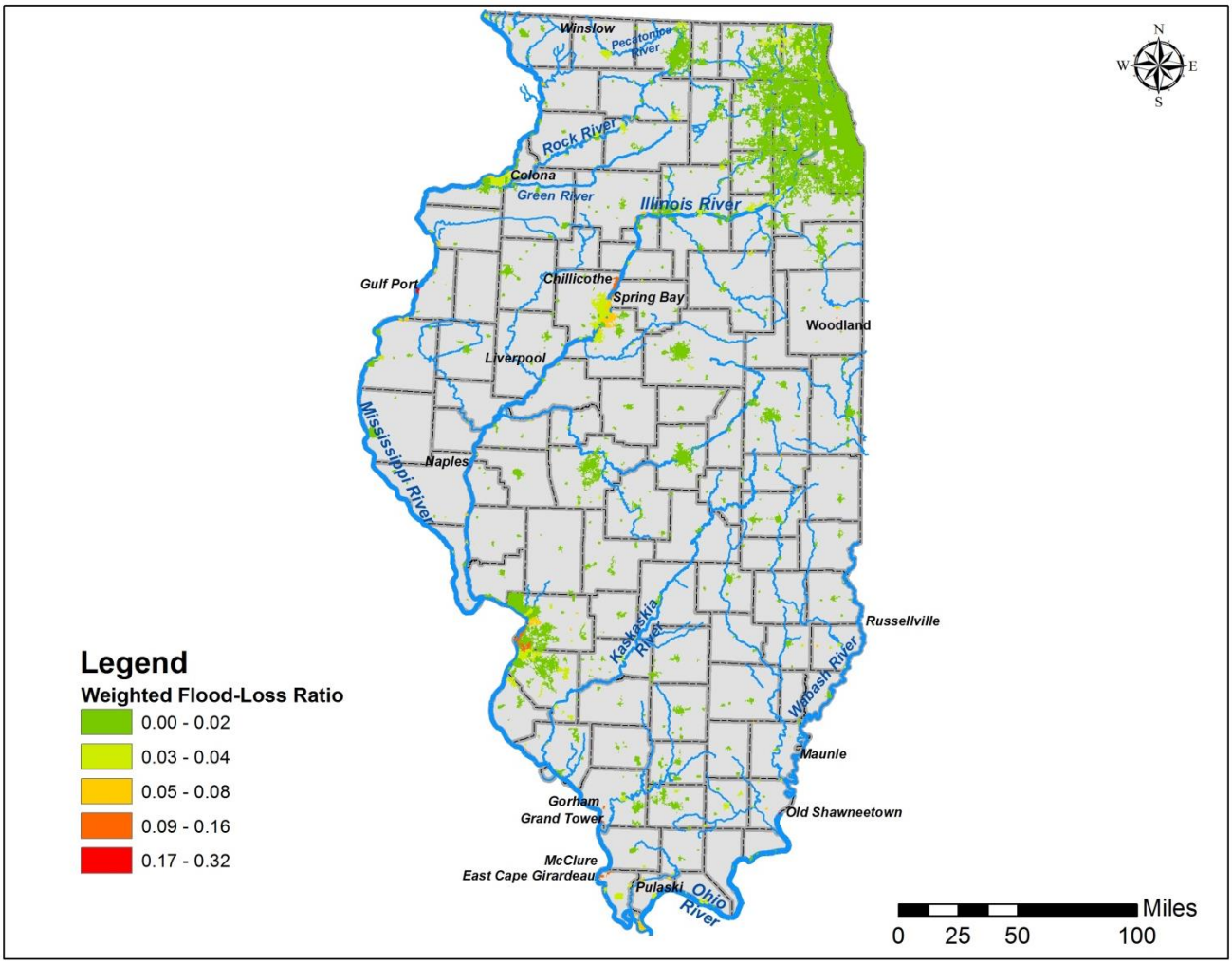

Figure 8 – Jurisdictional floodplain area weighted flood-loss ratios; jurisdictions with a loss ratio greater than 0.09 are labeled. Values shown are a ratio estimated flood losses in each jurisdiction's 100-year floodplain relative to total building-related exposure in the floodplain.

XXIII. Flood Vulnerability

Vulnerability to flooding was assessed in this study by calculating a Flood Vulnerability Index (FVI) that combines Hazus-based estimates of flood exposure and loss with the widely utilized Social Vulnerability Index (SoVI; HVRI, 2012). The county-level FVI scores ranged from 0.00 to 1.49 with an average of 0.48 (Figure 9; Appendix B). The modeling results suggest the least flood vulnerably county is Kendall County

and the most vulnerable county is Alexander County. By individual jurisdictions, the FVI scores ranged from 0.00 to 1.60 with a mean of 0.54. These results suggest that Boulder Hill is one of the least flood vulnerable jurisdictions in Illinois that contains a FEMA Special Flood Hazard Area (100-year floodplain) and Gulfport, IL is the most flood-vulnerable jurisdiction (Figure 10; Appendix D). The ten most vulnerable jurisdictions in Illinois are listed in Table 5.

The highest vulnerability scores (FVI) and vulnerability ratings are generally in the rural counties and communities located along Illinois's larger rivers. The greatest concentration of jurisdictions with high vulnerability rating is in the portions of southern Illinois bordering the Mississippi and Ohio Rivers. The other jurisdictions with high flood vulnerability ratings were located along other major rivers such as the Green, Illinois, Kaskaskia, and Rock Rivers (Figures 9 and 10).

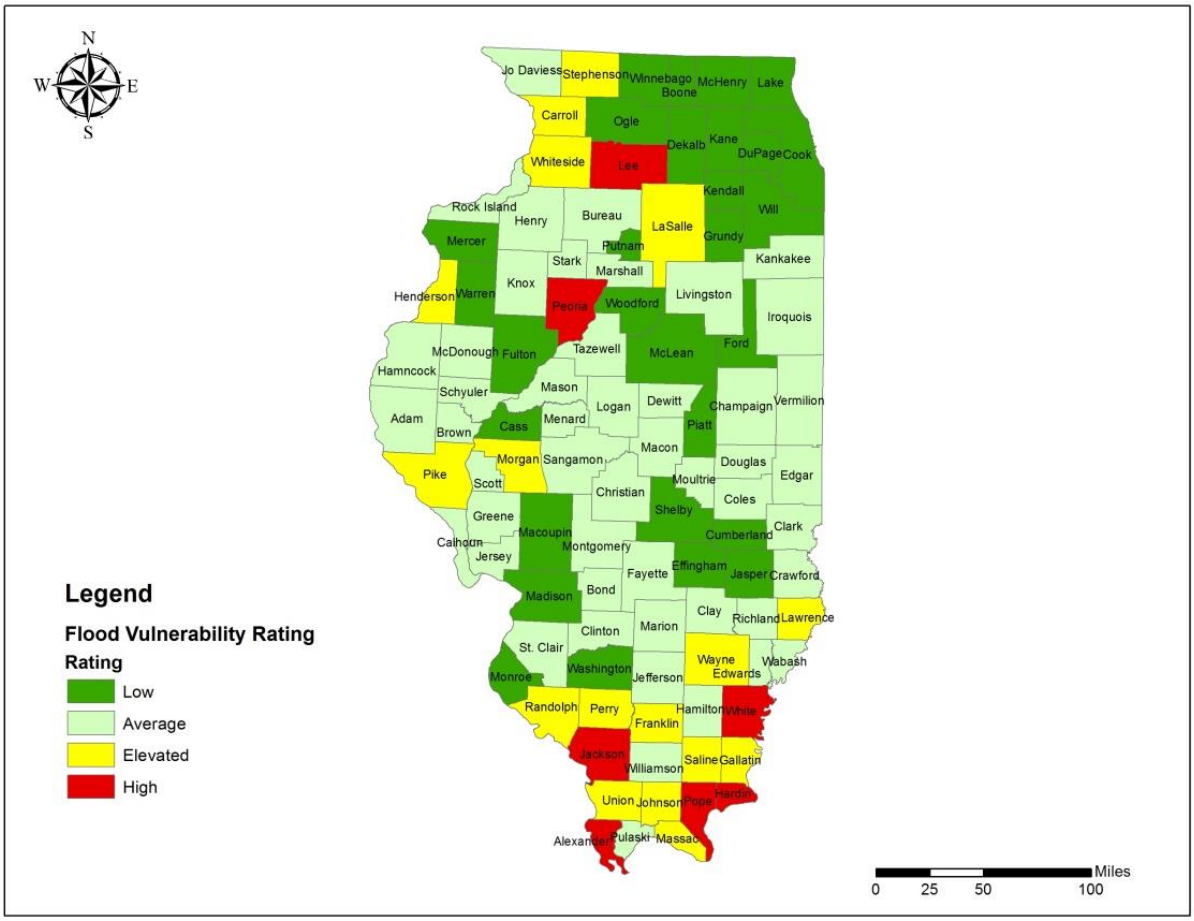

Figure 9 - Flood vulnerability ratings for the 102 counties in Illinois. These vulnerability ratings are categorical representations (low, average, elevated, or high) of the flood vulnerability index (FVI; see text).

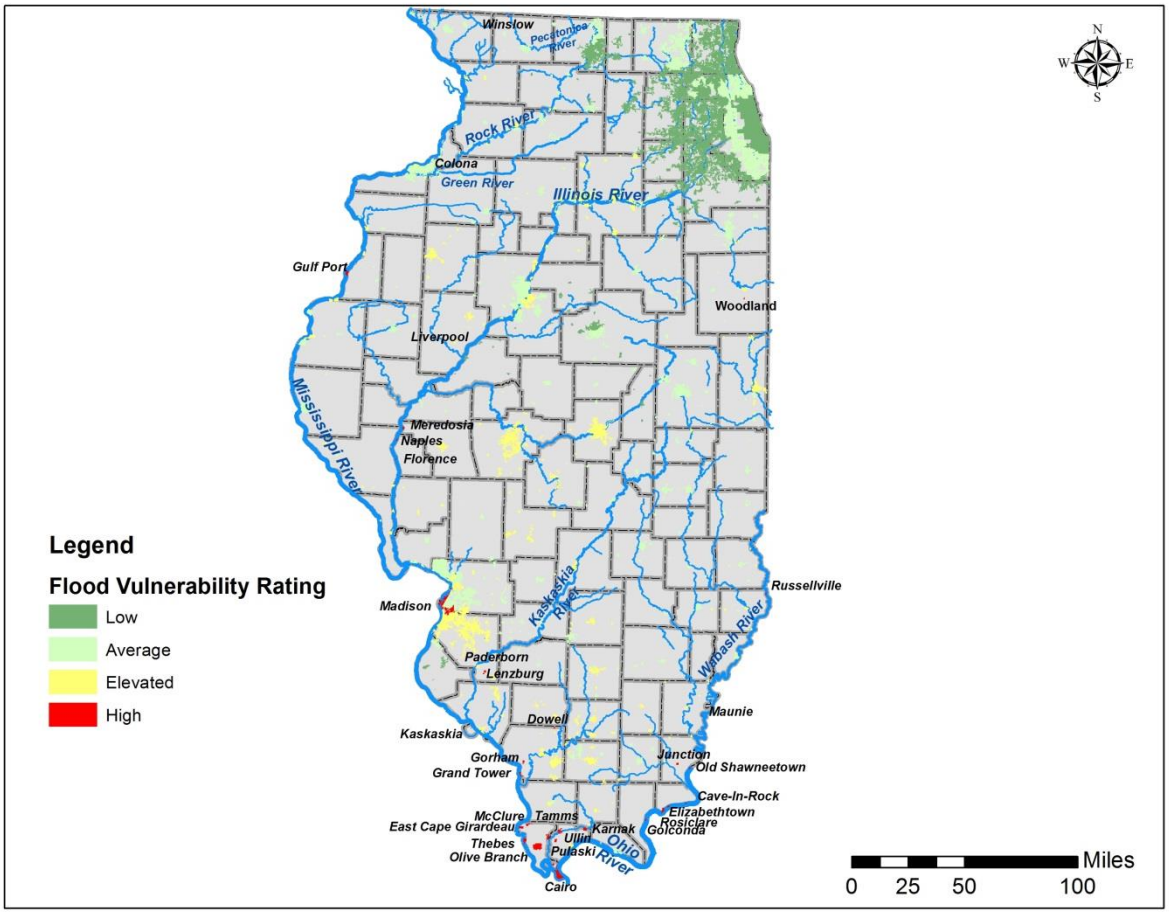

Figure 10 – The flood vulnerability rating for the 891 Illinois jurisdictions with a FEMA Special Flood Hazard Area (100-year floodplain). The high flood vulnerability jurisdictions are labeled.

Table 5 - The ten jurisdictions in Illinois most vulnerable to flooding

Town/City	Rank	Total Losses ($1000)	Total Exposure ($1000)	Loss Index	SoVI Index	Flood Score	Flood Vulnerability Index	Flood Vulnerability Rating
Gulf Port	1	6,135	23,775	1.000	0.606	1.606	1.000	High
East Cape Girardeau	2	6,213	43,849	0.560	1.000	1.560	0.971	High
Naples	3	3,618	15,753	0.886	0.587	1.472	0.917	High
Grand Tower	4	11,332	56,161	0.722	0.743	1.465	0.912	High
Old Shawneetown	5	3,913	22,190	0.697	0.722	1.419	0.883	High
McClure	6	3,820	27,457	0.550	0.823	1.372	0.854	High
Liverpool	7	3,593	21,226	0.669	0.682	1.350	0.841	High
Maunie	8	1,696	11,862	0.565	0.785	1.350	0.840	High
Gorham	9	3,098	20,789	0.499	0.743	1.242	0.773	High
Cairo	10	27,391	243,913	0.307	0.867	1.174	0.731	High

XXIV. State Essential and Critical Facilities Flood Loss Assessment

Using IEMA's statewide essential and critical facility database, five state-owned essential or critical facilities were identified within FEMA-mapped 100-year floodplains. A Hazus-MH user defined flood loss analysis was performed on each of these facilities to assess the flood exposure and potential flood losses if each of these facilities were to experience a 100-year flood. The estimated flood exposure for these five facilities (total estimated replacement value of structure and content) is $44.75 million. The total estimated flood losses if these structures were inundated to the 100-year flood level is $24.26 million. Table 6 shows the exposure and losses estimates for each of these five facilities.

Table 6 – Flood exposures and estimated flood losses for Illinois state-owned essential and critical facilities within the 100-year floodplain.

County	Facility Name	Replacement Cost ($1000s)	Estimated Content ($1000s)	Full Replacement Cost ($1000)	Total Losses ($1000)
Madison	Illinois Department of Transportation District 8 Headquarters	$ 10,674	$ 10,674	$ 21,349	$ 9,814
Madison	Illinois State Police - District 11	$ 1,832	$ 2,749	$ 4,581	$ 2,984
Madison	Illinois State Police / Office Building	$ 1,832	$ 2,749	$ 4,581	$ 2,201
Saline	Saline USDA Office	$ 1,180	$ 1,180	$ 2,360	$ 2,223
Jersey	Grafton Juvenile Correction Center	$ 7,916	$ 3,958	$ 11,874	$ 7,045
	Total			**$ 44,745**	**$ 24,268**

XXV. Other Critical and Essential Facilities

We used our statewide essential and critical facility to identify additional non-state-owned at-risk facilities. Four hundred essential or critical facilities were identified on 100-year floodplains. Of these 400 facilities, 8 were medical care facilities (hospitals, nursing homes and clinics), 48 were fire stations, 26 were police stations, 95 were schools, 25 were communication facilities, 10 were power facilities, 3 were natural gas facilities, 6 were oil facilities, 33 were potable water treatment facilities and 146 were waste water facilities. These 400 essential or critical facilities were located in 78 of the 102 Illinois counties. The top five counties with the greatest number of at risk essential or critical facilities were Madison County (31 facilities), Cook (30), La Salle (18), Will (17), and Jackson County (15). Appendix F lists all the essential and critical facilities on Illinois 100-year floodplains.

XXVI. Discussion and Conclusions

XXVII. Sources of Uncertainty

Rigorous and quantitative analysis requires identification of methodological assumptions and sources of uncertainty. In this study, sources of uncertainty were associated with the flood-exposure methods, with the loss estimation, with the social vulnerability parameters, and with the essential and critical facilities data. In addition, the results here should be interpreted in the context of the methods by which they were generated.

Uncertainty in Flood Exposure and Loss Estimates

The primary sources of uncertainty in the Hazus-MH flood -exposure and -loss estimates are (1) the use of the national-level infrastructure data for the building inventory and (2) the assumption of an even distribution of inventory across each census block. National-level infrastructure data provided with Hazus-MH are coarse approximations of structure, contents, and inventory values for a specific county or jurisdiction. The Hazus-MH infrastructure data inventory is provided at the census-block level instead of actual locations of individual buildings. The aggregate analysis in Hazus-MH involves the assumption that buildings are evenly distributed throughout each census block. In Illinois, previous research has shown that building-related loss estimates can average up to 50% greater than loss estimates using individual structure data with assessed values (Remo et al., 2012). Hence, the flood- exposure and -loss values presented here should be viewed as coarse estimates useful for comparative purposes.

Uncertainty in Social Vulnerability Parameters

The SoVI scores used in the flood vulnerability analysis here were estimated for each county. We used the county-level SoVI scores in the jurisdictional analysis because they were the highest resolution SoVI data available. The use of county-level SoVI data limits the resolution of the vulnerability results presented in this study, however these SoVI score were useful for assessing relative differences in flood vulnerability across Illinois, in particular comparisons between counties.

Uncertainty in Essential and Critical Facilities Data

Flood-vulnerable essential and critical facilities was screened using the best publicly available data. Due to the nature of these data, it is likely that there were some omissions, misidentifications and some of the facilities identified may not currently be in operation. However, all of the 400 essential and critical facilities identified as at-risk were checked to ensure the facility was located within the floodplain. These facilities were not individually checked for flood-proofing measures.

XXVIII. Major Findings

FEMA-mapped 100-year floodplains in Illinois encompass 7,140 mi^2, or 13% of the State. Within these floodplains, the estimated building-related flood exposure is $190 billion. Sixty-four percent ($121 billion) of Illinois's building-related-flood exposure is contained within the six counties which include and surround the city of Chicago (Figure 2). The building related-flood losses within the 100-year floodplain are estimated to be $18.39 billion dollars. Again the majority of these losses (~$10.18 billion of 55%) are located in and around Chicago. We underscore here again these exposure and loss estimates represent building-related exposure and losses only. These estimates do not take in account damage to infrastructure (i.e., roads, bridges, utilities, etc.), agriculture (i.e., crop damage) or secondary losses. In addition, all exposure and loss estimates are presented in $2006 dollars which is the unit currently used in the Hazus-MH infrastructure database.

Unlike flood exposure and losses, which are concentrated in the urban and suburban areas around Chicago, the most flood-vulnerable communities in Illinois are rural jurisdictions located along Illinois's larger rivers. The vulnerability analysis suggests that urban and suburban communities would tend to be more resilient (i.e., more resources available for recovery from significant flood losses) then rural river communities, despite the larger absolute flood losses in the urban areas. The greatest concentration of jurisdictions with high flood vulnerability indices were in southern Illinois counties bordering the Mississippi and Ohio Rivers (Figures 9 and10).

We identified 405 essential or critical facilities located on the 100-year floodplains in Illinois. Of these, only 5 were state-owned facilities (Table 6), together they comprised $44.75 million in flood exposure and $24.27 million in estimated flood losses. The remaining 400 essential or critical facilities were owned by local governments, private companies, or not-for-profit groups. The majority of at-risk essential facilities were schools (95 facilities statewide), fire stations (48), and police stations (26). The majority of the critical facilities at risk were waste-water treatment (146), potable-water treatment (33), and communication facilities (25).

Flood risk on levee-protected floodplains, in Illinois and elsewhere, is a distinct hazard with distinct issues and concerns. Of the 143 levee systems we identified in Illinois, the majority (124) participate or are eligible for the USACE's Public Law 84-99 program, involving regular levee inspections and resources for levee repair following flood damage. We estimate that the 143 levee systems provide flood protection to $25.01 billion in building infrastructure on Illinois 100-year floodplains. It should be noted, however, that recent levee inspections by the USACE have found significant deficiencies in 108 (87%) of these levee systems and 28 (23%) of these levees were rated by the USACE as "unacceptable" or "inactive" (see Floodplains and Levees section of this report).

Three levee-protected areas in Illinois are of particular concern: 1) Metro East, 2) East Peoria, and 3) Rock Island. Failure of any of the levees which protect these areas would likely result is a significant loss of property and, potentially, life. Of greatest concern is the Metro East Sanitary District levee system. This is an urban levee constructed to the 500-year protection level which protects 20 communities with a total population of ~120,000 people against inundation from the Mississippi River. This levee system has been rated unacceptable by the USACE, which means that the levee may not perform to its designed

level during a major flood. The analysis here identified $15.13 billion of dollars building-related infrastructure protected by the Metro East levee system. This study estimated that there would be nearly $3.0 billion of building-related-flood losses if the levee was to fail and flood waters inundate the levee cell to the 100-year level.

In East Peoria there are seven levee systems along the Illinois River, protecting ~2,000 people, which were originally designed to protect up to 100-year flood level. These levees have been rated as unacceptable by the USACE, which means they may not perform to their design level during a major flood. These levees are estimated to contain $792 million in building-related infrastructure. This study estimated that there would be $207 million in building-related-flood losses if the levees were to fail and flood waters inundate the levee cell to the 100-year level.

In Rock Island County there are five levee systems, protecting approximately 11,200 people in portions of Rock Island, Moline, East Moline, and Milan from inundation by the Mississippi and/or Rock Rivers up to the 200-year flood level. These levees have been rated as “minimally acceptable” by the USACE during their last inspection, which means they would likely perform to their design level during a large flood. However, these levees protect the second largest concentration of floodplain infrastructure in Illinois. The estimated building-related infrastructure (i.e., exposure) protected by these levees is $2.62 billion. This study estimated that there would be $625 million in building-related-flood losses if these levees were to fail and flood waters inundate the levee cell to the 100-year level.

XXIX. References

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XXXI. Appendix A – Levee Information

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Carroll	Mississippi River	1993	7.8	3300	50	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Mississippi River	1984	12.0	9586	200	Yes	Yes	Minimally Acceptable	4/22/2010	Periodic
Whiteside	Mississippi River	1977	3.4	10044	100	Yes	Yes	Minimally Acceptable	3/12/2012	Periodic
Whiteside	Rock River	Not Available	0.4	100	20	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	Not Available	7.6	5800	10	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	Not Available	1.7	770	5	No	No	Not Applicable	Not Applicable	N/A
Whiteside	Rock River	1940	9.2	9495	50	Yes	No	Unacceptable	4/3/2012	Routine
Rock Island	Rock River	Not Available	7.6	5007	50	Yes	No	Inactive	4/21/2011	Routine
Rock Island	Mississippi River	1984	2.5	1193	200	Yes	Yes	Minimally Acceptable	5/13/2010	Periodic
Rock Island	Mississippi River	Not Available	0.9	822	Not Available	No	No	Not Applicable	Not Applicable	N/A
Rock Island	Mississippi River	1973	3.8	863	200	Yes	Yes	Minimally Acceptable	5/11/2010	Periodic
Rock Island	Rock River	1988	10.8	1147	200	Yes	Yes	Minimally Acceptable	4/2/2012	Periodic
Rock Island	Rock River	1988	10.8	811	200	Yes	Yes	Minimally Acceptable	4/2/2012	Periodic
Rock Island	Mississippi River	1969	1.6	63	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Rock Island	Mississippi River	1969	1.6	113	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Rock Island	Mississippi	1963	9.6	5110	50	Yes	No	Minimally	5/10/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Rock Island	River Mississippi River	1989	1.6	130	2	Yes	No	Acceptable Minimally Acceptable	Not Available	Not Available
Putnam	Illinois River	1940	5.9	2612	50	Yes	No	Unacceptable	11/19/2001	Routine
Mercer	Mississippi River	1966	19.9	24989	50	Yes	No	Minimally Acceptable	5/13/2010	Routine
Mercer	Mississippi River	1969	0.9	115	Not Available	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	Not Available	0.0	77	Not Available	No	No	Not Applicable	Not Applicable	N/A
WOODFORD	Illinois River	Not Available	1.6	420	10	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	1968	6.6	6163	Not Available	No	No	Not Applicable	Not Applicable	N/A
Henderson	Mississippi River	1968	11.3	17998	50	Yes	No	Not Available	Not Available	Not Available
Peoria	Illinois River	Not Available	1.0	125	10	No	No	Not Applicable	Not Applicable	N/A
Tazewell	Illinois River	1945	9.5	20	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	9.5	355	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	3.2	17	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	0.0	1049	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois River	1945	9.5	37	100	Yes	No	Unacceptable	4/11/2012	Periodic
Tazewell	Illinois	1945	9.5	93	100	Yes	No	Unacceptable	4/11/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Tazewell	River Illinois River	1945	9.5	94	100	Yes	No	Unacceptable	4/11/2012	Periodic
Peoria	Illinois River	Not Available	1.2	57	100	Yes	No	Minimally Acceptable	10/5/2007	Routine
Peoria	Illinois River	Not Available	2.6	245	10	No	No	Not Applicable	Not Applicable	N/A
Peoria	Illinois River	1954	7.1	2843	50	Yes	No	Inactive	Not Available	Not Available
Henderson	Mississippi River	Not Available	0.0	458	Not Available	No	No	Not Applicable	Not Applicable	N/A
Tazewell	Illinois River	1941	16.0	13010	50	Yes	No	Acceptable	Not Available	Not Available
Peoria	Illinois River	1941	10.8	4866	50	Yes	No	Inactive	Not Available	N/A
Fulton	Illinois River	1941	8.7	2961	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Illinois River	1941	7.0	3174	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Mason	Illinois River	1993	3.8	1192	10	No	No	Not Applicable	Not Available	N/A
Fulton	Illinois River	1920	12.3	5911	50	Yes	No	Acceptable	Not Available	Not Available
Fulton	Illinois River	1949	4.5	10553	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Hancock	Mississippi River	1972	30.3	31406	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Illinois River	1939	4.7	1782	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Schuyler	Illinois	1943	6.8	3921	50	Yes	No	Unacceptable	5/12/2012	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Schuyler	River Illinois River	Not Available	4.8	1200	Not Available	No	No	Not Applicable	Not Applicable	N/A
Adams	Mississippi River	1971	29.0	12638	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Schuyler	Illinois River	1954	13.1	6318	100	Yes	Yes	Minimally Acceptable	5/8/2012	Periodic
Schuyler	Illinois River	1941	8.6	5559	50	Yes	No	Acceptable	12/15/2010	Routine
Cass	Illinois River	1967	11.1	21923	100	Yes	Yes	Minimally Acceptable	7/22/2010	Periodic
Adams	Mississippi River	1971	29.0	6859	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Morgan	Illinois River	Not Available	10.8	16119	30	Yes	No	Minimally Acceptable	6/15/2010	Periodic
Brown	Illinois River	Not Available	5.8	1646	12	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Brown	Illinois River	Not Available	14.6	12254	100	Yes	Yes	Minimally Acceptable	12/1/2007	Periodic
Adams	Mississippi River	Not Available	8.8	5515	500	Yes	Yes	Acceptable	Not Available	Not Available
Morgan	Illinois River	Not Available	7.0	9062	10	Yes	No	Minimally Acceptable	10/9/2010	Periodic
Pike	Mississippi River	1971	0.0	45261	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Scott	Illinois River	Not Available	6.4	5481	40	Yes	No	Minimally Acceptable	1/4/2011	Periodic
Pike	Illinois River	Not Available	8.2	4772	40	Yes	No	Minimally Acceptable	1/5/2011	Periodic
Scott	Illinois	Not	1.9	693	40	YES	No	Minimally	8/25/2011	Routine

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River	Available						Acceptable		
Scott	Illinois River	Not Available	17.0	11125	40	Yes	No	Minimally Acceptable	2/11/2011	Periodic
Pike	Mississippi River	1971		896	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Pike	Mississippi River	1971		17264	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Scott	Illinois River	Not Available	11.3	13607	20	Yes	No	Minimally Acceptable	8/26/2011	Routine
Pike	Mississippi River	1971		43296	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Greene	Illinois River	Not Available	12.8	13446	20	Yes	No	Minimally Acceptable	8/24/2011	Routine
Greene	Illinois River	Not Available	12.2	9795	20	Yes	No	Minimally Acceptable	10/2/2010	Periodic
CALHOUN	Mississippi River	1971		14037	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Greene	Illinois River	Not Available	12.4	9362	25	Yes	No	Minimally Acceptable	10/9/2010	Periodic
Greene	Illinois River	Not Available	11.8	9455	20	Yes	No	Minimally Acceptable	12/9/2010	Periodic
JERSEY	Illinois River	Not Available	12.3	11048	20	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Madison	Mississippi River	Not Available	20.8	428	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi River	Not Available	20.8	10688	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi River	Not Available	20.8	1640	500	Yes	Yes	Minimally Acceptable	8/30/2011	Periodic
Madison	Mississippi	Not	19.8	85977	500	Yes	Yes	Unacceptable	5/22/2010	Periodic

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Madison	River Mississippi River	Available Not Available	11.3	1999	10	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Madison	Mississippi River	Not Available	2.4	800	10	No	No	Not Applicable	Not Applicable	N/A
St. Clair	Mississippi River	Not Available	10.3	12903	500	Yes	Yes	Minimally Acceptable	10/9/2009	Periodic
Monroe	Mississippi River	Not Available	20.1	13806	50	Yes	No	Minimally Acceptable	1/30/2011	Periodic
Monroe	Mississippi River	Not Available	21.4	45938	50	Yes	No	Minimally Acceptable	11/2/2010	Periodic
Randolph	Mississippi River	Not Available	16.5	16151	100	Yes	Yes	Minimally Acceptable	11/3/2010	Periodic
Randolph	Mississippi River	Not Available	14.8	9241	50	Yes	No	Minimally Acceptable	8/12/2011	Routine
Jackson	Mississippi River	Not Available	19.4	56777	50	Yes	No	Unacceptable	7/14/2010	Periodic
Union	Mississippi River	Not Available	14.6	16200	50	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Fulton	Spoon River	1983	3.2	1290	50	Yes	No	Acceptable	3/24/2012	Routine
Fulton	Illinois and Spoon R	1930	5.5	1233	20	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Spoon River	Not Available	0.0	422	Not Available	Yes	No	Unacceptable	3/5/2009	Routine
Fulton	Spoon River	1955	6.1	2213	50	Yes	No	Minimally Acceptable	3/1/2011	Routine
Fulton	Spoon River	1954	3.7	980	10	Yes	No	Acceptable	3/7/2011	Routine
Mason	Sangamon	1939	14.5	5885	50	Yes	No	Inactive	Not	Not

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River								Available	Available
Menard	Sangamon River	1939	7.4	2729	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Menard	Sangamon River	Not Available	0.0	563	Not Available	Yes	No	Minimally Acceptable	1/13/2010	Routine
Mason	Sangamon River	1941	8.3	7448	50	Yes	No	Acceptable	Not Available	Not Available
Cass	Sangamon River	Not Available	0.0	4082	Not Available	Yes	No	Inactive	Not Available	N/A
Cass	Sangamon River	1895	8.0	2561	20	Yes	No	Minimally Acceptable	10/29/2009	Routine
Cass	Sangamon River	1975	6.1	3811	50	Yes	No	Minimally Acceptable	5/22/2009	Routine
Cass	Sangamon River	1948	8.5	13954	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Fulton	Spoon River	1960	2.4	290	10	Yes	No	Minimally Acceptable	3/14/2011	Routine
Stark	Spoon River	Not Available	0.7	152	10	Yes	No	Minimally Acceptable	10/31/2007	Routine
Fayette	Kaskaskia River	Not Available	0.0	1398	Not Available	Yes	No	Minimally Acceptable	5/26/2010	Periodic
Fayette	Kaskaskia River	Not Available	0.0	11978	Not Available	Yes	No	Not Available	Not Available	Not Available
Clinton	Kaskaskia River	Not Available	0.0	2932	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Kaskaskia River	Not Available	0.0	1277	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Kaskaskia River	Not Available	0.0	3443	Not Available	Yes	No	Minimally Acceptable	9/22/2011	Routine
Clinton	Shoal Creek	Not	0.0	1403	Not	Yes	No	Minimally	9/22/2011	Routine

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
		Available			Available			Acceptable		
St. Clair	Kaskaskia River	Not Available	0.0	146	100	Yes	Yes	Minimally Acceptable	9/14/2011	Periodic
Jasper	Embarrass River	Not Available	0.0	2078	Not Available	Yes	No	Minimally Acceptable	9/18/2007	Routine
Lawrence	Wabash River	Not Available	0.0	41385	Not Available	Yes	No	Minimally Acceptable	9/18/2007	Routine
Lawrence	Wabash River	Not Available	0.0	6157	Not Available	Yes	No	Minimally Acceptable	4/5/2012	Periodic
Wabash	Wabash River	Not Available	0.0	550	100	Yes	Yes	Minimally Acceptable	7/11/2012	Periodic
Wabash	Wabash River	Not Available	0.0	4823	Not Available	Yes	No	Minimally Acceptable	4/6/2012	Periodic
Gallatin	Ohio River	Not Available	0.0	945	100	Yes	No	Unacceptable	12/13/2005	Routine
Saline	Saline River	Not Available	0.0	3903	100	Yes	Yes	Minimally Acceptable	9/12/2012	Routine
Hardin	Ohio River	Not Available	0.0	263	100	Yes	Yes	Minimally Acceptable	2/6/2012	Periodic
Massac	Ohio River	Not Available	0.0	1185	100	Yes	Yes	Unacceptable	6/3/2010	Periodic
Massac	Bay Creek Ditch	Not Available	0.0	6655	50	Yes	No	Minimally Acceptable	2/7/2012	Routine
Pulaski	Cache River	Not Available	0.0	2147	Not Available	Yes	No	Unacceptable	4/22/2010	Periodic
Alexander	Mississippi River	Not Available	0.0	16605	15	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Alexander	Mississippi and Ohio	Not Available	0.0	16584	100	Yes	Yes	Unacceptable	4/16/2012	Routine
La Salle	Illinois	Not	0.0	63	Not	Yes	No	Acceptable	Not	Not

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
	River	Available			Available				Available	Available
La Salle	Vermilion River	Not Available	0.4	27	50	Yes	No	Unacceptable	10/21/2008	Routine
Winnebago	Kent Creek	Not Available	0.0	751	50	Yes	No	Inactive	Not Available	Not Available
Winnebago	South Branch Kent Creek	1988	0.0	3605	50	Yes	No	Minimally Acceptable	Not Available	Not Available
Winnebago	Kent Creek	Not Available	0.0	637	50	Yes	No	Acceptable	Not Available	Not Available
Winnebago	Keith Creek	Not Available	0.0	210	Not Available	Yes	No	Unacceptable	11/19/2003	Routine
Lake	Des Plaines River	Not Available	0.0	65	Not Available	Yes	No	Minimally Acceptable	4/26/2010	Periodic
DeKalb	Kishwaukee	1958	3.2	92	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
DeKalb	Kishwaukee	1958	3.2	183	100	Yes	Yes	Inactive	Not Available	Not Available
Peoria	Illinois River	Not Available	9.5	81	100	Yes	Yes	Unacceptable	4/11/2012	Periodic
Jo Daviess	Mississippi River	Not Available	0.0	40	Not Available	No	No	Not Applicable	Not Applicable	N/A
Joe Daviess	Galena River	1951	1.6	30	100	Yes	Yes	Minimally Acceptable	Not Available	Not Available
Joe Daviess	Galena River	1951	0.0	39	100	Yes	Yes	Not Available	Not Available	Not Available
Rock Island	Slough Mill Creek	Not Available	0.0	85	100	Yes	Yes	Not Available	Not Available	Not Available
Henderson	Mississippi	Not Available	0.0	686	Not Available	Yes	No	Not Available	Not Available	Not Available

County	River or Stream	Year Completed	Length (Miles)	Protected Area (Acres)	Protection Level (Years)	PL 84-99 Participation	FEMA Certified Levee	Inspection Rating	Inspection Date	Inspection Type
Pike	Mississippi	Not Available	0.0	2461	Not Available	Yes	No	Minimally Acceptable	3/17/2011	Periodic
Jersey	Illinois River	Not Available	0.0	931	Not Available	Yes	No	Minimally Acceptable	12/17/2010	Periodic
Greene	Illinois	Not Available	0.0	725	Not Available	Yes	No	Minimally Acceptable	12/1/2007	Not Available
Greene	Illinois	Not Available	0.0	275	Not Available	Yes	No	Acceptable	12/1/2007	Not Available
Morgan	Illinois	Not Available	0.0	1600	Not Available	Yes	No	Minimally Acceptable	11/2/2010	Periodic
Tazewell	Mackinaw	Not Available	4.6	2004	10	Yes	No	Inactive	Not Available	Routine
Tazewell	Mackinaw	Not Available	3.4	1639	100	Yes	Yes	Minimally Acceptable	12/7/2010	Routine
Pope	Ohio River	Not Available	0.0	74	100	Yes	Yes	Minimally Acceptable	2/8/2012	Routine

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XXXVII. Appendix B – County Flood -Exposure, -Loss, and -Vulnerability Results

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Alexander	1	54730	350565	0.16	0.49	4.75	1.00	1.49	1.00	2.7	High
Peoria	2	1007400	3391926	0.30	1.00	-1.56	0.47	1.47	0.98	2.6	High
White	3	70270	355209	0.20	0.64	2.19	0.78	1.43	0.95	2.4	High
Pope	4	21750	185248	0.12	0.35	4.11	0.95	1.30	0.84	1.9	High
Lee	5	161510	730949	0.22	0.73	-0.53	0.56	1.28	0.83	1.8	High
Hardin	6	12680	113683	0.11	0.33	3.91	0.93	1.26	0.81	1.7	High
Jackson	7	154400	998106	0.15	0.49	1.69	0.74	1.23	0.79	1.6	High
LaSalle	8	281280	2060057	0.14	0.42	1.92	0.76	1.18	0.75	1.4	Elevated
Gallatin	9	24840	169928	0.15	0.46	1.44	0.72	1.18	0.75	1.4	Elevated
Johnson	10	32240	275579	0.12	0.35	2.26	0.79	1.14	0.72	1.2	Elevated
Henderson	11	30510	184335	0.17	0.53	0.06	0.61	1.13	0.71	1.2	Elevated
Lawrence	12	56700	336329	0.17	0.54	-0.23	0.58	1.12	0.70	1.1	Elevated
Perry	13	35330	272062	0.13	0.40	1.32	0.71	1.11	0.69	1.1	Elevated
Union	14	70000	474138	0.15	0.46	0.53	0.65	1.11	0.69	1.1	Elevated
Whiteside	15	154200	947245	0.16	0.52	-0.4	0.57	1.08	0.67	1.0	Elevated
Saline	16	75220	673263	0.11	0.33	1.68	0.74	1.07	0.66	1.0	Elevated
Carroll	17	57950	409575	0.14	0.44	0.32	0.63	1.07	0.66	0.9	Elevated
Stephenson	18	129770	851978	0.15	0.48	-0.17	0.59	1.06	0.66	0.9	Elevated
Massac	19	38920	312129	0.12	0.38	0.87	0.67	1.05	0.65	0.9	Elevated
Franklin	20	40530	441770	0.09	0.26	2.24	0.79	1.05	0.64	0.8	Elevated
Wayne	21	23770	170222	0.14	0.43	-0.07	0.59	1.03	0.63	0.8	Elevated
Morgan	22	85850	792258	0.11	0.32	0.87	0.67	0.99	0.60	0.6	Elevated
Randolph	23	63950	597776	0.11	0.31	0.88	0.67	0.99	0.60	0.6	Elevated
Pike	24	14370	152930	0.09	0.27	1.43	0.72	0.99	0.60	0.6	Elevated
Rock Island	25	342530	2505693	0.14	0.42	-0.63	0.55	0.97	0.58	0.5	Average
Pulaski	26	14340	169434	0.08	0.23	1.59	0.73	0.97	0.58	0.5	Average
Marion	27	53940	572355	0.09	0.27	1.15	0.70	0.97	0.58	0.5	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Tazewell	28	454300	2661830	0.17	0.54	-2.25	0.41	0.96	0.57	0.5	Average
Wabash	29	15850	130800	0.12	0.36	-0.14	0.59	0.95	0.57	0.5	Average
Vermilion	30	123600	1243312	0.10	0.29	0.65	0.66	0.94	0.56	0.4	Average
Adam	31	110210	947578	0.12	0.35	-0.13	0.59	0.94	0.56	0.4	Average
Calhoun	32	27620	250702	0.11	0.33	0.09	0.61	0.93	0.55	0.4	Average
Dewitt	33	41170	302236	0.14	0.42	-1.07	0.51	0.93	0.55	0.4	Average
Mason	34	18420	166071	0.11	0.33	-0.02	0.60	0.93	0.55	0.4	Average
Richland	35	32620	302456	0.11	0.32	0.11	0.61	0.93	0.55	0.4	Average
Knox	36	37840	515381	0.07	0.19	1.54	0.73	0.92	0.54	0.3	Average
Iroquois	37	87070	700991	0.12	0.38	-0.65	0.55	0.92	0.54	0.3	Average
Clay	38	15870	141698	0.11	0.33	-0.25	0.58	0.91	0.54	0.3	Average
Macon	39	212940	1925620	0.11	0.33	-0.24	0.58	0.91	0.53	0.3	Average
Bureau	40	63980	574753	0.11	0.33	-0.4	0.57	0.90	0.52	0.2	Average
Moultrie	41	34240	327897	0.10	0.30	-0.12	0.59	0.90	0.52	0.2	Average
Brown	42	2600	112709	0.02	0.01	3.35	0.88	0.89	0.52	0.2	Average
Clark	43	21010	198880	0.11	0.31	-0.29	0.58	0.89	0.51	0.2	Average
Marshall	44	27760	273602	0.10	0.29	-0.34	0.57	0.87	0.50	0.1	Average
Williamson	45	97300	1142675	0.09	0.23	0.33	0.63	0.86	0.50	0.1	Average
Clinton	46	125260	962267	0.13	0.40	-1.64	0.46	0.86	0.49	0.1	Average
Edwards	47	5670	49066	0.12	0.34	-1.09	0.51	0.85	0.49	0.1	Average
McDonough	48	33700	429648	0.08	0.21	0.44	0.64	0.85	0.49	0.0	Average
Scott	49	13410	104179	0.13	0.39	-1.81	0.45	0.84	0.48	0.0	Average
Schuyler	50	3070	54524	0.06	0.13	1.29	0.71	0.84	0.48	0.0	Average
Coles	51	63890	648722	0.10	0.28	-0.6	0.55	0.83	0.47	0.0	Average
Greene	52	9120	136790	0.07	0.17	0.75	0.66	0.83	0.47	0.0	Average
Jefferson	53	40080	580847	0.07	0.18	0.61	0.65	0.83	0.47	-0.1	Average
Stark	54	8350	80955	0.10	0.30	-0.92	0.52	0.82	0.46	-0.1	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Logan	55	33330	413402	0.08	0.22	-0.06	0.60	0.81	0.46	-0.1	Average
Christian	56	26400	375896	0.07	0.18	0.35	0.63	0.81	0.46	-0.1	Average
Fayette	57	16670	253200	0.07	0.17	0.53	0.65	0.81	0.45	-0.1	Average
Livingston	58	74040	819864	0.09	0.25	-0.53	0.56	0.81	0.45	-0.1	Average
Douglas	59	50080	470359	0.11	0.31	-1.27	0.49	0.81	0.45	-0.1	Average
Montgomery	60	11950	252162	0.05	0.10	1.23	0.70	0.80	0.45	-0.2	Average
Crawford	61	21050	284808	0.07	0.19	0.09	0.61	0.80	0.45	-0.2	Average
Jo Daviess	62	75040	795935	0.09	0.27	-0.93	0.52	0.79	0.44	-0.2	Average
Jersey	63	36090	328308	0.11	0.32	-1.71	0.46	0.78	0.43	-0.2	Average
Kankakee	64	198930	2071666	0.10	0.27	-1.23	0.50	0.77	0.42	-0.3	Average
Hamncock	65	28950	379773	0.08	0.20	-0.38	0.57	0.77	0.42	-0.3	Average
Sangamon	66	309090	2685773	0.12	0.34	-2.12	0.42	0.77	0.42	-0.3	Average
Edgar	67	11570	184342	0.06	0.15	0.09	0.61	0.76	0.42	-0.3	Average
Hamilton	68	4030	135221	0.03	0.03	1.32	0.71	0.75	0.40	-0.4	Average
Henry	69	57330	614438	0.09	0.26	-1.59	0.47	0.73	0.39	-0.5	Average
Menard	70	22730	215605	0.11	0.31	-2.12	0.42	0.73	0.39	-0.5	Average
Bond	71	20510	267956	0.08	0.20	-0.95	0.52	0.72	0.39	-0.5	Average
Jasper	72	12540	173289	0.07	0.19	-0.9	0.53	0.71	0.38	-0.5	Average
Cook	73	3273790	43728088	0.07	0.20	-1.01	0.52	0.71	0.38	-0.5	Average
Shelby	74	13180	242679	0.05	0.12	-0.17	0.59	0.71	0.37	-0.5	Average
Winnebago	75	467060	5588832	0.08	0.23	-1.45	0.48	0.71	0.37	-0.5	Average
St.Clair	76	202020	2509109	0.08	0.22	-1.36	0.49	0.70	0.37	-0.6	Low
Cass	77	10230	162022	0.06	0.16	-0.63	0.55	0.70	0.37	-0.6	Low
Ogle	78	126530	1252250	0.10	0.29	-2.26	0.41	0.70	0.37	-0.6	Low
Macoupin	79	13700	215085	0.06	0.16	-0.72	0.54	0.70	0.36	-0.6	Low
Ford	80	2390	50666	0.05	0.10	-0.02	0.60	0.70	0.36	-0.6	Low
Warren	81	6680	141830	0.05	0.10	-0.04	0.60	0.69	0.36	-0.6	Low

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Effingham	82	55360	622949	0.09	0.25	-1.97	0.44	0.68	0.35	-0.7	Low
Fulton	83	9250	459592	0.02	0.00	0.96	0.68	0.68	0.35	-0.7	Low
Washington	84	14610	214510	0.07	0.17	-1.13	0.51	0.68	0.35	-0.7	Low
Champaign	85	151490	1960497	0.08	0.21	-1.7	0.46	0.66	0.34	-0.7	High
Mercer	86	15760	238450	0.07	0.17	-1.56	0.47	0.64	0.31	-0.8	Low
Grundy	87	121980	1008513	0.12	0.36	-3.96	0.27	0.63	0.31	-0.9	Low
Cumberland	88	10390	205235	0.05	0.11	-1.05	0.51	0.62	0.30	-0.9	Low
Madison	89	225880	2960648	0.08	0.20	-2.23	0.41	0.62	0.30	-0.9	Low
Woodford	90	61660	579495	0.11	0.31	-3.65	0.29	0.61	0.29	-1.0	Low
Piatt	91	30900	368835	0.08	0.23	-2.7	0.37	0.60	0.29	-1.0	Low
Putnam	92	7350	136742	0.05	0.12	-2.23	0.41	0.53	0.23	-1.3	Low
Dekalb	93	103050	1494590	0.07	0.18	-3.01	0.35	0.52	0.23	-1.3	Low
Monroe	94	49310	612245	0.08	0.22	-3.83	0.28	0.50	0.20	-1.4	Low
McLean	95	131850	2137957	0.06	0.15	-3.7	0.29	0.44	0.16	-1.7	Low
Boone	96	61430	780967	0.08	0.21	-4.51	0.22	0.43	0.15	-1.7	Low
Kane	97	702320	8717526	0.08	0.22	-5.06	0.18	0.39	0.12	-1.8	Low
Will	98	1399440	15129593	0.09	0.26	-5.73	0.12	0.38	0.11	-1.9	Low
Lake	99	2090820	22539796	0.09	0.26	-6	0.10	0.36	0.09	-2.0	Low
DuPage	100	2199620	23666320	0.09	0.26	-6.36	0.07	0.33	0.07	-2.1	Low
McHenry	101	517800	7140216	0.07	0.19	-6.16	0.08	0.27	0.02	-2.3	Low
Kendall	102	104850	1199314	0.09	0.24	-7.15	0.00	0.24	0.00	-2.5	Low

XXXVIII. Appendix C – County Flood -Exposure, -Loss, and -Vulnerability Results for the Levees Fail Scenarios

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Alexander	1	106710	473539	0.23	0.74	4.75	1.00	1.74	3.38	High
Peoria	2	1007400	3391926	0.30	1.00	-1.56	0.47	1.47	2.32	High
White	3	70270	355209	0.20	0.64	2.19	0.78	1.42	2.14	High
Rock Island	4	920790	3607772	0.26	0.85	-0.63	0.55	1.40	2.05	High
Lee	5	161510	730949	0.22	0.73	-0.53	0.56	1.29	1.61	High
Hardin	6	12680	113683	0.11	0.33	3.91	0.93	1.26	1.51	High
Pulaski	7	45770	278678	0.16	0.52	1.59	0.73	1.25	1.47	Elevated
Pope	8	28030	274439	0.10	0.30	4.11	0.95	1.25	1.45	Elevated
Jackson	9	154400	998106	0.15	0.49	1.69	0.74	1.23	1.38	Elevated
Massac	10	59880	353205	0.17	0.54	0.87	0.67	1.21	1.31	Elevated
Cass	11	111560	551835	0.20	0.66	-0.63	0.55	1.21	1.30	Elevated
Whiteside	12	211780	1107594	0.19	0.62	-0.40	0.57	1.19	1.23	Elevated
LaSalle	13	281280	2060057	0.14	0.42	1.92	0.76	1.18	1.20	Elevated
Gallatin	14	24840	169928	0.15	0.46	1.44	0.72	1.18	1.18	Elevated
Saline	15	110930	833748	0.13	0.41	1.68	0.74	1.15	1.07	Elevated
Pike	16	32140	231988	0.14	0.43	1.43	0.72	1.15	1.07	Elevated
Johnson	17	32240	275579	0.12	0.35	2.26	0.79	1.14	1.04	Elevated
Henderson	18	30510	184335	0.17	0.53	0.06	0.61	1.14	1.02	Elevated
Lawrence	19	56700	336329	0.17	0.54	-0.23	0.58	1.12	0.95	Elevated
Union	20	70000	474138	0.15	0.46	0.53	0.65	1.11	0.93	Elevated
Perry	21	35330	272062	0.13	0.40	1.32	0.71	1.11	0.91	Elevated
Wabash	22	26040	169552	0.15	0.48	-0.14	0.59	1.07	0.78	Elevated
Carroll	23	57950	409575	0.14	0.44	0.32	0.63	1.07	0.76	Elevated
Stephenson	24	129770	851978	0.15	0.48	-0.17	0.59	1.07	0.76	Elevated
Franklin	25	40530	441770	0.09	0.26	2.24	0.79	1.05	0.69	Elevated
Adam	26	145230	993649	0.15	0.46	-0.13	0.59	1.05	0.67	Elevated
Randolph	27	76190	631635	0.12	0.36	0.88	0.67	1.03	0.63	Elevated
Wayne	28	23770	170222	0.14	0.43	-0.07	0.59	1.02	0.58	Elevated

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Morgan	29	85850	792258	0.11	0.32	0.87	0.67	0.99	0.45	Average
St.Clair	30	1184080	7511279	0.16	0.50	-1.36	0.49	0.99	0.45	Average
Marion	31	53940	572355	0.09	0.27	1.15	0.70	0.97	0.37	Average
Tazewell	32	454300	2661830	0.17	0.54	-2.25	0.41	0.95	0.32	Average
Vermilion	33	123700	1243312	0.10	0.29	0.65	0.66	0.95	0.29	Average
Calhoun	34	27730	252997	0.11	0.32	0.09	0.61	0.93	0.24	Average
Dewitt	35	41170	302236	0.14	0.42	-1.07	0.51	0.93	0.22	Average
Mason	36	18420	166071	0.11	0.33	-0.02	0.60	0.93	0.22	Average
Richland	37	32620	302456	0.11	0.32	0.11	0.61	0.93	0.21	Average
Iroquois	38	87070	700991	0.12	0.38	-0.65	0.55	0.93	0.21	Average
Knox	39	37840	515381	0.07	0.19	1.54	0.73	0.92	0.20	Average
Madison	40	1327770	8271525	0.16	0.51	-2.23	0.41	0.92	0.17	Average
Clay	41	15870	141698	0.11	0.33	-0.25	0.58	0.91	0.15	Average
Macon	42	212940	1925620	0.11	0.33	-0.24	0.58	0.91	0.13	Average
Bureau	43	63980	574753	0.11	0.33	-0.40	0.57	0.90	0.11	Average
Moultrie	44	34240	327897	0.10	0.30	-0.12	0.59	0.89	0.09	Average
Brown	45	2620	113197	0.02	0.01	3.35	0.88	0.89	0.07	Average
Clark	46	21010	198880	0.11	0.31	-0.29	0.58	0.89	0.06	Average
Jo Daviess	47	106020	868841	0.12	0.37	-0.93	0.52	0.89	0.06	Average
Kendall	102	104850	1199314	0.09	0.24	-7.15	0.00	0.24	-2.45	Low
Williamson	48	97300	1142675	0.09	0.23	0.33	0.63	0.86	-0.03	Average
Marshall	49	27760	273602	0.10	0.29	-0.34	0.57	0.86	-0.03	Average
Schuyler	50	3830	61423	0.06	0.15	1.29	0.71	0.86	-0.04	Average
Clinton	51	125260	962267	0.13	0.40	-1.64	0.46	0.86	-0.06	Average
Edwards	52	5670	49066	0.12	0.34	-1.09	0.51	0.85	-0.07	Average
McDonough	53	33700	429648	0.08	0.21	0.44	0.64	0.85	-0.08	Average
Scott	54	13410	104179	0.13	0.39	-1.81	0.45	0.84	-0.12	Average
Coles	55	63890	648722	0.10	0.28	-0.60	0.55	0.83	-0.15	Average

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Greene	56	9120	136790	0.07	0.17	0.75	0.66	0.83	-0.17	Average
Jefferson	57	40080	580847	0.07	0.18	0.61	0.65	0.83	-0.18	Average
Stark	58	8350	80955	0.10	0.30	-0.92	0.52	0.82	-0.20	Average
Logan	59	33330	413402	0.08	0.22	-0.06	0.60	0.82	-0.21	Average
Fayette	60	16670	253200	0.07	0.17	0.53	0.65	0.82	-0.22	Average
Livingston	61	74040	819864	0.09	0.25	-0.53	0.56	0.81	-0.23	Average
Christian	62	26400	375896	0.07	0.18	0.35	0.63	0.81	-0.24	Average
Crawford	63	21050	284808	0.07	0.19	0.09	0.61	0.80	-0.26	Average
Douglas	64	50080	470359	0.11	0.31	-1.27	0.49	0.80	-0.27	Average
Montgomery	65	11950	252162	0.05	0.10	1.23	0.70	0.80	-0.29	Average
Jersey	66	36090	328308	0.11	0.32	-1.71	0.46	0.78	-0.34	Average
Kankakee	67	198930	2071666	0.10	0.27	-1.23	0.50	0.77	-0.38	Average
Hamncock	68	28950	379773	0.08	0.20	-0.38	0.57	0.77	-0.39	Average
Edgar	69	11570	184342	0.06	0.15	0.09	0.61	0.76	-0.42	Average
Sangamon	70	309090	2685773	0.12	0.34	-2.12	0.42	0.76	-0.42	Average
Hamilton	71	4030	135221	0.03	0.03	1.32	0.71	0.74	-0.49	Average
Henry	72	57330	614438	0.09	0.26	-1.59	0.47	0.73	-0.54	Average
Menard	73	22730	215605	0.11	0.31	-2.12	0.42	0.73	-0.56	Average
Bond	74	20510	267956	0.08	0.20	-0.95	0.52	0.72	-0.58	Average
Jasper	75	12540	173289	0.07	0.19	-0.90	0.53	0.72	-0.60	Low
Cook	76	3273790	43728088	0.07	0.20	-1.01	0.52	0.72	-0.60	Low
Shelby	77	13180	242679	0.05	0.12	-0.17	0.59	0.71	-0.62	Low
Winnebago	78	467060	5588832	0.08	0.23	-1.45	0.48	0.71	-0.63	Low
Ogle	79	126530	1252250	0.10	0.29	-2.26	0.41	0.70	-0.66	Low
Monroe	80	95220	701150	0.14	0.42	-3.83	0.28	0.70	-0.68	Low
Ford	81	2390	50666	0.05	0.10	-0.02	0.60	0.70	-0.68	Low
Warren	82	6680	141830	0.05	0.10	-0.04	0.60	0.70	-0.68	Low
Macoupin	83	13700	215085	0.06	0.16	-0.72	0.54	0.70	-0.68	Low

County	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	SVI Score	SVI Index	Flood Score	z-score	Flood Vulnerability Ratting
Effingham	84	55360	622949	0.09	0.25	-1.97	0.44	0.69	-0.72	Low
Washington	85	14610	214510	0.07	0.17	-1.13	0.51	0.68	-0.73	Low
Fulton	86	9250	459592	0.02	0.00	0.96	0.68	0.68	-0.75	Low
Champaign	87	151490	1960497	0.08	0.21	-1.70	0.46	0.67	-0.80	Low
Mercer	88	15760	238450	0.07	0.17	-1.56	0.47	0.64	-0.92	Low
Grundy	89	121980	1008513	0.12	0.36	-3.96	0.27	0.63	-0.93	Low
Cumberland	90	10390	205235	0.05	0.11	-1.05	0.51	0.62	-0.98	Low
Woodford	91	61660	579495	0.11	0.31	-3.65	0.29	0.60	-1.05	Low
Piatt	92	30900	368835	0.08	0.23	-2.70	0.37	0.60	-1.06	Low
Putnam	93	7350	136742	0.05	0.12	-2.23	0.41	0.53	-1.32	Low
Dekalb	94	103050	1494590	0.07	0.18	-3.01	0.35	0.53	-1.34	Low
McLean	95	131850	2137957	0.06	0.15	-3.70	0.29	0.44	-1.68	Low
Boone	96	61430	780967	0.08	0.21	-4.51	0.22	0.43	-1.71	Low
Kane	97	702320	8717526	0.08	0.22	-5.06	0.18	0.40	-1.84	Low
Will	98	1399440	15129593	0.09	0.26	-5.73	0.12	0.38	-1.91	Low
Lake	99	2090820	22539796	0.09	0.26	-6.00	0.10	0.36	-1.98	Low
DuPage	100	2199620	23666320	0.09	0.26	-6.36	0.07	0.33	-2.10	Low
McHenry	101	517800	7140216	0.07	0.19	-6.16	0.08	0.27	-2.34	Low

Appendix D – Jurisdictional Flood -Exposure, -Loss, and -Vulnerability Results

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Gulf Port	1	6135	23775	0.26	0.98	0.25	1.00	0.06	0.61	1.61	1.00	4.52	High
East Cape Girardeau	2	6213	43849	0.14	1.00	0.14	0.56	4.75	1.00	1.56	0.97	4.33	High
Naples	3	3618	15753	0.23	0.98	0.22	0.89	-0.17	0.59	1.47	0.92	3.96	High
Grand Tower	4	11332	56161	0.20	0.91	0.18	0.72	1.69	0.74	1.46	0.91	3.92	High
Old Shawneetown	5	3913	22190	0.18	1.00	0.18	0.70	1.44	0.72	1.42	0.88	3.73	High
McClure	6	3820	27457	0.14	1.00	0.14	0.55	2.64	0.82	1.37	0.85	3.53	High
Liverpool	7	3593	21226	0.17	1.00	0.17	0.67	0.96	0.68	1.35	0.84	3.44	High
Maunie	8	1696	11862	0.14	1.00	0.14	0.56	2.19	0.78	1.35	0.84	3.44	High
Gorham	9	3098	20789	0.15	0.85	0.13	0.50	1.69	0.74	1.24	0.77	2.98	High
Cairo	10	27391	243913	0.11	0.69	0.08	0.31	3.17	0.87	1.17	0.73	2.69	High
Pulaski	11	420	2587	0.16	0.63	0.10	0.41	1.59	0.73	1.14	0.71	2.55	High
Thebes	12	771	8033	0.10	0.36	0.03	0.14	4.75	1.00	1.14	0.71	2.53	High
Russellville	13	20470	146337	0.14	1.00	0.14	0.55	-0.23	0.58	1.13	0.71	2.52	High
Olive Branch	14	4211	57562	0.07	0.44	0.03	0.13	4.75	1.00	1.13	0.70	2.49	High
Tamms	15	4171	57130	0.07	0.32	0.02	0.09	4.75	1.00	1.09	0.68	2.35	High
Cleveland	16	11139	51684	0.22	0.67	0.15	0.57	-1.59	0.47	1.04	0.65	2.13	High
Florence	17	991	7369	0.13	0.57	0.08	0.30	1.43	0.72	1.02	0.64	2.06	High
Ullin	18	4175	32265	0.13	0.55	0.07	0.28	1.59	0.73	1.01	0.63	2.02	High
Meredosia	19	17859	143985	0.12	0.62	0.08	0.30	1.15	0.70	1.00	0.62	1.96	High
Woodland	20	6067	40743	0.15	0.77	0.11	0.45	-0.65	0.55	1.00	0.62	1.95	High
Dowell	21	2471	28515	0.09	0.74	0.06	0.25	1.69	0.74	0.99	0.62	1.93	High
Karnak	22	1191	15278	0.08	0.75	0.06	0.23	1.93	0.76	0.99	0.62	1.93	High
Madison	23	3339	26490	0.13	0.63	0.08	0.32	0.83	0.67	0.99	0.61	1.90	High
Winslow	24	9958	51870	0.19	0.50	0.10	0.38	-0.17	0.59	0.97	0.60	1.83	High
Cave-In-Rock	25	429	8232	0.05	0.19	0.01	0.04	3.91	0.93	0.97	0.60	1.82	High
Elizabethtown	26	747	20027	0.04	0.21	0.01	0.03	3.91	0.93	0.96	0.60	1.79	High

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Golconda	27	2507	29026	0.09	0.04	0.00	0.01	4.11	0.95	0.96	0.60	1.78	High
Rosiclare	28	1568	34550	0.05	0.16	0.01	0.03	3.91	0.93	0.96	0.60	1.77	High
Paderborn	29	1289	10483	0.12	0.37	0.05	0.18	1.68	0.74	0.92	0.57	1.63	High
Kaskaskia	30	121	1965	0.06	1.00	0.06	0.24	0.88	0.67	0.92	0.57	1.61	High
Junction	31	645	13116	0.05	0.97	0.05	0.19	1.44	0.72	0.91	0.57	1.57	Elevated
Lenzburg	32	303	5979	0.05	0.77	0.04	0.15	1.68	0.74	0.90	0.56	1.52	Elevated
Freeman Spur	33	1369	8439	0.16	0.29	0.05	0.18	1.29	0.71	0.89	0.56	1.50	Elevated
Mill Shoals	34	1112	10863	0.10	0.50	0.05	0.20	1.06	0.69	0.89	0.55	1.49	Elevated
New Haven	35	3122	27697	0.11	0.31	0.03	0.14	1.82	0.75	0.89	0.55	1.49	Elevated
Hamburg	36	6418	29396	0.22	0.32	0.07	0.27	0.09	0.61	0.88	0.55	1.45	Elevated
Kampsville	37	3993	27608	0.14	0.42	0.06	0.24	0.42	0.64	0.88	0.55	1.43	Elevated
Alhambra	38	451	5775	0.08	0.90	0.07	0.28	-0.02	0.60	0.88	0.55	1.43	Elevated
London Mills	39	2453	22097	0.11	0.38	0.04	0.17	1.25	0.71	0.87	0.54	1.42	Elevated
Murphysboro	40	50187	287549	0.17	0.18	0.03	0.12	1.69	0.74	0.87	0.54	1.39	Elevated
Belknap	41	193	6714	0.03	0.66	0.02	0.07	2.26	0.79	0.87	0.54	1.38	Elevated
North Utica	42	19198	138357	0.14	0.19	0.03	0.10	1.92	0.76	0.86	0.54	1.38	Elevated
Pearl	43	888	7680	0.12	0.37	0.04	0.17	1.09	0.69	0.86	0.54	1.37	Elevated
Omaha	44	795	7875	0.10	0.33	0.03	0.13	1.44	0.72	0.85	0.53	1.33	Elevated
Crossville	45	3157	50402	0.06	0.25	0.02	0.06	2.19	0.78	0.85	0.53	1.31	Elevated
Marine	46	408	6300	0.06	0.97	0.06	0.25	-0.02	0.60	0.85	0.53	1.30	Elevated
Orient	47	586	7259	0.08	0.18	0.01	0.06	2.24	0.79	0.85	0.53	1.30	Elevated
Evansville	48	3779	15645	0.24	0.18	0.04	0.17	0.88	0.67	0.85	0.53	1.30	Elevated
Lake Holiday	49	20805	194458	0.11	0.20	0.02	0.08	1.92	0.76	0.85	0.53	1.30	Elevated
Chillicothe	50	91798	370349	0.25	0.38	0.09	0.37	-1.56	0.47	0.84	0.52	1.29	Elevated
Scott AFB	51	14156	130321	0.11	0.24	0.03	0.10	1.68	0.74	0.84	0.52	1.29	Elevated
Mascoutah	52	19061	182499	0.10	0.23	0.02	0.10	1.68	0.74	0.84	0.52	1.27	Elevated
Simpson	53	1617	32054	0.05	0.22	0.01	0.04	2.26	0.79	0.83	0.52	1.25	Elevated

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Vienna	54	10688	94366	0.11	0.09	0.01	0.04	2.26	0.79	0.83	0.52	1.24	Elevated
Valley City	55	150	3369	0.04	0.63	0.03	0.11	1.43	0.72	0.83	0.52	1.24	Elevated
Rock Island Arsenal	56	13115	103193	0.13	0.56	0.07	0.28	-0.63	0.55	0.83	0.52	1.24	Elevated
West Frankfort	57	8497	129212	0.07	0.15	0.01	0.04	2.24	0.79	0.83	0.51	1.22	Elevated
Carmi	58	17456	213231	0.08	0.13	0.01	0.04	2.19	0.78	0.83	0.51	1.22	Elevated
Zeigler	59	3833	38619	0.10	0.09	0.01	0.04	2.24	0.79	0.83	0.51	1.21	Elevated
Royalton	60	723	13266	0.05	0.15	0.01	0.03	2.24	0.79	0.82	0.51	1.20	Elevated
Ottawa	61	50501	430556	0.12	0.13	0.02	0.06	1.92	0.76	0.82	0.51	1.20	Elevated
Hartford	62	4366	34617	0.13	0.44	0.05	0.22	-0.02	0.60	0.82	0.51	1.18	Elevated
Savanna	63	24637	170148	0.14	0.33	0.05	0.19	0.32	0.63	0.82	0.51	1.18	Elevated
Olmsted	64	917	7771	0.12	0.17	0.02	0.08	1.59	0.73	0.81	0.51	1.17	Elevated
Marissa	65	531	21501	0.02	0.74	0.02	0.07	1.68	0.74	0.81	0.51	1.17	Elevated
Pawnee	66	18248	81615	0.22	0.12	0.03	0.10	1.29	0.71	0.81	0.51	1.16	Elevated
Smithton	67	8217	81220	0.10	0.17	0.02	0.07	1.68	0.74	0.81	0.50	1.15	Elevated
New Athens	68	1610	36250	0.04	0.38	0.02	0.07	1.68	0.74	0.81	0.50	1.14	Elevated
North City	69	2450	12023	0.20	0.02	0.00	0.02	2.24	0.79	0.81	0.50	1.14	Elevated
Hurst	70	2060	18954	0.11	0.28	0.03	0.12	1.01	0.69	0.81	0.50	1.13	Elevated
East St. Louis	71	1451	18420	0.08	0.20	0.02	0.06	1.68	0.74	0.80	0.50	1.13	Elevated
Caseyville	72	13741	279658	0.05	0.32	0.02	0.06	1.68	0.74	0.80	0.50	1.12	Elevated
Tonica	73	4033	50075	0.08	0.13	0.01	0.04	1.92	0.76	0.80	0.50	1.12	Elevated
Biggsville	74	4267	24365	0.18	0.28	0.05	0.20	0.06	0.61	0.80	0.50	1.12	Elevated
Valier	75	329	6711	0.05	0.07	0.00	0.01	2.24	0.79	0.80	0.50	1.12	Elevated
Marseilles	76	13502	111509	0.12	0.08	0.01	0.04	1.92	0.76	0.80	0.50	1.11	Elevated
Buckner	77	379	10103	0.04	0.07	0.00	0.01	2.24	0.79	0.80	0.50	1.11	Elevated
Riverton	78	7068	68425	0.10	0.22	0.02	0.09	1.29	0.71	0.80	0.50	1.10	Elevated
Bureau Junction	79	909	10200	0.09	0.66	0.06	0.23	-0.40	0.57	0.80	0.50	1.10	Elevated

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Central City	80	3188	21386	0.15	0.21	0.03	0.12	0.87	0.67	0.79	0.49	1.09	Elevated
Benton	81	2843	51717	0.05	0.02	0.00	0.00	2.24	0.79	0.79	0.49	1.08	Elevated
West City	82	193	4125	0.05	0.02	0.00	0.00	2.24	0.79	0.79	0.49	1.08	Elevated
Christopher	83	957	22770	0.04	0.02	0.00	0.00	2.24	0.79	0.79	0.49	1.08	Elevated
Cahokia	84	4629	158830	0.03	0.42	0.01	0.05	1.68	0.74	0.79	0.49	1.07	Elevated
Springerton	85	13	2080	0.01	0.18	0.00	0.00	2.19	0.78	0.79	0.49	1.06	Elevated
Thompsonville	86	251	6716	0.04	0.00	0.00	0.00	2.24	0.79	0.79	0.49	1.06	Elevated
East Carondelet	87	64	4028	0.02	0.74	0.01	0.05	1.68	0.74	0.79	0.49	1.06	Elevated
Equality	88	2639	31360	0.08	0.20	0.02	0.07	1.44	0.72	0.79	0.49	1.06	Elevated
Kangley	89	857	8289	0.10	0.06	0.01	0.03	1.92	0.76	0.79	0.49	1.06	Elevated
Nebo	90	522	14602	0.04	0.46	0.02	0.07	1.43	0.72	0.79	0.49	1.05	Elevated
Mendota	91	21235	438837	0.05	0.11	0.01	0.02	1.92	0.76	0.78	0.49	1.04	Elevated
LaSalle	92	7193	96407	0.07	0.07	0.01	0.02	1.92	0.76	0.78	0.49	1.03	Elevated
Sheridan	93	3018	55486	0.05	0.09	0.00	0.02	1.92	0.76	0.78	0.49	1.03	Elevated
Wataga	94	2494	22536	0.11	0.12	0.01	0.05	1.54	0.73	0.78	0.49	1.03	Elevated
Earlville	95	21343	201079	0.11	0.04	0.00	0.02	1.92	0.76	0.78	0.49	1.02	Elevated
Washington Park	96	1152	12467	0.09	0.10	0.01	0.04	1.68	0.74	0.78	0.48	1.01	Elevated
Spring Bay	97	10248	81113	0.13	0.79	0.10	0.40	-2.61	0.38	0.78	0.48	1.01	Elevated
Brooklyn	98	137	1344	0.10	0.26	0.03	0.11	0.83	0.67	0.78	0.48	1.01	Elevated
Oglesby	99	4623	59311	0.08	0.04	0.00	0.01	1.92	0.76	0.77	0.48	1.00	Elevated
De Soto	100	4165	45165	0.09	0.08	0.01	0.03	1.69	0.74	0.77	0.48	0.99	Elevated
Rockwood	101	691	12777	0.05	0.45	0.02	0.10	0.88	0.67	0.77	0.48	0.99	Elevated
Shiloh	102	12841	206303	0.06	0.12	0.01	0.03	1.68	0.74	0.77	0.48	0.98	Elevated
Troy Grove	103	183	7113	0.03	0.08	0.00	0.01	1.92	0.76	0.77	0.48	0.98	Elevated
Broughton	104	132	1779	0.07	0.20	0.01	0.06	1.32	0.71	0.77	0.48	0.98	Elevated
Thayer	105	3306	26534	0.12	0.12	0.02	0.06	1.29	0.71	0.77	0.48	0.97	Elevated

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Dupo	106	5144	140304	0.04	0.18	0.01	0.03	1.68	0.74	0.77	0.48	0.97	Elevated
Dayton	107	718	20930	0.03	0.04	0.00	0.01	1.92	0.76	0.77	0.48	0.97	Elevated
Freeburg	108	8774	96866	0.09	0.07	0.01	0.03	1.68	0.74	0.77	0.48	0.97	Elevated
Sparland	109	2994	31168	0.10	0.34	0.03	0.13	0.44	0.64	0.77	0.48	0.96	Elevated
Divernon	110	4605	37491	0.12	0.12	0.01	0.06	1.29	0.71	0.77	0.48	0.96	Elevated
Roxana	111	7082	55686	0.13	0.33	0.04	0.17	-0.02	0.60	0.77	0.48	0.96	Elevated
Lebanon	112	2222	49593	0.04	0.13	0.01	0.02	1.68	0.74	0.76	0.48	0.96	Elevated
Keithsburg	113	3553	25423	0.14	0.53	0.07	0.29	-1.56	0.47	0.76	0.48	0.96	Elevated
Fayetteville	114	899	8752	0.10	0.05	0.01	0.02	1.68	0.74	0.76	0.48	0.95	Elevated
Elkville	115	1448	25431	0.06	0.09	0.01	0.02	1.69	0.74	0.76	0.47	0.95	Elevated
Leland	116	315	23642	0.01	0.02	0.00	0.00	1.92	0.76	0.76	0.47	0.95	Elevated
Swansea	117	26250	450423	0.06	0.09	0.01	0.02	1.68	0.74	0.76	0.47	0.95	Elevated
Sauget	118	717	49742	0.01	0.36	0.01	0.02	1.68	0.74	0.76	0.47	0.95	Elevated
Pinckneyville	119	19534	136996	0.14	0.09	0.01	0.05	1.32	0.71	0.76	0.47	0.95	Elevated
Dallas City	120	1761	13539	0.13	0.34	0.04	0.17	-0.16	0.59	0.76	0.47	0.94	Elevated
Springfield	121	141308	1868422	0.08	0.16	0.01	0.05	1.29	0.71	0.76	0.47	0.93	Elevated
Belleville	122	25976	463300	0.06	0.07	0.00	0.02	1.68	0.74	0.76	0.47	0.93	Elevated
Villa Grove	123	18354	111338	0.16	0.41	0.07	0.26	-1.27	0.49	0.76	0.47	0.93	Elevated
Pontoosuc	124	1658	17831	0.09	0.51	0.05	0.19	-0.38	0.57	0.76	0.47	0.92	Elevated
Ridgway	125	801	9882	0.08	0.10	0.01	0.03	1.44	0.72	0.76	0.47	0.92	Elevated
Sumner	126	3625	37506	0.10	0.45	0.04	0.17	-0.23	0.58	0.75	0.47	0.91	Elevated
Decatur	127	175726	2232688	0.08	0.18	0.01	0.06	1.15	0.70	0.75	0.47	0.91	Elevated
Centreville	128	195	17170	0.01	0.23	0.00	0.01	1.68	0.74	0.75	0.47	0.91	Elevated
Vergennes	129	175	1733	0.10	0.02	0.00	0.01	1.69	0.74	0.75	0.47	0.90	Elevated
O'Fallon	130	40173	813755	0.05	0.05	0.00	0.01	1.68	0.74	0.75	0.47	0.90	Elevated
Rochester	131	10222	141867	0.07	0.15	0.01	0.04	1.29	0.71	0.75	0.47	0.90	Elevated
Spaulding	132	3656	58706	0.06	0.17	0.01	0.04	1.29	0.71	0.75	0.47	0.90	Elevated

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Ellisville	133	358	4018	0.09	0.19	0.02	0.07	0.96	0.68	0.75	0.47	0.89	Elevated
Harrison	134	547	26238	0.02	0.03	0.00	0.00	1.69	0.74	0.75	0.46	0.88	Elevated
Leland Grove	135	6768	97453	0.07	0.13	0.01	0.04	1.29	0.71	0.75	0.46	0.87	Elevated
Altona	136	765	26729	0.03	0.13	0.00	0.01	1.54	0.73	0.74	0.46	0.87	Elevated
Millstadt	137	2993	81287	0.04	0.01	0.00	0.00	1.68	0.74	0.74	0.46	0.87	Elevated
Fairview Heights	138	1559	102354	0.02	0.00	0.00	0.00	1.68	0.74	0.74	0.46	0.86	Elevated
Mechanicsburg	139	619	13724	0.05	0.18	0.01	0.03	1.29	0.71	0.74	0.46	0.86	Elevated
Hutsonville	140	6120	54847	0.11	0.30	0.03	0.13	0.09	0.61	0.74	0.46	0.86	Elevated
Knoxville	141	1262	19383	0.07	0.03	0.00	0.01	1.54	0.73	0.74	0.46	0.85	Elevated
Prairie du Rocher	142	2441	29624	0.08	0.19	0.02	0.06	0.88	0.67	0.74	0.46	0.84	Elevated
Holiday Shores	143	17876	183937	0.10	0.36	0.03	0.14	-0.02	0.60	0.74	0.46	0.83	Elevated
Marion	144	49830	876776	0.06	0.12	0.01	0.03	1.30	0.71	0.74	0.46	0.83	Elevated
Dongola	145	5547	43947	0.13	0.18	0.02	0.09	0.53	0.65	0.74	0.46	0.83	Elevated
Abingdon	146	890	14101	0.06	0.02	0.00	0.00	1.54	0.73	0.73	0.46	0.83	Elevated
Williamsfield	147	834	21802	0.04	0.02	0.00	0.00	1.54	0.73	0.73	0.46	0.83	Elevated
Oneida	148	144	16132	0.01	0.05	0.00	0.00	1.54	0.73	0.73	0.46	0.82	Elevated
Fairmont City	149	2349	53537	0.04	0.35	0.02	0.06	0.83	0.67	0.73	0.46	0.82	Elevated
Eldred	150	477	12464	0.04	0.44	0.02	0.07	0.75	0.66	0.73	0.45	0.81	Elevated
Sherman	151	3833	59902	0.06	0.08	0.01	0.02	1.29	0.71	0.73	0.45	0.81	Elevated
Auburn	152	4499	50193	0.09	0.06	0.01	0.02	1.29	0.71	0.73	0.45	0.81	Elevated
Como	153	3094	27269	0.11	0.36	0.04	0.16	-0.40	0.57	0.73	0.45	0.81	Elevated
Banner	154	543	10807	0.05	0.24	0.01	0.05	0.96	0.68	0.73	0.45	0.81	Elevated
Orangeville	155	3367	30788	0.11	0.33	0.04	0.14	-0.17	0.59	0.73	0.45	0.80	Elevated
Grantfork	156	1600	30622	0.05	0.63	0.03	0.13	-0.02	0.60	0.73	0.45	0.80	Elevated
Du Quoin	157	8083	103210	0.08	0.05	0.00	0.02	1.32	0.71	0.73	0.45	0.80	Elevated
New Canton	158	2658	33106	0.08	0.02	0.00	0.01	1.43	0.72	0.73	0.45	0.80	Elevated

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Pleasant Plains	159	1713	54676	0.03	0.13	0.00	0.02	1.29	0.71	0.73	0.45	0.79	Elevated
Collinsville	160	41998	591194	0.07	0.19	0.01	0.05	0.83	0.67	0.73	0.45	0.79	Elevated
Chatham	161	14575	307680	0.05	0.07	0.00	0.01	1.29	0.71	0.72	0.45	0.78	Elevated
Loami	162	1323	24890	0.05	0.06	0.00	0.01	1.29	0.71	0.72	0.45	0.78	Elevated
Pleasant Hill	163	7054	78689	0.09	0.00	0.00	0.00	1.43	0.72	0.72	0.45	0.78	Elevated
Hull	164	1912	33260	0.06	0.00	0.00	0.00	1.43	0.72	0.72	0.45	0.78	Elevated
Hillsboro	165	840	40857	0.02	0.20	0.00	0.02	1.23	0.70	0.72	0.45	0.77	Elevated
Sparta	166	9897	86352	0.11	0.10	0.01	0.04	0.88	0.67	0.72	0.45	0.77	Elevated
Lacon	167	8688	67160	0.13	0.16	0.02	0.08	0.44	0.64	0.72	0.45	0.76	Elevated
Forsyth	168	8601	188273	0.05	0.11	0.01	0.02	1.15	0.70	0.72	0.45	0.76	Elevated
Raymond	169	1065	15762	0.07	0.05	0.00	0.01	1.23	0.70	0.72	0.45	0.76	Elevated
Carbondale	170	34987	525710	0.07	0.12	0.01	0.03	1.01	0.69	0.72	0.45	0.75	Elevated
Junction City	171	955	12529	0.08	0.14	0.01	0.04	0.87	0.67	0.72	0.45	0.75	Elevated
Nokomis	172	1845	30811	0.06	0.05	0.00	0.01	1.23	0.70	0.72	0.44	0.75	Elevated
Jerome	173	5708	93423	0.06	0.02	0.00	0.00	1.29	0.71	0.71	0.44	0.74	Elevated
McLeansboro	174	41	3557	0.01	0.01	0.00	0.00	1.32	0.71	0.71	0.44	0.74	Elevated
Jacksonville	175	40433	591435	0.07	0.14	0.01	0.04	0.87	0.67	0.71	0.44	0.73	Elevated
Williamsville	176	1095	46948	0.02	0.02	0.00	0.00	1.29	0.71	0.71	0.44	0.73	Elevated
Streator	177	46474	434920	0.11	0.12	0.01	0.05	0.70	0.66	0.71	0.44	0.73	Elevated
Muncie	178	478	8629	0.06	0.25	0.01	0.06	0.65	0.66	0.71	0.44	0.73	Elevated
Oquawka	179	1617	20135	0.08	0.33	0.03	0.10	0.06	0.61	0.71	0.44	0.73	Elevated
Watseka	180	49490	546127	0.09	0.46	0.04	0.16	-0.65	0.55	0.71	0.44	0.72	Elevated
Mount Zion	181	10716	220782	0.05	0.06	0.00	0.01	1.15	0.70	0.71	0.44	0.72	Elevated
Wenona	182	428	15299	0.03	0.08	0.00	0.01	1.18	0.70	0.71	0.44	0.72	Elevated
Makanda	183	4181	42344	0.10	0.03	0.00	0.01	1.11	0.69	0.71	0.44	0.71	Elevated
Salem	184	30709	370807	0.08	0.10	0.01	0.03	0.87	0.67	0.71	0.44	0.71	Elevated
Wenonah	185	45	3826	0.01	0.04	0.00	0.00	1.23	0.70	0.71	0.44	0.71	Elevated

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Long Creek	186	8408	214765	0.04	0.05	0.00	0.01	1.15	0.70	0.71	0.44	0.71	Elevated
Farmersville	187	144	4859	0.03	0.01	0.00	0.00	1.23	0.70	0.71	0.44	0.71	Elevated
Litchfield	188	223	49313	0.00	0.05	0.00	0.00	1.23	0.70	0.71	0.44	0.71	Elevated
Mill Creek	189	393	6848	0.06	0.26	0.01	0.06	0.53	0.65	0.70	0.44	0.70	Elevated
Ripley	190	485	7164	0.07	0.14	0.01	0.04	0.77	0.67	0.70	0.44	0.70	Elevated
Rome	191	25931	156883	0.17	0.49	0.08	0.32	-2.61	0.38	0.70	0.44	0.70	Elevated
Belgium	192	2238	32244	0.07	0.17	0.01	0.05	0.65	0.66	0.70	0.44	0.69	Elevated
Argenta	193	637	13397	0.05	0.02	0.00	0.00	1.15	0.70	0.70	0.44	0.69	Elevated
Hillview	194	695	20382	0.03	0.27	0.01	0.04	0.75	0.66	0.70	0.44	0.69	Elevated
Blue Mound	195	387	26542	0.01	0.04	0.00	0.00	1.15	0.70	0.70	0.44	0.68	Elevated
Aroma Park	196	21632	205067	0.11	0.48	0.05	0.20	-1.23	0.50	0.70	0.43	0.67	Elevated
Niantic	197	7	195	0.04	0.00	0.00	0.00	1.15	0.70	0.70	0.43	0.67	Elevated
St. David	198	1058	14209	0.07	0.05	0.00	0.02	0.96	0.68	0.70	0.43	0.67	Elevated
Steeleville	199	2192	61847	0.04	0.14	0.00	0.02	0.88	0.67	0.69	0.43	0.66	Elevated
Vandalia	200	2532	44643	0.06	0.22	0.01	0.05	0.53	0.65	0.69	0.43	0.66	Elevated
Canton	201	8595	116120	0.07	0.04	0.00	0.01	0.96	0.68	0.69	0.43	0.66	Elevated
St. Jacob	202	802	16193	0.05	0.48	0.02	0.09	-0.02	0.60	0.69	0.43	0.65	Elevated
Ruma	203	1478	25620	0.06	0.08	0.00	0.02	0.88	0.67	0.69	0.43	0.65	Elevated
Potomac	204	1670	22118	0.08	0.12	0.01	0.04	0.65	0.66	0.69	0.43	0.65	Elevated
Johnston City	205	4160	48282	0.09	0.18	0.02	0.06	0.33	0.63	0.69	0.43	0.65	Elevated
Peru	206	28127	375698	0.07	0.09	0.01	0.03	0.76	0.66	0.69	0.43	0.64	Elevated
Taylorville	207	6697	97976	0.07	0.21	0.01	0.06	0.35	0.63	0.69	0.43	0.63	Elevated
Bryant	208	400	13802	0.03	0.05	0.00	0.01	0.96	0.68	0.69	0.43	0.63	Elevated
Hardin	209	5039	81397	0.06	0.21	0.01	0.05	0.42	0.64	0.69	0.43	0.63	Elevated
Chandlerville	210	2485	41563	0.06	0.59	0.04	0.14	-0.63	0.55	0.69	0.43	0.63	Elevated
Rossville	211	1450	24070	0.06	0.13	0.01	0.03	0.65	0.66	0.69	0.43	0.63	Elevated
Cambria	212	496	10522	0.05	0.00	0.00	0.00	1.01	0.69	0.69	0.43	0.62	Elevated

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South Jacksonville	213	4089	75616	0.05	0.05	0.00	0.01	0.87	0.67	0.69	0.43	0.62	Elevated
Rankin	214	574	7514	0.08	0.10	0.01	0.03	0.65	0.66	0.69	0.43	0.62	Elevated
Browns	215	550	9823	0.06	0.62	0.03	0.14	-0.62	0.55	0.69	0.43	0.62	Elevated
Greenfield	216	943	15735	0.06	0.09	0.01	0.02	0.75	0.66	0.68	0.43	0.62	Elevated
Carrollton	217	2116	25127	0.08	0.06	0.01	0.02	0.75	0.66	0.68	0.43	0.61	Elevated
Lewistown	218	762	46997	0.02	0.01	0.00	0.00	0.96	0.68	0.68	0.42	0.61	Elevated
Hamilton	219	4271	82167	0.05	0.55	0.03	0.11	-0.38	0.57	0.68	0.42	0.61	Elevated
East Peoria	220	262340	1355192	0.19	0.31	0.06	0.24	-1.91	0.44	0.68	0.42	0.60	Elevated
Nelson	221	1478	22745	0.06	0.49	0.03	0.12	-0.53	0.56	0.68	0.42	0.60	Elevated
Sterling	222	58156	187475	0.31	0.09	0.03	0.11	-0.40	0.57	0.68	0.42	0.60	Elevated
Edinburg	223	5017	53498	0.09	0.13	0.01	0.05	0.35	0.63	0.68	0.42	0.60	Elevated
Indianola	224	454	5507	0.08	0.07	0.01	0.02	0.65	0.66	0.68	0.42	0.60	Elevated
Lawrenceville	225	7593	58045	0.13	0.19	0.02	0.10	-0.23	0.58	0.68	0.42	0.59	Elevated
Andalusia	226	13793	104227	0.13	0.25	0.03	0.13	-0.63	0.55	0.68	0.42	0.59	Elevated
Claremont	227	1083	13459	0.08	0.22	0.02	0.07	0.11	0.61	0.68	0.42	0.59	Elevated
Chester	228	4676	108581	0.04	0.02	0.00	0.00	0.88	0.67	0.68	0.42	0.59	Elevated
Alvan	229	649	10737	0.06	0.08	0.01	0.02	0.65	0.66	0.68	0.42	0.58	Elevated
Sandoval	230	280	9514	0.03	0.01	0.00	0.00	0.87	0.67	0.68	0.42	0.58	Elevated
Iuka	231	88	3258	0.03	0.00	0.00	0.00	0.87	0.67	0.67	0.42	0.57	Elevated
Danville	232	63671	1038856	0.06	0.08	0.00	0.02	0.65	0.66	0.67	0.42	0.57	Elevated
Mount Carroll	233	12358	119412	0.10	0.11	0.01	0.04	0.32	0.63	0.67	0.42	0.56	Elevated
Tovey	234	355	1596	0.22	0.05	0.01	0.04	0.35	0.63	0.67	0.42	0.56	Elevated
Galesburg	235	21313	449447	0.05	0.04	0.00	0.01	0.75	0.66	0.67	0.42	0.56	Elevated
St. Francisville	236	931	8944	0.10	0.22	0.02	0.09	-0.23	0.58	0.67	0.42	0.56	Elevated
Hoopeston	237	2429	56657	0.04	0.08	0.00	0.01	0.65	0.66	0.67	0.42	0.55	Elevated
Mount Vernon	238	14105	312997	0.05	0.10	0.00	0.02	0.61	0.65	0.67	0.42	0.55	Elevated

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Dalzell	239	180	10262	0.02	0.05	0.00	0.00	0.76	0.66	0.67	0.42	0.55	Elevated
North Pekin	240	10963	74805	0.15	0.44	0.06	0.26	-2.25	0.41	0.67	0.42	0.55	Elevated
Bonnie	241	167	5265	0.03	0.12	0.00	0.02	0.61	0.65	0.67	0.41	0.54	Elevated
East Alton	242	6704	42773	0.16	0.11	0.02	0.07	-0.02	0.60	0.67	0.41	0.54	Elevated
Palestine	243	2656	39235	0.07	0.22	0.01	0.06	0.09	0.61	0.67	0.41	0.54	Elevated
Manlius	244	2920	25245	0.12	0.22	0.03	0.10	-0.40	0.57	0.67	0.41	0.54	Elevated
Toluca	245	673	20919	0.03	0.22	0.01	0.03	0.44	0.64	0.67	0.41	0.54	Elevated
Holiday Hills	246	5316	91482	0.06	0.54	0.03	0.12	-0.72	0.54	0.66	0.41	0.53	Elevated
Grand Detour	247	3280	30714	0.11	0.43	0.05	0.18	-1.40	0.48	0.66	0.41	0.53	Elevated
Prophetstown	248	6470	53933	0.12	0.20	0.02	0.10	-0.40	0.57	0.66	0.41	0.53	Elevated
Jonesboro	249	13428	78452	0.17	0.03	0.00	0.02	0.53	0.65	0.66	0.41	0.53	Elevated
South Roxana	250	795	23799	0.03	0.45	0.02	0.06	-0.02	0.60	0.66	0.41	0.51	Elevated
De Pue	251	3049	25655	0.12	0.36	0.04	0.17	-1.32	0.49	0.66	0.41	0.50	Elevated
Westville	252	1221	35527	0.03	0.01	0.00	0.00	0.65	0.66	0.66	0.41	0.50	Elevated
Catlin	253	762	62425	0.01	0.02	0.00	0.00	0.65	0.66	0.66	0.41	0.50	Average
Tilton	254	2728	43067	0.06	0.00	0.00	0.00	0.65	0.66	0.66	0.41	0.50	Average
Hillsdale	255	1893	60835	0.03	0.80	0.02	0.10	-0.52	0.56	0.66	0.41	0.50	Average
Olivet	256	228	10854	0.02	0.00	0.00	0.00	0.65	0.66	0.66	0.41	0.50	Average
Georgetown	257	734	10437	0.07	0.00	0.00	0.00	0.65	0.66	0.66	0.41	0.49	Average
Ashland	258	2370	40145	0.06	0.11	0.01	0.03	0.33	0.63	0.66	0.41	0.49	Average
Waltonville	259	26	878	0.03	0.02	0.00	0.00	0.61	0.65	0.65	0.41	0.49	Average
Maroa	260	4028	16086	0.25	0.05	0.01	0.05	0.04	0.60	0.65	0.41	0.49	Average
Deer Grove	261	510	6390	0.08	0.28	0.02	0.09	-0.40	0.57	0.65	0.41	0.49	Average
Ina	262	432	40230	0.01	0.04	0.00	0.00	0.61	0.65	0.65	0.41	0.49	Average
Bluford	263	116	3478	0.03	0.01	0.00	0.00	0.61	0.65	0.65	0.41	0.49	Average
Pearl City	264	3676	57057	0.06	0.26	0.02	0.07	-0.17	0.59	0.65	0.41	0.48	Average
Nason	265	26	1819	0.01	0.00	0.00	0.00	0.61	0.65	0.65	0.41	0.48	Average

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Freeport	266	40703	342931	0.12	0.14	0.02	0.06	-0.17	0.59	0.65	0.40	0.48	Average
Bush	267	333	4584	0.07	0.08	0.01	0.02	0.33	0.63	0.65	0.40	0.47	Average
Anna	268	10789	230855	0.05	0.02	0.00	0.00	0.53	0.65	0.65	0.40	0.47	Average
Bridgeport	269	3338	55592	0.06	0.29	0.02	0.07	-0.23	0.58	0.65	0.40	0.47	Average
Wonder Lake	270	26731	222606	0.12	0.23	0.03	0.11	-0.72	0.54	0.65	0.40	0.47	Average
Grayville	271	672	6252	0.11	0.05	0.01	0.02	0.32	0.63	0.65	0.40	0.46	Average
Dixon	272	132059	602977	0.22	0.11	0.02	0.09	-0.53	0.56	0.65	0.40	0.46	Average
Avon	273	704	14124	0.05	0.04	0.00	0.01	0.46	0.64	0.65	0.40	0.46	Average
Colp	274	411	8343	0.05	0.08	0.00	0.02	0.33	0.63	0.64	0.40	0.45	Average
Allenville	275	456	6268	0.07	0.18	0.01	0.05	-0.12	0.59	0.64	0.40	0.44	Average
Herrin	276	16681	244371	0.07	0.05	0.00	0.01	0.33	0.63	0.64	0.40	0.44	Average
Pontoon Beach	277	9023	376002	0.02	0.44	0.01	0.04	-0.02	0.60	0.64	0.40	0.43	Average
La Rose	278	40	614	0.07	0.01	0.00	0.00	0.44	0.64	0.64	0.40	0.43	Average
Alton	279	8838	111913	0.08	0.13	0.01	0.04	-0.02	0.60	0.64	0.40	0.43	Average
Bluffs	280	1708	28176	0.06	0.22	0.01	0.05	-0.17	0.59	0.64	0.40	0.42	Average
Hamel	281	36	3099	0.01	0.84	0.01	0.04	-0.02	0.60	0.64	0.40	0.42	Average
Milledgeville	282	4067	31794	0.13	0.02	0.00	0.01	0.32	0.63	0.64	0.40	0.42	Average
Brussels	283	717	12739	0.06	0.13	0.01	0.03	0.09	0.61	0.64	0.40	0.41	Average
Kincaid	284	603	9006	0.07	0.02	0.00	0.01	0.35	0.63	0.64	0.40	0.41	Average
Keyesport	285	2518	23699	0.11	0.34	0.04	0.14	-1.30	0.49	0.63	0.39	0.41	Average
Walnut	286	7229	65957	0.11	0.16	0.02	0.07	-0.40	0.57	0.63	0.39	0.41	Average
Palmer	287	173	5365	0.03	0.03	0.00	0.00	0.35	0.63	0.63	0.39	0.40	Average
East Moline	288	26346	429079	0.06	0.35	0.02	0.09	-0.63	0.55	0.63	0.39	0.40	Average
Venice	289	186	4491	0.04	0.20	0.01	0.03	-0.02	0.60	0.63	0.39	0.40	Average
Winchester	290	1603	9057	0.18	0.06	0.01	0.05	-0.17	0.59	0.63	0.39	0.40	Average
Thomson	291	350	6820	0.05	0.02	0.00	0.00	0.32	0.63	0.63	0.39	0.39	Average
Stonington	292	41	4806	0.01	0.05	0.00	0.00	0.35	0.63	0.63	0.39	0.39	Average

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Langleyville	293	292	5660	0.05	0.00	0.00	0.00	0.35	0.63	0.63	0.39	0.39	Average
Energy	294	2399	43653	0.05	0.01	0.00	0.00	0.33	0.63	0.63	0.39	0.39	Average
Mount Carmel	295	10854	116603	0.09	0.11	0.01	0.04	-0.14	0.59	0.63	0.39	0.39	Average
Carterville	296	1979	94713	0.02	0.01	0.00	0.00	0.33	0.63	0.63	0.39	0.38	Average
East Dubuque	297	17687	127351	0.14	0.19	0.03	0.11	-0.93	0.52	0.63	0.39	0.38	Average
Arthur	298	22385	218076	0.10	0.21	0.02	0.09	-0.70	0.54	0.63	0.39	0.38	Average
Erie	299	4831	87997	0.05	0.28	0.02	0.06	-0.40	0.57	0.63	0.39	0.38	Average
Pittsburg	300	42	2229	0.02	0.00	0.00	0.00	0.33	0.63	0.63	0.39	0.38	Average
St. Libory	301	363	19612	0.02	0.05	0.00	0.00	0.28	0.62	0.63	0.39	0.38	Average
Sidney	302	12175	91038	0.13	0.32	0.04	0.17	-1.70	0.46	0.63	0.39	0.38	Average
Lomax	303	65	3127	0.02	0.26	0.01	0.02	0.06	0.61	0.63	0.39	0.38	Average
New Baden	304	3958	40492	0.10	0.06	0.01	0.02	0.02	0.60	0.63	0.39	0.37	Average
Gladstone	305	580	8405	0.07	0.08	0.01	0.02	0.06	0.61	0.63	0.39	0.37	Average
Cissna Park	306	3666	49625	0.07	0.27	0.02	0.08	-0.65	0.55	0.63	0.39	0.37	Average
Albany	307	2312	19877	0.12	0.13	0.01	0.06	-0.40	0.57	0.63	0.39	0.37	Average
Chrisman	308	1989	28349	0.07	0.06	0.00	0.02	0.09	0.61	0.63	0.39	0.37	Average
New Bedford	309	1089	11907	0.09	0.16	0.01	0.06	-0.40	0.57	0.62	0.39	0.36	Average
Carbon Cliff	310	8239	127148	0.06	0.30	0.02	0.08	-0.63	0.55	0.62	0.39	0.36	Average
New Boston	311	1510	17762	0.09	0.46	0.04	0.15	-1.56	0.47	0.62	0.39	0.36	Average
Ridott	312	387	10746	0.04	0.27	0.01	0.04	-0.17	0.59	0.62	0.39	0.36	Average
Stoy	313	109	2652	0.04	0.10	0.00	0.02	0.09	0.61	0.62	0.39	0.36	Average
Morrison	314	12813	164196	0.08	0.18	0.01	0.06	-0.40	0.57	0.62	0.39	0.36	Average
Paris	315	2590	63664	0.04	0.09	0.00	0.01	0.09	0.61	0.62	0.39	0.36	Average
Wood River	316	8593	162044	0.05	0.11	0.01	0.02	-0.02	0.60	0.62	0.39	0.35	Average
Maryville	317	2525	81026	0.03	0.18	0.01	0.02	-0.02	0.60	0.62	0.39	0.35	Average
Arenzville	318	311	10156	0.03	0.09	0.00	0.01	0.12	0.61	0.62	0.39	0.35	Average
Edwardsville	319	10104	334774	0.03	0.18	0.01	0.02	-0.02	0.60	0.62	0.39	0.35	Average

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Cordova	320	3385	30439	0.11	0.16	0.02	0.07	-0.63	0.55	0.62	0.39	0.34	Average
Highland	321	4012	166694	0.02	0.20	0.00	0.02	-0.02	0.60	0.62	0.38	0.34	Average
Iroquois	322	1969	16900	0.12	0.16	0.02	0.07	-0.65	0.55	0.62	0.38	0.33	Average
Lyndon	323	1238	10976	0.11	0.11	0.01	0.05	-0.40	0.57	0.62	0.38	0.33	Average
Peoria Heights	324	31439	367853	0.09	0.66	0.06	0.22	-2.49	0.39	0.62	0.38	0.33	Average
Glen Carbon	325	82	2806	0.03	0.15	0.00	0.02	-0.02	0.60	0.62	0.38	0.33	Average
Moline	326	151089	1582437	0.10	0.18	0.02	0.07	-0.63	0.55	0.62	0.38	0.33	Average
Golden Gate	327	118	1482	0.08	0.06	0.00	0.02	-0.07	0.59	0.61	0.38	0.32	Average
Olney	328	6143	113024	0.05	0.02	0.00	0.00	0.11	0.61	0.61	0.38	0.32	Average
Parkersburg	329	263	4541	0.06	0.01	0.00	0.00	0.11	0.61	0.61	0.38	0.31	Average
Hume	330	147	12573	0.01	0.05	0.00	0.00	0.09	0.61	0.61	0.38	0.30	Average
Granite City	331	4586	258157	0.02	0.14	0.00	0.01	-0.02	0.60	0.61	0.38	0.30	Average
Robinson	332	3587	180883	0.02	0.01	0.00	0.00	0.09	0.61	0.61	0.38	0.30	Average
Flat Rock	333	13	1038	0.01	0.01	0.00	0.00	0.09	0.61	0.61	0.38	0.30	Average
Bethalto	334	5879	199530	0.03	0.08	0.00	0.01	-0.02	0.60	0.61	0.38	0.30	Average
Martinsville	335	2659	29017	0.09	0.09	0.01	0.03	-0.29	0.58	0.61	0.38	0.30	Average
Troy	336	1387	132605	0.01	0.21	0.00	0.01	-0.02	0.60	0.61	0.38	0.29	Average
Quincy	337	65005	1045083	0.06	0.07	0.00	0.02	-0.13	0.59	0.61	0.38	0.29	Average
Elkhart	338	501	19792	0.03	0.12	0.00	0.01	-0.06	0.60	0.61	0.38	0.29	Average
Louisville	339	1141	7110	0.16	0.04	0.01	0.03	-0.25	0.58	0.61	0.38	0.29	Average
Milan	340	23372	369522	0.06	0.24	0.01	0.06	-0.63	0.55	0.61	0.38	0.29	Average
Fulton	341	9991	116422	0.09	0.12	0.01	0.04	-0.40	0.57	0.61	0.38	0.29	Average
Media	342	25	735	0.03	0.00	0.00	0.00	0.06	0.61	0.61	0.38	0.29	Average
Nauvoo	343	188	6293	0.03	0.31	0.01	0.04	-0.38	0.57	0.61	0.38	0.28	Average
Seatonville	344	1061	13120	0.08	0.12	0.01	0.04	-0.40	0.57	0.61	0.38	0.28	Average
Williamson	345	11	1794	0.01	0.82	0.01	0.02	-0.18	0.59	0.61	0.38	0.28	Average
Warsaw	346	822	23755	0.03	0.27	0.01	0.04	-0.38	0.57	0.61	0.38	0.28	Average

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Exeter	347	297	4980	0.06	0.08	0.00	0.02	-0.17	0.59	0.60	0.38	0.28	Average
Mitchell	348	430	27856	0.02	0.08	0.00	0.01	-0.02	0.60	0.60	0.38	0.28	Average
Bradford	349	2627	22827	0.12	0.18	0.02	0.08	-0.92	0.52	0.60	0.38	0.28	Average
Dalton City	350	566	38524	0.01	0.22	0.00	0.01	-0.12	0.59	0.60	0.38	0.28	Average
Johnsburg	351	38616	481638	0.08	0.20	0.02	0.06	-0.72	0.54	0.60	0.37	0.27	Average
Livingston	352	50	2196	0.02	0.03	0.00	0.00	-0.02	0.60	0.60	0.37	0.27	Average
Lincoln	353	11328	300659	0.04	0.04	0.00	0.01	-0.06	0.60	0.60	0.37	0.27	Average
Henry	354	5057	31555	0.16	0.12	0.02	0.08	-0.90	0.53	0.60	0.37	0.27	Average
Centralia	355	6469	116276	0.06	0.13	0.01	0.03	-0.32	0.57	0.60	0.37	0.27	Average
Rosewood Heights	356	3354	92645	0.04	0.02	0.00	0.00	-0.02	0.60	0.60	0.37	0.27	Average
Gibson City	357	46	3423	0.01	0.02	0.00	0.00	-0.02	0.60	0.60	0.37	0.26	Average
Macomb	358	22639	362237	0.06	0.08	0.00	0.02	-0.24	0.58	0.60	0.37	0.26	Average
Ste. Marie	359	394	3074	0.13	0.15	0.02	0.07	-0.90	0.53	0.60	0.37	0.26	Average
Clay City	360	1407	27939	0.05	0.10	0.00	0.02	-0.25	0.58	0.60	0.37	0.26	Average
Roseville	361	74	21184	0.00	0.05	0.00	0.00	-0.04	0.60	0.60	0.37	0.25	Average
Charleston	362	28262	329518	0.09	0.14	0.01	0.05	-0.60	0.55	0.60	0.37	0.25	Average
Little York	363	70	4150	0.02	0.01	0.00	0.00	-0.04	0.60	0.60	0.37	0.25	Average
Wamac	364	2746	28929	0.09	0.13	0.01	0.05	-0.63	0.55	0.60	0.37	0.25	Average
Hampton	365	2879	31008	0.09	0.13	0.01	0.05	-0.63	0.55	0.60	0.37	0.25	Average
Wyanet	366	655	7639	0.09	0.09	0.01	0.03	-0.40	0.57	0.60	0.37	0.25	Average
Fairfield	367	870	15132	0.06	0.01	0.00	0.00	-0.07	0.59	0.60	0.37	0.24	Average
Bethany	368	714	20237	0.04	0.04	0.00	0.01	-0.12	0.59	0.60	0.37	0.24	Average
Wayne City	369	186	13244	0.01	0.02	0.00	0.00	-0.07	0.59	0.60	0.37	0.24	Average
Sims	370	195	3814	0.05	0.00	0.00	0.00	-0.07	0.59	0.60	0.37	0.24	Average
La Moille	371	634	12037	0.05	0.13	0.01	0.03	-0.40	0.57	0.59	0.37	0.24	Average
Rock Island	372	56122	966299	0.06	0.20	0.01	0.05	-0.63	0.55	0.59	0.37	0.24	Average

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Galena	373	31418	213166	0.15	0.12	0.02	0.07	-0.93	0.52	0.59	0.37	0.23	Average
Sullivan	374	1104	52102	0.02	0.03	0.00	0.00	-0.12	0.59	0.59	0.37	0.23	Average
Cedarville	375	1420	49582	0.03	0.05	0.00	0.01	-0.17	0.59	0.59	0.37	0.23	Average
Lovington	376	201	23447	0.01	0.04	0.00	0.00	-0.12	0.59	0.59	0.37	0.23	Average
Loraine	377	416	5197	0.08	0.00	0.00	0.00	-0.13	0.59	0.59	0.37	0.22	Average
Stonefort	378	385	6812	0.06	0.29	0.02	0.06	-0.90	0.53	0.59	0.37	0.22	Average
Stone Park	379	23466	543040	0.04	0.43	0.02	0.07	-1.01	0.52	0.59	0.37	0.22	Average
Bellwood	380	58199	611790	0.10	0.20	0.02	0.07	-1.01	0.52	0.59	0.37	0.21	Average
Mulberry Grove	381	924	15883	0.06	0.02	0.00	0.00	-0.21	0.58	0.59	0.37	0.21	Average
Milford	382	2051	26617	0.08	0.14	0.01	0.04	-0.65	0.55	0.59	0.37	0.21	Average
Lena	383	316	31625	0.01	0.00	0.00	0.00	-0.17	0.59	0.59	0.36	0.20	Average
South Beloit	384	69304	475998	0.15	0.19	0.03	0.11	-1.45	0.48	0.59	0.36	0.20	Average
Dixmoor	385	8443	79705	0.11	0.17	0.02	0.07	-1.01	0.52	0.59	0.36	0.20	Average
Cherry	386	676	13223	0.05	0.09	0.00	0.02	-0.40	0.57	0.59	0.36	0.20	Average
Columbia	387	9039	185294	0.05	0.39	0.02	0.08	-1.08	0.51	0.59	0.36	0.20	Average
Pontiac	388	21858	334348	0.07	0.11	0.01	0.03	-0.53	0.56	0.59	0.36	0.20	Average
Sheffield	389	595	7590	0.08	0.06	0.00	0.02	-0.40	0.57	0.58	0.36	0.19	Average
Richmond	390	13887	177422	0.08	0.14	0.01	0.04	-0.72	0.54	0.58	0.36	0.19	Average
Bushnell	391	57	1447	0.04	0.01	0.00	0.00	-0.24	0.58	0.58	0.36	0.19	Average
Kingston Mines	392	1338	14824	0.09	0.40	0.04	0.14	-1.91	0.44	0.58	0.36	0.19	Average
Carlinville	393	5405	56696	0.10	0.03	0.00	0.01	-0.34	0.57	0.58	0.36	0.18	Average
Farmington	394	596	14829	0.04	0.04	0.00	0.01	-0.30	0.58	0.58	0.36	0.18	Average
Rock Falls	395	8102	152069	0.05	0.07	0.00	0.01	-0.40	0.57	0.58	0.36	0.18	Average
Forrest	396	2748	53635	0.05	0.11	0.01	0.02	-0.53	0.56	0.58	0.36	0.17	Average
Oakland	397	2046	35460	0.06	0.12	0.01	0.03	-0.60	0.55	0.58	0.36	0.17	Average
Hollowayville	398	273	7387	0.04	0.08	0.00	0.01	-0.40	0.57	0.58	0.36	0.17	Average

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La Harpe	399	852	17887	0.05	0.05	0.00	0.01	-0.38	0.57	0.58	0.36	0.17	Average
Marshall	400	908	23953	0.04	0.00	0.00	0.00	-0.29	0.58	0.58	0.36	0.16	Average
Reynolds	401	4114	27784	0.15	0.12	0.02	0.07	-1.10	0.51	0.58	0.36	0.16	Average
Ashmore	402	2307	26132	0.09	0.07	0.01	0.03	-0.60	0.55	0.58	0.36	0.16	Average
Mineral	403	108	3091	0.03	0.06	0.00	0.01	-0.40	0.57	0.58	0.36	0.16	Average
Carthage	404	5138	96976	0.05	0.03	0.00	0.01	-0.38	0.57	0.58	0.36	0.16	Average
Hettick	405	205	8808	0.02	0.03	0.00	0.00	-0.34	0.57	0.58	0.36	0.15	Average
Elvaston	406	146	4039	0.04	0.04	0.00	0.01	-0.38	0.57	0.57	0.36	0.15	Average
Pierron	407	353	7224	0.05	0.07	0.00	0.01	-0.49	0.56	0.57	0.36	0.15	Average
Pana	408	1974	27716	0.07	0.05	0.00	0.01	-0.51	0.56	0.57	0.36	0.14	Average
Staunton	409	562	17027	0.03	0.00	0.00	0.00	-0.34	0.57	0.57	0.36	0.14	Average
Princeton	410	6808	160744	0.04	0.03	0.00	0.00	-0.40	0.57	0.57	0.36	0.14	Average
Summit	411	5325	43319	0.12	0.11	0.01	0.05	-1.01	0.52	0.57	0.35	0.13	Average
Greenwood	412	2305	35290	0.07	0.12	0.01	0.03	-0.72	0.54	0.57	0.35	0.13	Average
River Forest	413	18915	183398	0.10	0.13	0.01	0.05	-1.01	0.52	0.57	0.35	0.13	Average
Burnham	414	2276	40094	0.06	0.24	0.01	0.05	-1.01	0.52	0.57	0.35	0.13	Average
Eldorado	415	18956	157099	0.12	0.31	0.04	0.15	-2.12	0.42	0.57	0.35	0.13	Average
Buda	416	55	1975	0.03	0.01	0.00	0.00	-0.40	0.57	0.57	0.35	0.13	Average
Crescent City	417	1371	20588	0.07	0.08	0.01	0.02	-0.65	0.55	0.57	0.35	0.13	Average
Amboy	418	7475	100909	0.07	0.04	0.00	0.01	-0.53	0.56	0.57	0.35	0.12	Average
Tiskilwa	419	109	5683	0.02	0.01	0.00	0.00	-0.40	0.57	0.57	0.35	0.12	Average
Ladd	420	55	7255	0.01	0.00	0.00	0.00	-0.40	0.57	0.57	0.35	0.12	Average
Farmer City	421	4068	41877	0.10	0.14	0.01	0.05	-1.07	0.51	0.57	0.35	0.11	Average
Melrose Park	422	132604	1385203	0.10	0.13	0.01	0.05	-1.01	0.52	0.57	0.35	0.11	Average
Rapids City	423	5159	43260	0.12	0.04	0.00	0.02	-0.63	0.55	0.57	0.35	0.11	Average
Lakewood	424	10786	272564	0.04	0.15	0.01	0.02	-0.72	0.54	0.56	0.35	0.11	Average
Moweaqua	425	311	11752	0.03	0.05	0.00	0.01	-0.51	0.56	0.56	0.35	0.10	Average

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Northfield	426	34829	608313	0.06	0.21	0.01	0.05	-1.01	0.52	0.56	0.35	0.10	Average
River Grove	427	12674	231814	0.05	0.22	0.01	0.05	-1.01	0.52	0.56	0.35	0.10	Average
Rochelle	428	43608	585585	0.07	0.27	0.02	0.08	-1.40	0.48	0.56	0.35	0.10	Average
Fairbury	429	1729	29969	0.06	0.02	0.00	0.00	-0.53	0.56	0.56	0.35	0.09	Average
Riverside	430	20190	317717	0.06	0.18	0.01	0.04	-1.01	0.52	0.56	0.35	0.09	Average
Oakwood Hills	431	10289	239523	0.04	0.11	0.00	0.02	-0.72	0.54	0.56	0.35	0.09	Average
Somonauk	432	1598	44842	0.04	0.03	0.00	0.00	-0.55	0.56	0.56	0.35	0.09	Average
Lake Summerset	433	2819	86562	0.03	0.20	0.01	0.03	-0.81	0.53	0.56	0.35	0.09	Average
Hanover	434	3772	46240	0.08	0.11	0.01	0.04	-0.93	0.52	0.56	0.35	0.09	Average
Port Byron	435	1862	26176	0.07	0.04	0.00	0.01	-0.63	0.55	0.56	0.35	0.09	Average
Long Point	436	86	2742	0.03	0.02	0.00	0.00	-0.53	0.56	0.56	0.35	0.08	Average
Bartonville	437	22283	346669	0.06	0.35	0.02	0.09	-1.56	0.47	0.56	0.35	0.08	Average
Virginia	438	1435	37747	0.04	0.06	0.00	0.01	-0.63	0.55	0.56	0.35	0.08	Average
Steward	439	50	5733	0.01	0.02	0.00	0.00	-0.53	0.56	0.56	0.35	0.08	Average
Ashton	440	52	3042	0.02	0.01	0.00	0.00	-0.53	0.56	0.56	0.35	0.08	Average
Saunemin	441	49	4349	0.01	0.01	0.00	0.00	-0.53	0.56	0.56	0.35	0.08	Average
Chatsworth	442	2	506	0.00	0.00	0.00	0.00	-0.53	0.56	0.56	0.35	0.07	Average
Leaf River	443	3975	23134	0.17	0.21	0.04	0.15	-2.26	0.41	0.56	0.35	0.07	Average
Ashkum	444	247	10913	0.02	0.10	0.00	0.01	-0.65	0.55	0.56	0.35	0.07	Average
Lake in the Hills	445	39217	1095386	0.04	0.11	0.00	0.01	-0.72	0.54	0.56	0.35	0.07	Average
Westchester	446	61812	749831	0.08	0.12	0.01	0.04	-1.01	0.52	0.55	0.35	0.07	Average
Seneca	447	6210	96181	0.06	0.15	0.01	0.04	-1.02	0.52	0.55	0.34	0.07	Average
McHenry	448	29818	535864	0.06	0.06	0.00	0.01	-0.72	0.54	0.55	0.34	0.06	Average
Gilman	449	877	29924	0.03	0.06	0.00	0.01	-0.65	0.55	0.55	0.34	0.06	Average
Mattoon	450	3767	150422	0.03	0.02	0.00	0.00	-0.60	0.55	0.55	0.34	0.06	Average
Lyons	451	11799	151951	0.08	0.12	0.01	0.04	-1.01	0.52	0.55	0.34	0.06	Average

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Thawville	452	189	4075	0.05	0.03	0.00	0.01	-0.65	0.55	0.55	0.34	0.06	Average
Albers	453	3837	45220	0.08	0.26	0.02	0.09	-1.64	0.46	0.55	0.34	0.05	Average
Sun River Terrace	454	1612	23676	0.07	0.20	0.01	0.05	-1.23	0.50	0.55	0.34	0.05	Average
Marengo	455	7972	386530	0.02	0.13	0.00	0.01	-0.72	0.54	0.55	0.34	0.05	Average
Beardstown	456	277	7865	0.04	0.02	0.00	0.00	-0.63	0.55	0.55	0.34	0.05	Average
Union	457	5564	167002	0.03	0.08	0.00	0.01	-0.72	0.54	0.55	0.34	0.05	Average
Humboldt	458	339	12968	0.03	0.00	0.00	0.00	-0.60	0.55	0.55	0.34	0.05	Average
North Riverside	459	15895	221842	0.07	0.12	0.01	0.03	-1.01	0.52	0.55	0.34	0.05	Average
Spring Grove	460	34864	471489	0.07	0.03	0.00	0.01	-0.72	0.54	0.55	0.34	0.05	Average
Golf	461	2194	27900	0.08	0.11	0.01	0.03	-1.01	0.52	0.55	0.34	0.04	Average
Silvis	462	2146	52824	0.04	0.01	0.00	0.00	-0.63	0.55	0.55	0.34	0.04	Average
Lynwood	463	5337	199434	0.03	0.30	0.01	0.03	-1.01	0.52	0.55	0.34	0.04	Average
Franklin Park	464	118529	1744238	0.07	0.12	0.01	0.03	-1.01	0.52	0.55	0.34	0.04	Average
Prairie Grove	465	8776	253741	0.03	0.05	0.00	0.01	-0.72	0.54	0.55	0.34	0.04	Average
Clinton	466	16441	114187	0.14	0.06	0.01	0.04	-1.07	0.51	0.55	0.34	0.04	Average
Crystal Lake	467	35615	843276	0.04	0.04	0.00	0.01	-0.72	0.54	0.55	0.34	0.03	Average
South Holland	468	56527	749828	0.08	0.10	0.01	0.03	-1.01	0.52	0.55	0.34	0.03	Average
Robbins	469	10905	269639	0.04	0.19	0.01	0.03	-1.01	0.52	0.55	0.34	0.03	Average
Des Plaines	470	206126	3538235	0.06	0.13	0.01	0.03	-1.01	0.52	0.55	0.34	0.03	Average
Cary	471	27754	644760	0.04	0.03	0.00	0.01	-0.72	0.54	0.55	0.34	0.03	Average
Harvard	472	4439	180698	0.02	0.05	0.00	0.01	-0.72	0.54	0.55	0.34	0.03	Average
Woodstock	473	29290	1433845	0.02	0.06	0.00	0.00	-0.72	0.54	0.55	0.34	0.03	Average
Chemung	474	333	8788	0.04	0.03	0.00	0.00	-0.72	0.54	0.55	0.34	0.03	Average
Prospect Heights	475	54827	1211728	0.05	0.16	0.01	0.03	-1.01	0.52	0.54	0.34	0.03	Average
Bull Valley	476	3377	226092	0.01	0.06	0.00	0.00	-0.72	0.54	0.54	0.34	0.02	Average

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Ringwood	477	2000	77083	0.03	0.02	0.00	0.00	-0.72	0.54	0.54	0.34	0.02	Average
Washburn	478	8142	78014	0.10	0.18	0.02	0.08	-1.61	0.47	0.54	0.34	0.01	Average
Godfrey	479	15537	447821	0.03	0.10	0.00	0.01	-0.87	0.53	0.54	0.34	0.01	Average
Browning	480	322	10632	0.03	0.78	0.02	0.09	-1.81	0.45	0.54	0.34	0.01	Average
East Hazel Crest	481	4825	22026	0.22	0.03	0.01	0.03	-1.01	0.52	0.54	0.34	0.01	Average
Glenwood	482	6260	128879	0.05	0.13	0.01	0.03	-1.01	0.52	0.54	0.34	0.01	Average
Durand	483	5446	77598	0.07	0.22	0.02	0.06	-1.45	0.48	0.54	0.34	0.01	Average
Forest View	484	1028	22656	0.05	0.14	0.01	0.02	-1.01	0.52	0.54	0.34	0.01	Average
Hebron	485	439	51001	0.01	0.01	0.00	0.00	-0.72	0.54	0.54	0.34	0.01	Average
McCullom Lake	486	302	20116	0.02	0.01	0.00	0.00	-0.72	0.54	0.54	0.34	0.01	Average
Winnetka	487	16143	677525	0.02	0.26	0.01	0.02	-1.01	0.52	0.54	0.34	0.01	Average
Schiller Park	488	30178	890553	0.03	0.18	0.01	0.02	-1.01	0.52	0.54	0.34	0.01	Average
Trout Valley	489	37	44618	0.00	0.01	0.00	0.00	-0.72	0.54	0.54	0.34	0.01	Average
Spring Valley	490	26221	234702	0.11	0.11	0.01	0.05	-1.32	0.49	0.54	0.34	0.01	Average
Ford Heights	491	4834	176918	0.03	0.22	0.01	0.02	-1.01	0.52	0.54	0.34	0.00	Average
Pekin	492	75584	432837	0.17	0.14	0.02	0.10	-1.91	0.44	0.54	0.34	0.00	Average
La Grange Park	493	8225	93788	0.09	0.07	0.01	0.02	-1.01	0.52	0.54	0.34	0.00	Average
Harvey	494	19273	482983	0.04	0.14	0.01	0.02	-1.01	0.52	0.54	0.33	0.00	Average
Toulon	495	754	16442	0.05	0.08	0.00	0.01	-0.92	0.52	0.54	0.33	0.00	Average
Olympia Fields	496	27497	393791	0.07	0.08	0.01	0.02	-1.01	0.52	0.54	0.33	0.00	Average
Brookfield	497	21503	305180	0.07	0.07	0.01	0.02	-1.01	0.52	0.54	0.33	-0.01	Average
Oak Forest	498	43651	779163	0.06	0.09	0.00	0.02	-1.01	0.52	0.54	0.33	-0.01	Average
Rosemont	499	99770	1294230	0.08	0.06	0.00	0.02	-1.01	0.52	0.54	0.33	-0.01	Average
McCook	500	8987	117996	0.08	0.06	0.00	0.02	-1.01	0.52	0.54	0.33	-0.01	Average
Posen	501	8890	228827	0.04	0.12	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average
Calumet City	502	53596	791342	0.07	0.07	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average

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Forest Park	503	14984	187233	0.08	0.06	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average
Lansing	504	49743	893897	0.06	0.08	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average
Newman	505	2100	25910	0.08	0.12	0.01	0.04	-1.27	0.49	0.53	0.33	-0.02	Average
Midlothian	506	21575	547511	0.04	0.11	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average
Greenup	507	3447	25802	0.13	0.04	0.01	0.02	-1.05	0.51	0.53	0.33	-0.02	Average
Crestwood	508	24893	454940	0.05	0.08	0.00	0.02	-1.01	0.52	0.53	0.33	-0.02	Average
Wheeler	509	70	3649	0.02	0.10	0.00	0.01	-0.90	0.53	0.53	0.33	-0.03	Average
Hazel Crest	510	28607	566564	0.05	0.08	0.00	0.02	-1.01	0.52	0.53	0.33	-0.03	Average
Newton	511	3454	36071	0.10	0.02	0.00	0.01	-0.90	0.53	0.53	0.33	-0.03	Average
Flossmoor	512	22648	466812	0.05	0.08	0.00	0.02	-1.01	0.52	0.53	0.33	-0.03	Average
Chicago Ridge	513	34402	601886	0.06	0.07	0.00	0.02	-1.01	0.52	0.53	0.33	-0.03	Average
Indian Head Park	514	10415	246489	0.04	0.09	0.00	0.02	-1.01	0.52	0.53	0.33	-0.03	Average
Morton Grove	515	14834	209315	0.07	0.05	0.00	0.02	-1.01	0.52	0.53	0.33	-0.03	Average
Palos Heights	516	33851	675171	0.05	0.07	0.00	0.01	-1.01	0.52	0.53	0.33	-0.04	Average
Greenville	517	3680	49648	0.07	0.03	0.00	0.01	-0.95	0.52	0.53	0.33	-0.04	Average
Park Ridge	518	86352	986190	0.09	0.04	0.00	0.01	-1.01	0.52	0.53	0.33	-0.04	Average
Menominee	519	882	36749	0.02	0.07	0.00	0.01	-0.93	0.52	0.53	0.33	-0.04	Average
Glencoe	520	10357	253494	0.04	0.08	0.00	0.01	-1.01	0.52	0.53	0.33	-0.04	Average
Oak Lawn	521	43821	895881	0.05	0.06	0.00	0.01	-1.01	0.52	0.53	0.33	-0.04	Average
Orland Hills	522	8837	277007	0.03	0.09	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Hennepin	523	960	18312	0.05	0.18	0.01	0.04	-1.32	0.49	0.53	0.33	-0.05	Average
Chicago Heights	524	32273	723649	0.04	0.07	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Rolling Meadows	525	65653	1379199	0.05	0.06	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Apple Canyon Lake	526	813	136818	0.01	0.17	0.00	0.00	-0.93	0.52	0.53	0.33	-0.05	Average

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Justice	527	7859	275612	0.03	0.09	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Elmwood Park	528	7068	137751	0.05	0.05	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Coal Valley	529	10915	248879	0.04	0.11	0.00	0.02	-1.11	0.51	0.53	0.33	-0.05	Average
The Galena Territory	530	4936	231733	0.02	0.04	0.00	0.00	-0.93	0.52	0.53	0.33	-0.05	Average
Muddy	531	970	16843	0.06	0.46	0.03	0.10	-2.12	0.42	0.53	0.33	-0.05	Average
Tuscola	532	9342	192891	0.05	0.17	0.01	0.03	-1.27	0.49	0.53	0.33	-0.05	Average
Carlyle	533	12201	118404	0.10	0.15	0.02	0.06	-1.64	0.46	0.53	0.33	-0.05	Average
Homewood	534	25361	344740	0.07	0.03	0.00	0.01	-1.01	0.52	0.53	0.33	-0.05	Average
Broadlands	535	546	6922	0.08	0.22	0.02	0.07	-1.70	0.46	0.53	0.33	-0.05	Average
Hodgkins	536	2658	60648	0.04	0.05	0.00	0.01	-1.01	0.52	0.53	0.33	-0.06	Average
Broadview	537	29077	686263	0.04	0.05	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Maywood	538	22800	290553	0.08	0.03	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Dolton	539	7049	165509	0.04	0.05	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Glenview	540	54493	1109365	0.05	0.04	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Riverdale	541	2938	84863	0.03	0.06	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Palos Hills	542	24483	964377	0.03	0.08	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Inverness	543	16157	819119	0.02	0.10	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Markham	544	5491	235628	0.02	0.09	0.00	0.01	-1.01	0.52	0.52	0.33	-0.06	Average
Kankakee	545	115770	1346321	0.09	0.08	0.01	0.03	-1.23	0.50	0.52	0.33	-0.07	Average
Colona	546	11065	175592	0.06	0.23	0.01	0.06	-1.59	0.47	0.52	0.33	-0.07	Average
Camargo	547	797	13092	0.06	0.12	0.01	0.03	-1.27	0.49	0.52	0.33	-0.07	Average
Petersburg	548	9163	60662	0.15	0.17	0.03	0.10	-2.12	0.42	0.52	0.33	-0.07	Average
Northbrook	549	61192	1565153	0.04	0.04	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Niles	550	32819	524394	0.06	0.03	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Palos Park	551	14115	424300	0.03	0.04	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
South Barrington	552	8875	461404	0.02	0.08	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average

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Thornton	553	2213	27922	0.08	0.02	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Alsip	554	22673	650083	0.03	0.04	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Wilmette	555	18762	502307	0.04	0.04	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Streamwood	556	22820	416238	0.05	0.02	0.00	0.01	-1.01	0.52	0.52	0.32	-0.07	Average
Jewett	557	72	2119	0.03	0.06	0.00	0.01	-1.05	0.51	0.52	0.32	-0.07	Average
Worth	558	5002	64753	0.08	0.02	0.00	0.01	-1.01	0.52	0.52	0.32	-0.08	Average
Country Club Hills	559	10988	471739	0.02	0.05	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Blue Island	560	7277	467984	0.02	0.07	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Stickney	561	82	1966	0.04	0.02	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Western Springs	562	4949	136017	0.04	0.03	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Lincolnwood	563	3862	41030	0.09	0.01	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Mount Prospect	564	44048	1711503	0.03	0.04	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Bedford Park	565	3725	122943	0.03	0.03	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Merrionette Park	566	1689	100272	0.02	0.05	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
South Chicago Heights	567	2515	104635	0.02	0.04	0.00	0.00	-1.01	0.52	0.52	0.32	-0.08	Average
Downs	568	12529	50560	0.25	0.11	0.03	0.10	-2.23	0.41	0.52	0.32	-0.09	Average
Calumet Park	569	651	46404	0.01	0.04	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Evanston	570	11052	362847	0.03	0.02	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Hillside	571	1442	13841	0.10	0.00	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Hickory Hills	572	6274	363975	0.02	0.02	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Skokie	573	5730	97209	0.06	0.01	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Kenilworth	574	8898	202106	0.04	0.01	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average
Countryside	575	3634	211773	0.02	0.01	0.00	0.00	-1.01	0.52	0.52	0.32	-0.09	Average

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Bridgeview	576	1796	145195	0.01	0.01	0.00	0.00	-1.01	0.52	0.52	0.32	-0.10	Average
Kenney	577	84	544	0.15	0.01	0.00	0.01	-1.07	0.51	0.52	0.32	-0.10	Average
La Grange	578	154	14449	0.01	0.00	0.00	0.00	-1.01	0.52	0.52	0.32	-0.10	Average
Okawville	579	1867	69490	0.03	0.09	0.00	0.01	-1.13	0.51	0.52	0.32	-0.10	Average
Neoga	580	120	16645	0.01	0.06	0.00	0.00	-1.05	0.51	0.51	0.32	-0.10	Average
Bartelso	581	1898	21835	0.09	0.15	0.01	0.05	-1.64	0.46	0.51	0.32	-0.10	Average
Nashville	582	1828	42148	0.04	0.05	0.00	0.01	-1.13	0.51	0.51	0.32	-0.11	Average
New Milford	583	8235	94236	0.09	0.10	0.01	0.03	-1.45	0.48	0.51	0.32	-0.11	Average
St. Joseph	584	8452	94451	0.09	0.15	0.01	0.05	-1.70	0.46	0.51	0.32	-0.11	Average
Shelbyville	585	1413	23977	0.06	0.11	0.01	0.02	-1.36	0.49	0.51	0.32	-0.12	Average
Rockton	586	5041	94188	0.05	0.15	0.01	0.03	-1.45	0.48	0.51	0.32	-0.12	Average
Sammons Point	587	1390	25570	0.05	0.06	0.00	0.01	-1.23	0.50	0.51	0.32	-0.12	Average
Momence	588	3414	95934	0.04	0.09	0.00	0.01	-1.23	0.50	0.51	0.32	-0.12	Average
Peoria	589	657847	2936813	0.22	0.13	0.03	0.12	-2.49	0.39	0.51	0.32	-0.12	Average
Bradley	590	26551	432577	0.06	0.05	0.00	0.01	-1.23	0.50	0.51	0.32	-0.12	Average
Geneseo	591	13844	126095	0.11	0.10	0.01	0.04	-1.59	0.47	0.51	0.32	-0.13	Average
Saybrook	592	2351	17099	0.14	0.17	0.02	0.09	-2.23	0.41	0.51	0.32	-0.13	Average
Mahomet	593	27092	280756	0.10	0.13	0.01	0.05	-1.70	0.46	0.51	0.32	-0.13	Average
Radom	594	33	1318	0.03	0.00	0.00	0.00	-1.13	0.51	0.51	0.31	-0.14	Average
Harrisburg	595	66699	648510	0.10	0.20	0.02	0.08	-2.12	0.42	0.50	0.31	-0.14	Average
Grafton	596	14112	96212	0.15	0.08	0.01	0.05	-1.71	0.46	0.50	0.31	-0.15	Average
Manteno	597	4223	234865	0.02	0.08	0.00	0.01	-1.23	0.50	0.50	0.31	-0.15	Average
Machesney Park	598	41821	915059	0.05	0.13	0.01	0.02	-1.45	0.48	0.50	0.31	-0.16	Average
Millington	599	4515	49842	0.09	0.34	0.03	0.12	-2.62	0.38	0.50	0.31	-0.16	Average
West Peoria	600	10794	97777	0.11	0.07	0.01	0.03	-1.56	0.47	0.50	0.31	-0.16	Average
Limestone	601	2369	41501	0.06	0.02	0.00	0.00	-1.23	0.50	0.50	0.31	-0.16	Average

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Roscoe	602	16145	422971	0.04	0.14	0.01	0.02	-1.45	0.48	0.50	0.31	-0.16	Average
Grant Park	603	479	21928	0.02	0.01	0.00	0.00	-1.23	0.50	0.50	0.31	-0.17	Average
Bourbonnais	604	8514	773059	0.01	0.02	0.00	0.00	-1.23	0.50	0.50	0.31	-0.17	Average
Pecatonica	605	3210	79432	0.04	0.11	0.00	0.02	-1.45	0.48	0.50	0.31	-0.18	Average
Penfield	606	90	1295	0.07	0.14	0.01	0.04	-1.70	0.46	0.50	0.31	-0.18	Average
Lake of the Woods	607	4713	65429	0.07	0.13	0.01	0.04	-1.70	0.46	0.49	0.31	-0.19	Average
Seaton	608	421	9064	0.05	0.13	0.01	0.02	-1.56	0.47	0.49	0.31	-0.19	Average
Damiansville	609	991	17284	0.06	0.13	0.01	0.03	-1.64	0.46	0.49	0.31	-0.20	Average
Trenton	610	6655	64583	0.10	0.06	0.01	0.02	-1.64	0.46	0.49	0.30	-0.22	Average
Mapleton	611	488	6260	0.08	0.05	0.00	0.02	-1.56	0.47	0.49	0.30	-0.22	Average
Lost Nation	612	1172	16361	0.07	0.00	0.00	0.00	-1.40	0.48	0.48	0.30	-0.23	Average
Germantown	613	2423	57147	0.04	0.13	0.01	0.02	-1.64	0.46	0.48	0.30	-0.23	Average
Breese	614	5482	131445	0.04	0.13	0.01	0.02	-1.64	0.46	0.48	0.30	-0.23	Average
Bellevue	615	12029	199002	0.06	0.04	0.00	0.01	-1.56	0.47	0.48	0.30	-0.25	Average
Elmwood	616	268	9446	0.03	0.08	0.00	0.01	-1.56	0.47	0.48	0.30	-0.26	Average
Sherrard	617	502	53176	0.01	0.22	0.00	0.01	-1.56	0.47	0.48	0.30	-0.26	Average
Princeville	618	1885	64024	0.03	0.07	0.00	0.01	-1.56	0.47	0.48	0.30	-0.26	Average
Sadorus	619	393	8289	0.05	0.10	0.00	0.02	-1.70	0.46	0.48	0.30	-0.26	Average
Creve Coeur	620	882	17533	0.05	0.18	0.01	0.04	-1.91	0.44	0.48	0.30	-0.26	Average
Galatia	621	3446	53548	0.06	0.21	0.01	0.05	-2.12	0.42	0.47	0.30	-0.27	Average
Lake Camelot	622	1117	54050	0.02	0.04	0.00	0.00	-1.56	0.47	0.47	0.29	-0.28	Average
Kewanee	623	7953	158601	0.05	0.03	0.00	0.01	-1.59	0.47	0.47	0.29	-0.28	Average
Dwight	624	18399	241994	0.08	0.20	0.02	0.06	-2.25	0.41	0.47	0.29	-0.28	Average
Elsah	625	3065	48136	0.06	0.05	0.00	0.01	-1.71	0.46	0.47	0.29	-0.29	Average
Aviston	626	776	14970	0.05	0.04	0.00	0.01	-1.64	0.46	0.47	0.29	-0.29	Average
Norwood	627	1627	30401	0.05	0.00	0.00	0.00	-1.56	0.47	0.47	0.29	-0.29	Average

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Dunlap	628	237	13739	0.02	0.01	0.00	0.00	-1.56	0.47	0.47	0.29	-0.29	Average
Bishop Hill	629	12	2442	0.00	0.01	0.00	0.00	-1.59	0.47	0.47	0.29	-0.30	Average
Galva	630	6	170	0.04	0.00	0.00	0.00	-1.59	0.47	0.47	0.29	-0.30	Average
Fisher	631	2028	59536	0.03	0.06	0.00	0.01	-1.70	0.46	0.47	0.29	-0.31	Average
Beckemeyer	632	1303	10594	0.12	0.01	0.00	0.00	-1.64	0.46	0.47	0.29	-0.31	Average
Urbana	633	28014	442836	0.06	0.03	0.00	0.01	-1.70	0.46	0.47	0.29	-0.31	Average
Royal	634	126	1944	0.06	0.02	0.00	0.01	-1.70	0.46	0.46	0.29	-0.32	Average
Hopedale	635	3605	35276	0.10	0.13	0.01	0.05	-2.25	0.41	0.46	0.29	-0.32	Average
Byron	636	16110	161392	0.10	0.13	0.01	0.05	-2.26	0.41	0.46	0.29	-0.33	Average
Champaign	637	26317	1003629	0.03	0.01	0.00	0.00	-1.70	0.46	0.46	0.29	-0.34	Average
Oregon	638	17362	245347	0.07	0.17	0.01	0.05	-2.26	0.41	0.46	0.28	-0.34	Average
Jerseyville	639	520	29783	0.02	0.01	0.00	0.00	-1.71	0.46	0.46	0.28	-0.34	Average
Atwood	640	553	7639	0.07	0.08	0.01	0.02	-1.99	0.43	0.46	0.28	-0.34	Average
Bondville	641	1	192	0.01	0.01	0.00	0.00	-1.70	0.46	0.46	0.28	-0.34	Average
Rantoul	642	29	1193	0.02	0.00	0.00	0.00	-1.70	0.46	0.46	0.28	-0.34	Average
Colfax	643	2829	36408	0.08	0.12	0.01	0.04	-2.23	0.41	0.45	0.28	-0.37	Average
Watson	644	1537	21041	0.07	0.05	0.00	0.01	-1.97	0.44	0.45	0.28	-0.38	Average
McNabb	645	847	9900	0.09	0.10	0.01	0.03	-2.23	0.41	0.45	0.28	-0.39	Average
Port Barrington	646	13282	206507	0.06	0.50	0.03	0.13	-3.36	0.32	0.45	0.28	-0.40	Average
Heyworth	647	5598	64611	0.09	0.09	0.01	0.03	-2.23	0.41	0.44	0.28	-0.41	Average
Effingham	648	8463	222894	0.04	0.03	0.00	0.00	-1.97	0.44	0.44	0.27	-0.42	Average
Teutopolis	649	620	32268	0.02	0.02	0.00	0.00	-1.97	0.44	0.44	0.27	-0.43	Average
Altamont	650	775	23628	0.03	0.01	0.00	0.00	-1.97	0.44	0.44	0.27	-0.43	Average
Morton	651	29351	380611	0.08	0.08	0.01	0.02	-2.25	0.41	0.44	0.27	-0.44	Average
Ivesdale	652	232	5871	0.04	0.12	0.00	0.02	-2.20	0.42	0.43	0.27	-0.44	Average
Towanda	653	3537	43020	0.08	0.06	0.01	0.02	-2.23	0.41	0.43	0.27	-0.44	Average

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Greenview	654	223	7695	0.03	0.09	0.00	0.01	-2.12	0.42	0.43	0.27	-0.45	Average
Tallula	655	450	11072	0.04	0.06	0.00	0.01	-2.12	0.42	0.43	0.27	-0.45	Average
Metropolis	656	25682	235489	0.11	0.33	0.04	0.14	-3.70	0.29	0.43	0.27	-0.46	Average
Carrier Mills	657	1307	50721	0.03	0.06	0.00	0.01	-2.12	0.42	0.43	0.27	-0.47	Average
Carlock	658	831	23037	0.04	0.11	0.00	0.02	-2.23	0.41	0.43	0.27	-0.47	Average
Fox Lake	659	126181	1424372	0.09	0.31	0.03	0.11	-3.36	0.32	0.43	0.27	-0.47	Average
Oakford	660	233	6407	0.04	0.04	0.00	0.01	-2.12	0.42	0.43	0.27	-0.47	Average
Washington	661	25710	387483	0.07	0.06	0.00	0.01	-2.25	0.41	0.43	0.26	-0.48	Average
Joppa	662	1707	11879	0.14	0.23	0.03	0.13	-3.70	0.29	0.42	0.26	-0.49	Average
Standard	663	80	7786	0.01	0.22	0.00	0.01	-2.23	0.41	0.42	0.26	-0.49	Average
Bloomington	664	40699	948342	0.04	0.05	0.00	0.01	-2.23	0.41	0.42	0.26	-0.50	Average
Lexington	665	2571	24341	0.11	0.02	0.00	0.01	-2.23	0.41	0.42	0.26	-0.50	Average
Le Roy	666	1256	26869	0.05	0.03	0.00	0.01	-2.23	0.41	0.42	0.26	-0.51	Low
Pistakee Highlands	667	12732	160202	0.08	0.32	0.03	0.10	-3.36	0.32	0.42	0.26	-0.51	Low
Normal	668	40635	1238923	0.03	0.03	0.00	0.00	-2.23	0.41	0.42	0.26	-0.51	Low
Forreston	669	1100	33672	0.03	0.05	0.00	0.01	-2.26	0.41	0.42	0.26	-0.52	Low
Twin Grove	670	1852	101427	0.02	0.04	0.00	0.00	-2.23	0.41	0.42	0.26	-0.52	Low
Hillcrest	671	251	32317	0.01	0.16	0.00	0.01	-2.26	0.41	0.42	0.26	-0.52	Low
Garden Prairie	672	1195	19581	0.06	0.14	0.01	0.03	-2.62	0.38	0.42	0.26	-0.52	Low
South Pekin	673	6	213	0.03	0.03	0.00	0.00	-2.25	0.41	0.41	0.26	-0.52	Low
Danvers	674	349	12343	0.03	0.01	0.00	0.00	-2.23	0.41	0.41	0.26	-0.53	Low
Adeline	675	732	18486	0.04	0.02	0.00	0.00	-2.26	0.41	0.41	0.26	-0.53	Low
Hudson	676	81	4885	0.02	0.00	0.00	0.00	-2.23	0.41	0.41	0.26	-0.53	Low
Stillman Valley	677	219	6899	0.03	0.01	0.00	0.00	-2.26	0.41	0.41	0.26	-0.54	Low
Mackinaw	678	161	6524	0.02	0.00	0.00	0.00	-2.25	0.41	0.41	0.26	-0.54	Low
Havana	679	3076	40799	0.08	0.10	0.01	0.03	-2.60	0.38	0.41	0.26	-0.54	Low

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Gilberts	680	8605	128900	0.07	0.19	0.01	0.05	-2.89	0.36	0.41	0.25	-0.55	Low
Bath	681	3416	31576	0.11	0.76	0.08	0.32	-6.16	0.08	0.41	0.25	-0.56	Low
De Land	682	583	9253	0.06	0.13	0.01	0.03	-2.70	0.37	0.41	0.25	-0.57	Low
Monticello	683	12782	282907	0.05	0.17	0.01	0.03	-2.70	0.37	0.40	0.25	-0.57	Low
Fults	684	38	1228	0.03	1.00	0.03	0.12	-3.83	0.28	0.40	0.25	-0.58	Low
Cherry Valley	685	15922	430703	0.04	0.31	0.01	0.05	-2.98	0.35	0.40	0.25	-0.61	Low
Sandwich	686	7360	84172	0.09	0.07	0.01	0.02	-2.75	0.37	0.39	0.24	-0.61	Low
East Dundee	687	43655	234560	0.19	0.05	0.01	0.04	-3.04	0.35	0.38	0.24	-0.65	Low
Bay View Gardens	688	5890	46188	0.13	0.18	0.02	0.09	-3.65	0.29	0.38	0.24	-0.65	Low
Lakemoor	689	24835	383666	0.06	0.25	0.02	0.06	-3.36	0.32	0.38	0.24	-0.66	Low
Kirkland	690	4164	77437	0.05	0.15	0.01	0.03	-3.01	0.35	0.38	0.24	-0.67	Low
Kingston	691	4401	89461	0.05	0.16	0.01	0.03	-3.01	0.35	0.38	0.24	-0.67	Low
Mansfield	692	562	17081	0.03	0.02	0.00	0.00	-2.70	0.37	0.38	0.23	-0.69	Low
Genoa	693	4349	82843	0.05	0.13	0.01	0.03	-3.01	0.35	0.38	0.23	-0.69	Low
Bement	694	191	11168	0.02	0.02	0.00	0.00	-2.70	0.37	0.38	0.23	-0.69	Low
Algonquin	695	52494	909040	0.06	0.07	0.00	0.02	-2.89	0.36	0.37	0.23	-0.69	Low
Huntley	696	17128	427970	0.04	0.10	0.00	0.02	-2.89	0.36	0.37	0.23	-0.70	Low
Island Lake	697	30618	602633	0.05	0.28	0.01	0.06	-3.36	0.32	0.37	0.23	-0.70	Low
Riverwoods	698	56233	529317	0.11	0.16	0.02	0.07	-3.51	0.31	0.37	0.23	-0.70	Low
Lockport	699	93236	1274937	0.07	0.18	0.01	0.05	-3.37	0.32	0.37	0.23	-0.72	Low
Rockford	700	216940	4594359	0.05	0.10	0.00	0.02	-2.98	0.35	0.37	0.23	-0.72	Low
Sycamore	701	20522	469498	0.04	0.09	0.00	0.02	-3.01	0.35	0.36	0.23	-0.74	Low
Loves Park	702	42252	1043663	0.04	0.07	0.00	0.01	-2.98	0.35	0.36	0.22	-0.75	Low
DeKalb	703	48188	752701	0.06	0.05	0.00	0.01	-3.01	0.35	0.36	0.22	-0.75	Low
Wheeling	704	162305	2780083	0.06	0.22	0.01	0.05	-3.51	0.31	0.36	0.22	-0.77	Low
Sauk Village	705	13573	249670	0.05	0.17	0.01	0.04	-3.37	0.32	0.35	0.22	-0.78	Low

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Deer Creek	706	77	5486	0.01	0.03	0.00	0.00	-2.95	0.35	0.35	0.22	-0.78	Low
Frankfort	707	95411	1344750	0.07	0.13	0.01	0.04	-3.37	0.32	0.35	0.22	-0.78	Low
El Paso	708	46	1580	0.03	0.00	0.00	0.00	-2.94	0.35	0.35	0.22	-0.78	Low
Hinckley	709	711	30347	0.02	0.06	0.00	0.01	-3.01	0.35	0.35	0.22	-0.78	Low
Hoffman Estates	710	75695	3135653	0.02	0.06	0.00	0.01	-3.04	0.35	0.35	0.22	-0.79	Low
Cortland	711	229	6685	0.03	0.02	0.00	0.00	-3.01	0.35	0.35	0.22	-0.80	Low
Barrington Hills	712	31467	732184	0.04	0.10	0.00	0.02	-3.20	0.33	0.35	0.22	-0.80	Low
Shabbona	713	106	12481	0.01	0.02	0.00	0.00	-3.01	0.35	0.35	0.22	-0.81	Low
East Brooklyn	714	908	10143	0.09	0.22	0.02	0.08	-3.96	0.27	0.35	0.22	-0.81	Low
Tinley Park	715	62119	1235714	0.05	0.11	0.01	0.02	-3.37	0.32	0.34	0.21	-0.85	Low
Matteson	716	26166	702805	0.04	0.14	0.01	0.02	-3.37	0.32	0.34	0.21	-0.85	Low
Fox River Grove	717	10984	257288	0.04	0.11	0.00	0.02	-3.36	0.32	0.34	0.21	-0.86	Low
Highland Park	718	268306	3623461	0.07	0.10	0.01	0.03	-3.51	0.31	0.34	0.21	-0.86	Low
Frankfort Square	719	15102	402342	0.04	0.12	0.00	0.02	-3.37	0.32	0.34	0.21	-0.86	Low
Itasca	720	98129	1035847	0.09	0.12	0.01	0.04	-3.69	0.29	0.34	0.21	-0.86	Low
Morris	721	85668	854568	0.10	0.16	0.02	0.06	-3.96	0.27	0.33	0.21	-0.88	Low
Mokena	722	39032	979195	0.04	0.08	0.00	0.01	-3.37	0.32	0.33	0.21	-0.88	Low
Richton Park	723	11456	366655	0.03	0.09	0.00	0.01	-3.37	0.32	0.33	0.20	-0.89	Low
Willow Springs	724	12698	306095	0.04	0.23	0.01	0.04	-3.69	0.29	0.33	0.20	-0.89	Low
Steger	725	3813	98868	0.04	0.06	0.00	0.01	-3.37	0.32	0.33	0.20	-0.90	Low
Orland Park	726	55288	1802403	0.03	0.07	0.00	0.01	-3.37	0.32	0.33	0.20	-0.90	Low
Homer Glen	727	55986	1664563	0.03	0.07	0.00	0.01	-3.37	0.32	0.33	0.20	-0.90	Low
Buffalo Grove	728	181367	2948296	0.06	0.08	0.00	0.02	-3.51	0.31	0.32	0.20	-0.91	Low
Bensenville	729	130274	1724298	0.08	0.11	0.01	0.03	-3.69	0.29	0.32	0.20	-0.91	Low

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Wood Dale	730	68172	982648	0.07	0.11	0.01	0.03	-3.69	0.29	0.32	0.20	-0.93	Low
Deerfield	731	56491	942768	0.06	0.06	0.00	0.01	-3.51	0.31	0.32	0.20	-0.93	Low
Oak Brook	732	178839	2104811	0.08	0.08	0.01	0.03	-3.69	0.29	0.32	0.20	-0.93	Low
Barrington	733	27934	858182	0.03	0.10	0.00	0.01	-3.51	0.31	0.32	0.20	-0.93	Low
Crete	734	6380	312155	0.02	0.02	0.00	0.00	-3.37	0.32	0.32	0.20	-0.93	Low
University Park	735	2577	191001	0.01	0.01	0.00	0.00	-3.37	0.32	0.32	0.20	-0.93	Low
Park Forest	736	616	18016	0.03	0.00	0.00	0.00	-3.37	0.32	0.32	0.20	-0.93	Low
Valmeyer	737	1555	55148	0.03	0.34	0.01	0.04	-3.83	0.28	0.32	0.20	-0.94	Low
Roanoke	738	2528	61318	0.04	0.11	0.00	0.02	-3.65	0.29	0.31	0.19	-0.96	Low
Palatine	739	52014	2253104	0.02	0.06	0.00	0.01	-3.51	0.31	0.31	0.19	-0.96	Low
Deer Park	740	6178	237237	0.03	0.03	0.00	0.00	-3.51	0.31	0.31	0.19	-0.97	Low
Arlington Heights	741	28081	1296150	0.02	0.02	0.00	0.00	-3.51	0.31	0.31	0.19	-0.98	Low
Channahon	742	87429	673045	0.13	0.22	0.03	0.11	-4.85	0.19	0.31	0.19	-0.98	Low
Eureka	743	9167	226941	0.04	0.07	0.00	0.01	-3.65	0.29	0.31	0.19	-0.99	Low
Roselle	744	49004	837603	0.06	0.06	0.00	0.01	-3.69	0.29	0.30	0.19	-0.99	Low
Elmhurst	745	60652	953081	0.06	0.05	0.00	0.01	-3.69	0.29	0.30	0.19	-1.00	Low
Chicago	746	949685	12607345	0.08	0.04	0.00	0.01	-3.69	0.29	0.30	0.19	-1.00	Low
Northlake	747	18865	613959	0.03	0.09	0.00	0.01	-3.69	0.29	0.30	0.19	-1.00	Low
Congerville	748	861	8834	0.10	0.02	0.00	0.01	-3.65	0.29	0.30	0.19	-1.00	Low
Burr Ridge	749	51010	1064800	0.05	0.05	0.00	0.01	-3.69	0.29	0.30	0.19	-1.01	Low
Hinsdale	750	43135	707079	0.06	0.03	0.00	0.01	-3.69	0.29	0.30	0.19	-1.02	Low
Brookport	751	1324	17803	0.07	0.03	0.00	0.01	-3.70	0.29	0.30	0.18	-1.02	Low
Hanover Park	752	17391	557431	0.03	0.05	0.00	0.01	-3.69	0.29	0.30	0.18	-1.02	Low
Schaumburg	753	151391	5017968	0.03	0.04	0.00	0.01	-3.69	0.29	0.30	0.18	-1.03	Low
Elk Grove Village	754	63360	1523853	0.04	0.03	0.00	0.01	-3.69	0.29	0.30	0.18	-1.03	Low
Kappa	755	158	2434	0.06	0.01	0.00	0.00	-3.65	0.29	0.30	0.18	-1.03	Low

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Waterloo	756	4117	172964	0.02	0.06	0.00	0.01	-3.83	0.28	0.28	0.18	-1.08	Low
Maple Park	757	1530	62845	0.02	0.22	0.01	0.02	-4.04	0.26	0.28	0.18	-1.09	Low
Maeystown	758	17	1058	0.02	0.04	0.00	0.00	-3.83	0.28	0.28	0.17	-1.09	Low
Elgin	759	203715	2860745	0.07	0.09	0.01	0.03	-4.14	0.25	0.28	0.17	-1.10	Low
Carbon Hill	760	270	13999	0.02	0.13	0.00	0.01	-3.96	0.27	0.28	0.17	-1.10	Low
Mazon	761	471	15965	0.03	0.09	0.00	0.01	-3.96	0.27	0.28	0.17	-1.10	Low
Gardner	762	571	26782	0.02	0.10	0.00	0.01	-3.96	0.27	0.28	0.17	-1.11	Low
Belvidere	763	36453	528377	0.07	0.18	0.01	0.05	-4.51	0.22	0.27	0.17	-1.13	Low
South Wilmington	764	191	5690	0.03	0.01	0.00	0.00	-3.96	0.27	0.27	0.17	-1.14	Low
Bartlett	765	36147	857633	0.04	0.07	0.00	0.01	-4.14	0.25	0.26	0.16	-1.16	Low
Woodridge	766	108809	1363500	0.08	0.08	0.01	0.03	-4.37	0.23	0.26	0.16	-1.19	Low
Manito	767	519	3671	0.14	0.02	0.00	0.01	-4.21	0.25	0.26	0.16	-1.20	Low
Channel Lake	768	18882	247772	0.08	0.52	0.04	0.16	-6.00	0.10	0.25	0.16	-1.21	Low
Lemont	769	22755	513797	0.04	0.11	0.00	0.02	-4.37	0.23	0.25	0.16	-1.21	Low
Poplar Grove	770	1251	30626	0.04	0.07	0.00	0.01	-4.51	0.22	0.23	0.14	-1.29	Low
Timberlane	771	214	14777	0.01	0.05	0.00	0.00	-4.51	0.22	0.22	0.14	-1.33	Low
Capron	772	260	21009	0.01	0.02	0.00	0.00	-4.51	0.22	0.22	0.14	-1.34	Low
Big Rock	773	12737	172496	0.07	0.14	0.01	0.04	-5.06	0.18	0.22	0.13	-1.36	Low
Coal City	774	548	16491	0.03	0.13	0.00	0.02	-4.85	0.19	0.21	0.13	-1.39	Low
Long Lake	775	19158	321483	0.06	0.48	0.03	0.11	-6.00	0.10	0.21	0.13	-1.40	Low
Virgil	776	1595	48889	0.03	0.23	0.01	0.03	-5.06	0.18	0.21	0.13	-1.41	Low
Pingree Grove	777	2823	58913	0.05	0.12	0.01	0.02	-5.06	0.18	0.20	0.12	-1.44	Low
Sleepy Hollow	778	3607	83419	0.04	0.13	0.01	0.02	-5.06	0.18	0.20	0.12	-1.45	Low
Diamond	779	234	14146	0.02	0.04	0.00	0.00	-4.85	0.19	0.20	0.12	-1.45	Low
Lake Catherine	780	7206	136799	0.05	0.48	0.03	0.10	-6.00	0.10	0.20	0.12	-1.45	Low
Prestbury	781	10093	262340	0.04	0.12	0.00	0.02	-5.06	0.18	0.19	0.12	-1.46	Low

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North Aurora	782	16598	351762	0.05	0.09	0.00	0.02	-5.06	0.18	0.19	0.12	-1.47	Low
South Elgin	783	29021	634241	0.05	0.08	0.00	0.02	-5.06	0.18	0.19	0.12	-1.47	Low
Carpentersville	784	27476	678675	0.04	0.07	0.00	0.01	-5.06	0.18	0.19	0.12	-1.49	Low
West Dundee	785	17362	390149	0.04	0.06	0.00	0.01	-5.06	0.18	0.19	0.12	-1.49	Low
Campton Hills	786	34988	1462423	0.02	0.10	0.00	0.01	-5.06	0.18	0.19	0.11	-1.50	Low
Hampshire	787	12799	372778	0.03	0.07	0.00	0.01	-5.06	0.18	0.19	0.11	-1.50	Low
Fox Lake Hills	788	10326	151209	0.07	0.32	0.02	0.09	-6.00	0.10	0.18	0.11	-1.50	Low
Sugar Grove	789	12270	418056	0.03	0.06	0.00	0.01	-5.06	0.18	0.18	0.11	-1.51	Low
Lily Lake	790	4378	146022	0.03	0.04	0.00	0.00	-5.06	0.18	0.18	0.11	-1.52	Low
Elburn	791	2316	107256	0.02	0.05	0.00	0.00	-5.06	0.18	0.18	0.11	-1.52	Low
Burlington	792	1177	68931	0.02	0.04	0.00	0.00	-5.06	0.18	0.18	0.11	-1.53	Low
Lincolnshire	793	218359	2103939	0.10	0.19	0.02	0.08	-6.00	0.10	0.18	0.11	-1.54	Low
Third Lake	794	6977	154192	0.05	0.42	0.02	0.08	-6.00	0.10	0.17	0.11	-1.55	Low
Round Lake Park	795	20160	243472	0.08	0.22	0.02	0.07	-6.00	0.10	0.17	0.10	-1.57	Low
Wilmington	796	32850	489983	0.07	0.16	0.01	0.04	-5.73	0.12	0.16	0.10	-1.59	Low
Shorewood	797	45537	593324	0.08	0.13	0.01	0.04	-5.73	0.12	0.16	0.10	-1.60	Low
Hainesville	798	11272	285518	0.04	0.39	0.02	0.06	-6.00	0.10	0.16	0.10	-1.61	Low
Minooka	799	23310	255721	0.09	0.07	0.01	0.03	-5.61	0.13	0.15	0.10	-1.63	Low
Venetian Village	800	8519	221408	0.04	0.37	0.01	0.06	-6.00	0.10	0.15	0.09	-1.63	Low
Mettawa	801	66212	901033	0.07	0.19	0.01	0.06	-6.00	0.10	0.15	0.09	-1.63	Low
Lakewood Shores	802	8307	156338	0.05	0.14	0.01	0.03	-5.73	0.12	0.15	0.09	-1.66	Low
Preston Heights	803	7542	138023	0.05	0.13	0.01	0.03	-5.73	0.12	0.15	0.09	-1.66	Low
Libertyville	804	148925	1837285	0.08	0.16	0.01	0.05	-6.00	0.10	0.15	0.09	-1.66	Low

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Winthrop Harbor	805	16169	347213	0.05	0.25	0.01	0.05	-6.00	0.10	0.14	0.09	-1.67	Low
Crest Hill	806	24872	410838	0.06	0.07	0.00	0.02	-5.73	0.12	0.14	0.08	-1.70	Low
Wauconda	807	45513	1019319	0.04	0.21	0.01	0.04	-6.00	0.10	0.13	0.08	-1.72	Low
St. Charles	808	49664	947241	0.05	0.05	0.00	0.01	-5.71	0.12	0.13	0.08	-1.72	Low
Forest Lake	809	5506	89827	0.06	0.14	0.01	0.03	-6.00	0.10	0.13	0.08	-1.73	Low
Geneva	810	16713	479889	0.03	0.07	0.00	0.01	-5.71	0.12	0.13	0.08	-1.73	Low
Wayne	811	6712	248014	0.03	0.09	0.00	0.01	-5.71	0.12	0.13	0.08	-1.73	Low
Peotone	812	3406	74123	0.05	0.06	0.00	0.01	-5.73	0.12	0.13	0.08	-1.73	Low
Romeoville	813	25992	1049360	0.02	0.12	0.00	0.01	-5.73	0.12	0.13	0.08	-1.73	Low
Grayslake	814	105228	1601269	0.07	0.13	0.01	0.03	-6.00	0.10	0.13	0.08	-1.73	Low
New Lenox	815	31567	828089	0.04	0.07	0.00	0.01	-5.73	0.12	0.13	0.08	-1.73	Low
Manhattan	816	5493	150070	0.04	0.07	0.00	0.01	-5.73	0.12	0.13	0.08	-1.74	Low
Round Lake	817	19348	436216	0.04	0.18	0.01	0.03	-6.00	0.10	0.13	0.08	-1.74	Low
Lisle	818	202874	2330308	0.09	0.17	0.02	0.06	-6.36	0.07	0.13	0.08	-1.75	Low
Batavia	819	32049	943149	0.03	0.04	0.00	0.01	-5.71	0.12	0.13	0.08	-1.75	Low
Lake Barrington	820	35671	1025190	0.03	0.21	0.01	0.03	-6.00	0.10	0.13	0.08	-1.75	Low
Elwood	821	1537	79896	0.02	0.08	0.00	0.01	-5.73	0.12	0.13	0.08	-1.75	Low
Crystal Lawns	822	1703	65811	0.03	0.06	0.00	0.01	-5.73	0.12	0.13	0.08	-1.75	Low
West Chicago	823	18404	942650	0.02	0.06	0.00	0.00	-5.71	0.12	0.13	0.08	-1.75	Low
Zion	824	30227	552769	0.05	0.13	0.01	0.03	-6.00	0.10	0.13	0.08	-1.75	Low
North Barrington	825	37078	1054196	0.04	0.21	0.01	0.03	-6.00	0.10	0.13	0.08	-1.75	Low
Fairmont	826	4804	121799	0.04	0.04	0.00	0.01	-5.73	0.12	0.13	0.08	-1.75	Low
Wadsworth	827	31926	509695	0.06	0.12	0.01	0.03	-6.00	0.10	0.13	0.08	-1.75	Low
Bolingbrook	828	121433	2316379	0.05	0.15	0.01	0.03	-6.05	0.09	0.12	0.08	-1.75	Low

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Round Lake Beach	829	45510	720441	0.06	0.11	0.01	0.03	-6.00	0.10	0.12	0.08	-1.76	Low
Beecher	830	4798	216859	0.02	0.05	0.00	0.00	-5.73	0.12	0.12	0.08	-1.76	Low
Vernon Hills	831	105093	1551957	0.07	0.10	0.01	0.03	-6.00	0.10	0.12	0.08	-1.76	Low
Park City	832	12757	301769	0.04	0.15	0.01	0.03	-6.00	0.10	0.12	0.08	-1.77	Low
Goofy Ridge	833	1567	16413	0.10	0.10	0.01	0.04	-6.16	0.08	0.12	0.07	-1.77	Low
Montgomery	834	37046	701552	0.05	0.16	0.01	0.03	-6.11	0.09	0.12	0.07	-1.77	Low
Tower Lakes	835	12187	372045	0.03	0.18	0.01	0.02	-6.00	0.10	0.12	0.07	-1.77	Low
Monee	836	1051	65109	0.02	0.01	0.00	0.00	-5.73	0.12	0.12	0.07	-1.77	Low
Volo	837	5128	109944	0.05	0.13	0.01	0.02	-6.00	0.10	0.12	0.07	-1.77	Low
Symerton	838	14	587	0.02	0.01	0.00	0.00	-5.73	0.12	0.12	0.07	-1.77	Low
Braidwood	839	224	39847	0.01	0.02	0.00	0.00	-5.73	0.12	0.12	0.07	-1.78	Low
Ingalls Park	840	401	9618	0.04	0.00	0.00	0.00	-5.73	0.12	0.12	0.07	-1.78	Low
Lake Villa	841	20960	764116	0.03	0.21	0.01	0.02	-6.00	0.10	0.12	0.07	-1.78	Low
Gages Lake	842	11536	138073	0.08	0.07	0.01	0.02	-6.00	0.10	0.12	0.07	-1.78	Low
Antioch	843	27879	763721	0.04	0.15	0.01	0.02	-6.00	0.10	0.12	0.07	-1.78	Low
Waukegan	844	106531	1613602	0.07	0.08	0.01	0.02	-6.00	0.10	0.12	0.07	-1.78	Low
Bannockburn	845	179761	2450292	0.07	0.07	0.01	0.02	-6.00	0.10	0.12	0.07	-1.79	Low
Gurnee	846	147440	2513901	0.06	0.08	0.00	0.02	-6.00	0.10	0.12	0.07	-1.79	Low
Long Grove	847	52445	1476623	0.04	0.13	0.00	0.02	-6.00	0.10	0.11	0.07	-1.80	Low
Round Lake Heights	848	9549	113667	0.08	0.05	0.00	0.02	-6.00	0.10	0.11	0.07	-1.80	Low
Kildeer	849	23627	862334	0.03	0.12	0.00	0.01	-6.00	0.10	0.11	0.07	-1.82	Low
Green Oaks	850	28537	582479	0.05	0.07	0.00	0.01	-6.00	0.10	0.11	0.07	-1.82	Low
Joliet	851	434367	3917483	0.11	0.11	0.01	0.05	-6.44	0.06	0.11	0.07	-1.82	Low
Beach Park	852	35698	777606	0.05	0.07	0.00	0.01	-6.00	0.10	0.11	0.07	-1.82	Low
Lake Forest	853	48645	1307750	0.04	0.08	0.00	0.01	-6.00	0.10	0.11	0.07	-1.82	Low

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Hawthorn Woods	854	31821	1042601	0.03	0.09	0.00	0.01	-6.00	0.10	0.11	0.07	-1.83	Low
Naperville	855	337231	7921253	0.04	0.09	0.00	0.01	-6.05	0.09	0.11	0.07	-1.83	Low
Aurora	856	258203	4894371	0.05	0.08	0.00	0.02	-6.08	0.09	0.11	0.07	-1.83	Low
Mundelein	857	68189	1882025	0.04	0.07	0.00	0.01	-6.00	0.10	0.11	0.07	-1.83	Low
Lake Bluff	858	15071	408422	0.04	0.07	0.00	0.01	-6.00	0.10	0.11	0.07	-1.83	Low
Lake Zurich	859	36785	1485270	0.02	0.09	0.00	0.01	-6.00	0.10	0.11	0.06	-1.84	Low
Lindenhurst	860	8490	328995	0.03	0.09	0.00	0.01	-6.00	0.10	0.11	0.06	-1.84	Low
North Chicago	861	33396	996385	0.03	0.07	0.00	0.01	-6.00	0.10	0.11	0.06	-1.84	Low
Old Mill Creek	862	3523	132058	0.03	0.08	0.00	0.01	-6.00	0.10	0.10	0.06	-1.84	Low
Grandwood Park	863	4269	275998	0.02	0.06	0.00	0.00	-6.00	0.10	0.10	0.06	-1.86	Low
Yorkville	864	26538	459762	0.06	0.02	0.00	0.00	-6.11	0.09	0.09	0.06	-1.89	Low
Oakbrook Terrace	865	37414	421210	0.09	0.07	0.01	0.03	-6.36	0.07	0.09	0.06	-1.89	Low
Plainfield	866	56731	1144500	0.05	0.16	0.01	0.03	-6.44	0.06	0.09	0.06	-1.90	Low
Warrenville	867	74368	1404432	0.05	0.11	0.01	0.02	-6.36	0.07	0.09	0.06	-1.90	Low
Villa Park	868	77401	667960	0.12	0.05	0.01	0.02	-6.36	0.07	0.09	0.05	-1.90	Low
Carol Stream	869	102355	2197329	0.05	0.11	0.00	0.02	-6.36	0.07	0.09	0.05	-1.92	Low
Willowbrook	870	55272	885420	0.06	0.08	0.00	0.02	-6.36	0.07	0.09	0.05	-1.92	Low
Forest City	871	59	3141	0.02	0.04	0.00	0.00	-6.16	0.08	0.09	0.05	-1.92	Low
Winfield	872	29534	600100	0.05	0.10	0.00	0.02	-6.36	0.07	0.09	0.05	-1.92	Low
Lombard	873	72797	1020175	0.07	0.07	0.00	0.02	-6.36	0.07	0.08	0.05	-1.92	Low
Mason City	874	59	13506	0.00	0.01	0.00	0.00	-6.16	0.08	0.08	0.05	-1.93	Low
Downers Grove	875	203825	3516606	0.06	0.07	0.00	0.02	-6.36	0.07	0.08	0.05	-1.94	Low
Darien	876	80237	1363344	0.06	0.06	0.00	0.01	-6.36	0.07	0.08	0.05	-1.95	Low
Willowbrook	877	15168	317149	0.05	0.07	0.00	0.01	-3.37	0.07	0.08	0.05	-1.95	Low

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Floodplain Area Weighting Factor	Weighted Flood Loss Ratio	Loss Index	SoVI Score	SoVI Index	Flood Score	Flood Vulnerability Index	z-score	Flood Vulnerability Rating
Bloomingdale	878	79112	1724656	0.05	0.07	0.00	0.01	-6.36	0.07	0.08	0.05	-1.95	Low
Addison	879	71157	1442344	0.05	0.06	0.00	0.01	-6.36	0.07	0.08	0.05	-1.95	Low
Glendale Heights	880	57180	1461233	0.04	0.06	0.00	0.01	-6.36	0.07	0.07	0.05	-1.97	Low
Wheaton	881	61337	1512898	0.04	0.04	0.00	0.01	-6.36	0.07	0.07	0.04	-1.97	Low
Glen Ellyn	882	19471	371128	0.05	0.03	0.00	0.01	-6.36	0.07	0.07	0.04	-1.97	Low
Westmont	883	31302	825724	0.04	0.03	0.00	0.00	-6.36	0.07	0.07	0.04	-1.98	Low
Clarendon Hills	884	13218	206925	0.06	0.01	0.00	0.00	-6.36	0.07	0.07	0.04	-1.99	Low
Oswego	885	34304	554991	0.06	0.07	0.00	0.02	-7.15	0.00	0.02	0.01	-2.21	Low
Plano	886	8816	118178	0.07	0.05	0.00	0.02	-7.15	0.00	0.02	0.01	-2.22	Low
Plattville	887	622	29898	0.02	0.18	0.00	0.01	-7.15	0.00	0.01	0.01	-2.22	Low
Lisbon	888	1105	38626	0.03	0.11	0.00	0.01	-7.15	0.00	0.01	0.01	-2.23	Low
Millbrook	889	577	13323	0.04	0.03	0.00	0.00	-7.15	0.00	0.00	0.00	-2.26	Low
Newark	890	939	58029	0.02	0.04	0.00	0.00	-7.15	0.00	0.00	0.00	-2.27	Low
Boulder Hill	891	3857	75346	0.05	0.01	0.00	0.00	-7.15	0.00	0.00	0.00	-2.28	Low

Appendix E – Jurisdictional Flood-Exposure, -Loss, and -Vulnerability Results for the Levees Fail Scenarios

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	Floodplain Area Index	SoVI Score	SoVI Index	Levee Safety Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Mound City	1	13772	32661	0.42	1.00	0.99	1.59	0.63	0.33	2.95	1.00	2.27	High
Cairo	2	79023	447935	0.18	0.40	0.99	4.75	1.00	0.33	2.73	0.91	1.86	High
Sauget	3	140104	588351	0.24	0.55	1.00	1.68	0.64	0.33	2.52	0.83	1.48	High
Fairmont City	4	49187	215179	0.23	0.53	1.00	1.68	0.64	0.33	2.50	0.82	1.44	High
Madison	5	117252	735051	0.16	0.36	1.00	1.68	0.64	0.33	2.33	0.76	1.12	High
Mounds	6	16790	70373	0.24	0.55	0.78	1.59	0.63	0.33	2.29	0.74	1.05	High
Brooklyn	7	6705	52431	0.13	0.28	0.99	1.68	0.64	0.33	2.24	0.72	0.96	Elevated
Venice	8	52721	300901	0.18	0.40	1.00	-0	0.44	0.33	2.16	0.69	0.82	Elevated
East St. Louis	9	282232	2755685	0.10	0.22	0.97	1.68	0.64	0.33	2.16	0.69	0.81	Elevated
East Carondelet	10	3952	25681	0.15	0.35	1.00	1.68	0.64	0.17	2.14	0.68	0.78	Elevated
Washington Park	11	36813	442926	0.08	0.17	1.00	1.68	0.64	0.33	2.14	0.68	0.78	Elevated
Alorton	12	19290	290334	0.07	0.13	1.00	1.68	0.64	0.33	2.10	0.67	0.71	Elevated
Centreville	13	40824	548886	0.07	0.15	0.97	1.68	0.64	0.33	2.09	0.66	0.68	Elevated
East Alton	14	198632	645940	0.31	0.72	0.73	-0	0.44	0.17	2.05	0.65	0.61	Elevated
Pontoon Beach	15	94420	773112	0.12	0.27	1.00	-0	0.44	0.33	2.04	0.64	0.59	Elevated
Prairie du Rocher	16	13810	66295	0.21	0.48	0.83	0.88	0.54	0.17	2.02	0.64	0.56	Elevated
Cahokia	17	125837	1372480	0.09	0.19	1.00	1.68	0.64	0.17	2.00	0.63	0.51	Elevated
Dupo	18	55373	476165	0.12	0.25	0.92	1.68	0.64	0.17	1.98	0.62	0.48	Average
Granite City	19	380798	3984201	0.10	0.20	1.00	-0	0.44	0.33	1.97	0.62	0.47	Average
Mitchell	20	9930	133522	0.07	0.15	1.00	-0	0.44	0.33	1.92	0.60	0.37	Average
Hartford	21	15849	123980	0.13	0.28	1.00	-0	0.44	0.17	1.88	0.58	0.30	Average
Rosiclare	22	12852	53684	0.24	0.55	0.25	3.91	0.90	0.17	1.87	0.58	0.28	Average
Brookport	23	22364	104126	0.21	0.49	1.00	-3.7	0.00	0.33	1.83	0.56	0.20	Average
Collinsville	24	172400	889822	0.19	0.44	0.41	1.68	0.64	0.33	1.83	0.56	0.20	Average
South Roxana	25	14226	146188	0.10	0.21	1.00	-0	0.44	0.17	1.81	0.55	0.17	Average
Caseyville	26	47826	477856	0.10	0.21	0.61	1.68	0.64	0.33	1.79	0.55	0.13	Average
Hull	27	27	1714	0.02	0.01	1.00	1.43	0.61	0.17	1.78	0.54	0.12	Average

Town/City	Rank	Total Losses ($Thousands)	Total Exposure ($Thousands)	Loss Ratio	Loss Index	Floodplain Area Index	SoVI Score	SoVI Index	Levee Safety Index	Flood Score	Flood Vulnerability Index	Z Score	Flood Vulnerability Rating
Roxana	28	46614	330065	0.14	0.31	0.85	-0	0.44	0.17	1.77	0.54	0.09	Average
Golconda	29	8806	51012	0.17	0.39	0.27	4.11	0.92	0.17	1.75	0.53	0.06	Average
New Athens	30	18539	95163	0.19	0.45	0.45	1.68	0.64	0.17	1.70	0.51	-0.04	Average
Wood River	31	141050	1085939	0.13	0.29	0.79	-0	0.44	0.17	1.68	0.50	-0.08	Average
Beardstown	32	96735	596147	0.16	0.37	0.75	-0.6	0.36	0.17	1.64	0.49	-0.14	Average
Fulton	33	60417	336342	0.18	0.41	0.58	-0.4	0.39	0.17	1.55	0.45	-0.31	Average
Milan	34	198222	910668	0.22	0.50	0.50	-0.6	0.36	0.17	1.54	0.45	-0.34	Average
New Canton	35	53	4133	0.01	0.00	0.74	1.43	0.61	0.17	1.52	0.44	-0.37	Average
Columbia	36	40357	349101	0.12	0.25	0.37	1.68	0.64	0.17	1.42	0.40	-0.54	Low
East Moline	37	136188	878160	0.16	0.35	0.54	-0.6	0.36	0.17	1.41	0.40	-0.56	Low
East Peoria	38	262134	1339751	0.20	0.45	0.29	-1.6	0.25	0.33	1.32	0.36	-0.72	Low
Rock Island	39	375380	1945704	0.19	0.44	0.27	-0.6	0.36	0.17	1.24	0.33	-0.89	Low
Alton	40	81295	447550	0.18	0.41	0.21	-0	0.44	0.17	1.22	0.32	-0.91	Low
Edwardsville	41	14806	444786	0.03	0.05	0.31	-0	0.44	0.33	1.12	0.29	-1.09	Low
Glen Carbon	42	7646	141969	0.05	0.10	0.23	-0	0.44	0.33	1.10	0.27	-1.15	Low
Galena	43	62928	325605	0.19	0.44	0.10	-0.9	0.33	0.17	1.04	0.25	-1.25	Low
Mount Carmel	44	20853	176728	0.12	0.26	0.18	-0.1	0.42	0.17	1.02	0.25	-1.28	Low
Harrisburg	45	66519	639258	0.10	0.22	0.43	-2.1	0.19	0.17	1.01	0.24	-1.31	Low
Maryville	46	2135	63494	0.03	0.05	0.15	-0	0.44	0.33	0.97	0.23	-1.37	Low
Kinderhook	47	23	557	0.04	0.07	0.07	1.43	0.61	0.17	0.91	0.20	-1.49	Low
Rosewood Heights	48	7316	87221	0.08	0.17	0.00	-0	0.44	0.17	0.78	0.15	-1.74	Low
Bethalto	49	4856	150569	0.03	0.05	0.05	-0	0.44	0.17	0.70	0.12	-1.88	Low
DeKalb	50	47843	750252	0.06	0.12	0.02	-3	0.08	0.17	0.39	0.00	-2.44	Low