Winnebago Countywide Multi-Hazard Mitigation Plan

December 21, 2007

Prepared for:

Cherry Valley, Village of
Durand, Village of
Loves Park, City of
Machesney Park, Village of
New Millford, Village of
Pecatonica, Village of
Rockford, City of
Rockton, Village of
Roscoe, Village of
South Beloit, City of
Winnebago, Village of
Winnebago County

In Partnership with:

ILLINOIS EMERGENCY MANAGEMENT AGENCY

FEMA

Fuller, Mossbarger, Scott and May Engineers, Inc.

Local Mitigation Plan Review and Approval Status

Jurisdiction: Winnebago County	**Title of Plan:** Winnebago Countywide Multi-Hazard Mitigation Plan	**Date of Plan:** 12/21/2007
Local Point of Contact: Joseph Vanderwerff, Sr., PE	**Address:** Winnebago County Highway Department 424 North Springfield Avenue Rockford, IL 61101	
Title: County Engineer		
Agency: Winnebago County Highway Department		
Phone Number: (815) 319-4000	**E-Mail:** jvanderwerff@co.winnebago.il.us	

State Reviewer:	**Title:**	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region [Insert #]		
Plan Not Approved		
Plan Approved		
Date Approved		

Jurisdiction:	**NFIP Status***			
	Y	**N**	**N/A**	**CRS Class**
1. Cherry Valley, Village of				
2. Durand, Village of				
3. Loves Park, City of				
4. Machesney Park, Village of				
5. [ATTACH PAGE(S) WITH ADDITIONAL JURISDICTIONS]				

*** Notes:** **Y = Participating** **N = Not Participating** **N/A = Not Mapped**

Multi-jurisdiction: ☐ YES ☐ NO (If yes, list each jurisdiction below:)	**N/A***	**NFIP Status (for mapped communities)**	
5. New Millford, Village of	☐	Participating ☐	Non-Participating ☐
6. Pecatonica, Village of	☐	Participating ☐	Non-Participating ☐
7. Rockford, City of	☐	Participating ☐	Non-Participating ☐
8. Rockton, Village of	☐	Participating ☐	Non-Participating ☐
9. Roscoe, Village of	☐	Participating ☐	Non-Participating ☐
10. South Beloit, City of	☐	Participating ☐	Non-Participating ☐
11. Winnebago County, Village of	☐	Participating ☐	Non-Participating ☐
12. Winnebago County	☐	Participating ☐	Non-Participating ☐

LOCAL MITIGATION PLAN REVIEW SUMMARY

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(s) (Check Applicable Box)	**NOT MET**	**MET**
Adoption by the Local Governing Body: §201.6(c)(5) **OR**		
Multi-Jurisdictional Plan Adoption: §201.6(c)(5) **AND**		
Multi-Jurisdictional Planning Participation: §201.6(a)(3)		

Planning Process	**N**	**S**
Documentation of the Planning Process: §201.6(b) and §201.6(c)(1)		

Risk Assessment	**N**	**S**
Identifying Hazards: §201.6(c)(2)(i)		
Profiling Hazards: §201.6(c)(2)(i)		
Assessing Vulnerability: Overview: §201.6(c)(2)(ii)		
Assessing Vulnerability: Identifying Structures: §201.6(c)(2)(ii)(A)		
Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)		
Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)		
Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii)		

Mitigation Strategy	**N**	**S**
Local Hazard Mitigation Goals: §201.6(c)(3)(i)		
Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii)		
Implementation of Mitigation Actions: §201.6(c)(3)(iii)		
Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv)		

Plan Maintenance Process	**N**	**S**
Monitoring, Evaluating, and Updating the Plan: §201.6(c)(4)(i)		
Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)		
Continued Public Involvement: §201.6(c)(4)(iii)		

Additional State Requirements*	**N**	**S**
Insert State Requirement		
Insert State Requirement		
Insert State Requirement		

LOCAL MITIGATION PLAN APPROVAL STATUS

PLAN NOT APPROVED ☐

PLAN APPROVED ☐

*States that have additional requirements can add them in the appropriate sections of the *Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements.

See Reviewer's Comments

PREREQUISITE(S)

Adoption by the Local Governing Body

***Requirement §201.6(c)(5)*:** *[The local hazard mitigation plan **shall** include] documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council).*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Has the local governing body adopted the plan?	Section 1.1			
B. Is supporting documentation, such as a resolution, included?	Appendix A			
		SUMMARY SCORE		

Multi-Jurisdictional Plan Adoption

***Requirement §201.6(c)(5)*:** *For multi-jurisdictional plans, each jurisdiction requesting approval of the plan **must** document that it has been formally adopted.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the plan indicate the specific jurisdictions represented in the plan?	Section 1.1			
B. For each jurisdiction, has the local governing body adopted the plan?	Section 1.1			
C. Is supporting documentation, such as a resolution, included for each participating jurisdiction?	Appendix A			
		SUMMARY SCORE		

Multi-Jurisdictional Planning Participation

***Requirement §201.6(a)(3)*:** *Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process … Statewide plans will not be accepted as multi-jurisdictional plans.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE NOT MET	SCORE MET
A. Does the plan describe **how** each jurisdiction participated in the plan's development?	Section 1.2			
		SUMMARY SCORE		

PLANNING PROCESS: *§201.6(b): An open public involvement process is essential to the development of an effective plan.*

Documentation of the Planning Process

Requirement §201.6(b): *In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process* ***shall*** *include:*
(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
(2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and
(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Requirement §201.6(c)(1): *[The plan* ***shall*** *document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

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 the process followed to prepare the plan?	Section 2.1			
B. Does the plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)	Section 2.2			
C. Does the plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	Section 2.3			
D. Was there an opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	Section 2.3			
E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	Section 2.4			
		SUMMARY SCORE		

RISK ASSESSMENT: *§201.6(c)(2): The plan shall include a risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.*

Identifying Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the type … of all natural hazards that can affect the jurisdiction.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan include **a description** of the types of **all natural hazards** that affect the jurisdiction? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the jurisdiction, this part of the plan cannot receive a Satisfactory score. Consult with the State Hazard Mitigation Officer to identify applicable hazards that may occur in the planning area.	Section 3.1.1 Section 3.1.2 and subsections			
		SUMMARY SCORE		

Profiling Hazards

Requirement §201.6(c)(2)(i): *[The risk assessment **shall** include a] description of the … location and extent of all natural hazards that can affect the jurisdiction. The plan **shall** include information on previous occurrences of hazard events and on the probability of future hazard events.*

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 hazard addressed in the plan?	Section 3.2.2 and subsections			
B. Does the risk assessment identify the **extent** (i.e., magnitude or severity) of each hazard addressed in the plan?	Section 3.2.2 and subsections			
C. Does the plan provide information on **previous occurrences** of each hazard addressed in the plan?	Section 3.2.2 Appendix G			
D. Does the plan include the **probability of future events** (i.e., chance of occurrence) for each hazard addressed in the plan?	Section 3.3.2 and subsections			
		SUMMARY SCORE		

Assessing Vulnerability: Overview

Requirement §201.6(c)(2)(ii): *[The risk assessment **shall** include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description **shall** include an overall summary of each hazard and its impact on the community.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan include an **overall summary** description of the jurisdiction's **vulnerability** to each hazard?	Section 3.3.1			
B. Does the plan address the **impact** of each hazard on the jurisdiction?	Section 3.3.2			
		SUMMARY SCORE		

Assessing Vulnerability: Identifying Structures

Requirement §201.6(c)(2)(ii)(A): *The plan **should** describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan describe vulnerability in terms of the **types and numbers** of **existing** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 3.3.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
B. Does the plan describe vulnerability in terms of the **types and numbers** of **future** buildings, infrastructure, and critical facilities located in the identified hazard areas?	Section 3.3.4 Appendix H	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

Assessing Vulnerability: Estimating Potential Losses

Requirement §201.6(c)(2)(ii)(B): *[The plan **should** describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate … .*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan estimate **potential dollar losses** to vulnerable structures?	Section 3.3.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
B. Does the plan describe the **methodology** used to prepare the estimate?	Section 3.3.4	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

Assessing Vulnerability: Analyzing Development Trends

Requirement §201.6(c)(2)(ii)(C): *[The plan **should** describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan describe land uses and development trends?	Section 3.3.5 Appendix H	***Note: A "Needs Improvement" score on this requirement will not preclude the plan from passing.***		
		SUMMARY SCORE		

Multi-Jurisdictional Risk Assessment

Requirement §201.6(c)(2)(iii): *For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	Section 3.3.1			
		SUMMARY SCORE		

MITIGATION STRATEGY: *§201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.*

Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): *[The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards? (**GOALS** are long-term; represent what the community wants to achieve, such as "eliminate flood damage"; and are based on the risk assessment findings.)	Section 4.2 Appendix J			
		SUMMARY SCORE		

Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): *[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?	Section 4.3, 4.4, and 4.5			
B Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?	Section 4.3, 4.4, and 4.5			
C. Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?	Section 4.3, 4.4, and 4.5			
		SUMMARY SCORE		

Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): *[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)	Section 4.3, 4.4, and 4.5			
B. Does the mitigation strategy address how the actions will be **implemented and administered**? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)	Section 4.3, 4.4, and 4.5			
C. Does the prioritization process include an emphasis on the use of a **cost-benefit review** (see page 3-36 of *Multi-Hazard Mitigation Planning Guidance*) to maximize benefits?	Section 4.3, 4.4, and 4.5			
		SUMMARY SCORE		

Multi-Jurisdictional Mitigation Actions

Requirement §201.6(c)(3)(iv): *For multi-jurisdictional plans, there* ***must*** *be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A Does the plan include at least one identifiable **action item** for each jurisdiction requesting FEMA approval of the plan?	Section 4.5			
		SUMMARY SCORE		

PLAN MAINTENANCE PROCESS

Monitoring, Evaluating, and Updating the Plan

Requirement §201.6(c)(4)(i): *[The plan maintenance process* ***shall*** *include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan describe the method and schedule for **monitoring** the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)	Section 5.1			
B. Does the plan describe the method and schedule for **evaluating** the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)	Section 5.1			
C. Does the plan describe the method and schedule for **updating** the plan within the five-year cycle?	Section 5.1			
		SUMMARY SCORE		

Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): *[The plan **shall** include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?	Section 5.2 Section 4.6			
B. Does the plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?	Section 4.6			
		SUMMARY SCORE		

Continued Public Involvement

Requirement §201.6(c)(4)(iii): *[The plan maintenance process **shall** include a] discussion on how the community will continue public participation in the plan maintenance process.*

Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE N	SCORE S
A. Does the plan explain how **continued public participation** will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Section 5.3			
		SUMMARY SCORE		

Winnebago Countywide Multi-Hazard Mitigation Plan

Winnebago County, Illinois

Prepared for:

Winnebago County, Illinois

December 21, 2007

Winnebago Countywide
Multi-Hazard Mitigation Plan

Winnebago County, Illinois

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Winnebago Countywide
Multi-Hazard Mitigation Plan

Winnebago County, Illinois

1. Prerequisites

1.1. Adoption by the Local Governing Body

The Winnebago Countywide Multi-Hazard Mitigation Plan, hereafter known as "the Plan" adheres to the guidelines outlined in 44 CFR, Section 201.6.

As the Plan's Administrator, the Winnebago County submitted the Plan to the Illinois Emergency Management Agency (IEMA) and the Federal Emergency Management Agency (FEMA) Region V for review and comment. Once the state and federal reviewers certify the Plan approvable, Winnebago County will forward the Plan to each participating jurisdiction for formal adoption. A signed copy of the executed order will be included in Appendix A of the Plan.

The following jurisdictions are represented by the Plan.

Table 1. Jurisdiction Represented by the Plan

Community	FEMA Community ID	Adoption Date
Cherry Valley, Village of	170721	
Durand, Village of	170789	
Loves Park, City of	170722	
Machesney Park, Village of	171009	
New Millford, Village of	175182	
Pecatonica, Village of	170797	
Rockford, City of	170723	
Rockton, Village of	170774	
Roscoe, Village of	170724	
South Beloit, City of	170725	
Winnebago, Village of	175183	
Winnebago, County	170720	

1.2. Jurisdiction Participation

At the start of the planning process, a Planning Team was formed, which included representation from each jurisdiction within Winnebago County. Together the team developed a mission statement that they felt best described the Multi-Hazard Mitigation Plan. The mission statement is:

> *"Winnebago County's mitigation plan mission is to protect life, property, and the environment through coordination and cooperation, which will reduce risk and loss, and enhance the quality of life for the people of Winnebago County."*

Community participation was also defined by the Planning Team during the planning process. Collectively it was decided that each jurisdiction must meet the following criteria to be included within the Plan.

a. Provide representation during at least two planning meetings,

b. Submit an inventory of plans, data, and reports relevant to hazard mitigation planning,

c. Review and complete the Multi-Hazard Mitigation Survey at http://gis.fmsm.com/hazplan/

d. Identify critical "at risk" structures and facilities,

e. Develop community wide mitigation goals,

f. Submit a prioritized list of mitigation activities,

g. Review and comment on the draft plan,

h. Incorporate the plan into existing planning efforts,

i. Formally adopt the plan, and

j. Participate in plan maintenance through yearly reviews and five year updates.

All jurisdictions in Winnebago County met the definition of a participant.

2. Planning Process

The Winnebago Countywide Hazard Mitigation Plan is developed as a multi-hazard, multi-jurisdictional plan for the communities within Winnebago County, Illinois. The Winnebago County Highway Department served as the Plan's administrator and is the primary point of contact for the Plan.

2.1. Description of the Planning Process

The process used to develop the Plan was based upon FEMA's 386-8 Multi-Jurisdictional Planning document. Specifically, the planning process focused upon soliciting comprehensive feedback from stakeholders and the general public through meetings, open houses, interactive questionnaires, and document comment forms.

Phases of the planning effort were consistent with the original Scope of Work included in the Fiscal Year 2007 Pre-Disaster Mitigation Planning grant application (Appendix B), and compliant to FEMA recommended approaches including:

a. Focusing toward including all jurisdictions within the County,

b. Forming a multi-tiered planning team with clearly defined roles and responsibilities,

c. Providing opportunities for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process;

d. Providing extensive public outreach and opportunities for involvement,

e. Reviewing and incorporating existing plans, studies, reports, and technical information, as appropriate;

f. Conducting thorough hazard profiling and comprehensive risk assessment,

g. Developing mitigation goals and actions prioritized for each community,

h. Providing opportunities for the public to comment on the plan during the drafting stage and prior to plan approval; and

i. Developing plan maintenance procedures that keep the plan up to date.

The planning process followed a timeline for each step in developing the Plan. A copy of this timeline is provided in Appendix C of the Plan.

2.2. The Planning Team

The Winnebago County planning process was designed to maximize stakeholder involvement and participation to create a viable plan complete with risk identification and risk mitigation strategies. Public involvement was an integral part of the development of the Plan and provides access to a broader cross section of public and county residents. The planning process, however primarily relied on stakeholder involvement and participation guidance throughout all phases of the Plan. The majority of this involvement was comprised from two stakeholder groups: a Planning Committee that includes a single point of contact or representative from each participating jurisdiction, and an Advisory Group which comprised a group of representatives from other agencies, government, businesses, academia, and others interested in hazard mitigation.

A planning consultant was also contracted by the Winnebago County to facilitate the Plan's development and to perform analysis, mapping, and document support.

Together, the Planning Team was represented by the following groups:

- Chief Elected Officials. Consisted of the County's senior leadership for each participating jurisdiction including the County Chairman, City Mayors, and Village Presidents. This group authorized and committed the necessary resources and personnel to ensure that each jurisdiction was properly represented and met the participation requirements.

- Planning Committee. Consisted of one person as the primary point of contact from each jurisdiction responsible for collecting data, reviewing plans/studies, facilitating public input, developing mitigation goals and actions for each of their jurisdictions, and helping in drafting the Plan. The Planning Committee was also responsible for coordinating future plan maintenance including yearly reviews and five-year updates.

- Advisory Group. Composed of agencies/organizations from local entities, as well as community representatives, local business leaders, and educators interested in hazard mitigation. This group is responsible for providing historical data and reviewing the draft Plan.

- Plan Consultant. FMSM Engineers was responsible for facilitating Plan development, analysis, mapping, and document preparation support.

Tables 2, 3, 4 and 5 detail individual planning team members and the public stakeholder meeting, attended.

Table 2. Chief Elected Officials

Representative	Jurisdiction
Chairman Scott H. Christiansen	County of Winnebago
President James E. Claeyssen	Village of Cherry Valley
President Gary L. Haughton	Village of Durand
President Linda M. Vaughn	Village of Machesney Park
President Bonnie Beard	Village of New Milford
President Daniel R. Mathews	Village of Pecatonica
President Dale Adams	Village of Rockton

Table 3. Planning Committee Members and Meeting Participation

Jurisdiction	Representative	October 9, 2007	November 8, 2007
Village of Cherry Valley	David Nord	X	X[a]
Village of Durand	Gary Haughton	X	X[b]
City of Loves Park	Dan Jacobson	X	X
Village of Machesney Park	Chad Atkinson	X	X
Village of New Millford	Bonnie Beard	X	X
Village of Pecatonica	Pat McNamer	X	X
City of Rockford	Brian Eber	X	X
Village of Rockton	Gordy Nygren	X	X
Village of Roscoe	Sharon Atkins	X	X
City of South Beloit	Marilyn Hartley	X	X
Village of Winnebago	Stephen Butler	X	X[c]
Winnebago County	Dave Townsend	X	X

[a]: Village of Cherry Valley sent representation through another community contact. That contact was Joe Caveny who is also an advisory group member.
[b]: Village of Durand sent representation through another community contact. The contact was Robert Corwin who is also an advisory group member.
[c]: Village of Winnebago sent representation through another community contact. That contact was Jeff White who is also and advisory group member.

Table 4. Advisory Group Members and Meeting Participation

Agency	Representative	October 9, 2007	November 8, 2007
Village of Cherry Valley	Joe Caveny	X	X
Village of Durand	Robert Corwin		X
Village of Machesney Park	Linda Vaughn	X	
Village of Rockton	Dale Adams		X
Village of Rockton	Dennis McMullen	X	
Village of Roscoe	Gary Ballard	X	
City of Rockford	John Paul Diipla	X	X
City of Rockford	Jonah Katz	X	X
City of Rockford	Lawrence Morrissey	X	X
City of Rockford	Marcy Leach		X
Village of Winnebago	Jeff White		X
Winnebago County	Allen Zais	X	
Winnebago County	Joe Vanderwerff	X	X
Winnebago County	Todd Stockbarger	X	
Winnebago County	Rob Martin	X	
Winnebago County	Burnie Turner	X	X
Winnebago County	Scott Christiansen	X	
Winnebago County	Dennis Lolli		X
Winnebago County	Dina Getty		X
Winnebago County	Angela Wood-Zuzevich		X

Table 5. Planning Consultant and Meeting Participation

Consultant	Representative	October 9, 2007	November 8, 2007
Mike Anderson	FMSM Engineers	X	X
John Malueg	FMSM Engineers	X	

2.3. Public Involvement

The Winnebago County planning process was designed to maximize public participation. Public participation, for the purpose of the Plan, is defined as an opportunity for each jurisdiction and the citizens of that community to participate in the planning process. Opportunities for public participation were offered through multiple public stakeholder meetings, multiple public informational meetings, one-on-one interviews, phone interviews, a publicly available multi-media website, a multi-hazard questionnaire, and additional future plan maintenance opportunities.

Opportunities for the public to participate were provided in the following ways:

a. Planning Team stakeholder meetings were open to the public;

b. Open public meetings were held to inform the public of the planning process and to request participation;

c. A Multi-Hazard questionnaire was placed online allowing the public to participate in the Plan and give their additional feedback for possible Plan inclusion.

d. Draft Plan text and supporting information were made available via the website for public input and review.

e. Public opportunities for review of the final Plan; and

f. Placement of the draft Plan at executive offices as well as public libraries and other government centers.

The Planning Team worked together to incorporate relevant feedback from the public into all phases of Plan development.

2.3.1. Public Stakeholder Meetings

Two public stakeholder meetings were held during the development of the Plan. The first was a Stakeholder Kickoff Meeting, and the second was a Stakeholder Hazard Assessment and Mitigation Activities Meeting. Both meetings were publicized through local newspaper announcements and a web link from the County's government homepage.

Table 6. Stakeholder Meetings Scheduled

Year	Date	Purpose of Meeting	Location
2007	10/09/07	Stakeholder Kickoff Meeting, Data Collection	Winnebago County Administration Building, Rockford Illinois
2007	11/08/07	Stakeholder Hazard Assessment and Mitigation Activities	Winnebago County Administration Building, Rockford Illinois

The Stakeholder Kickoff Meeting held on October 9, 2007, included a presentation to inform community representatives about the hazard mitigation planning process and the benefits for each jurisdiction. During this meeting, the Planning Team (Planning Committee and Advisory Group) was estabilished along with a definition for critical facilities and a mission statement for the Plan. The roles and responsibilities of both the Planning Committee members and the Advisory Group were defined. Mr. David Townsend of the Winnebago County Highway Department was identified as the Plan's primary point of contact for public input or questions. Mr. Townsend was also the primary contact between the County and the Plan's consultant, FMSM Engineers.

The Stakeholder Hazard Assessment and Mitigation Activities Meeting held on November 8, 2007, included a presentation sharing the results of the hazard identification surveys, hazard profiles, and hazard assessments. During this meeting, participants were encouraged to define mitigation goals and consider mitigation actions in a manner that weighted priority, funding, and mitigation methodology.

The Planning Team provided guidance throughout both meetings and shared ideas for maximizing stakeholder input. Attendance for each of the stakeholder meetings is provided in Tables 3 and 4. Minutes for each meeting were kept by FMSM Engineers and made available to the public. They are also provided in Appendix D of this Plan.

2.3.2. Public Open Houses

Two public open houses were held during the development of the Plan. The first was a Public Kickoff Meeting and the second was a Public Hazard Assessment and Mitigation Activities Meeting. Both meetings were publicized through local newspaper announcements and a web link from the County's government homepage.

Table 7. Public Open House Meetings Scheduled

Year	Date	Purpose of Meeting	Location
2007	10/09/07	Public Kickoff Meeting, Data Collection	Memorial Hall Auditorium Rockford Illinois
2007	11/08/07	Public Hazard Assessment and Mitigation Activities	City Council Chambers, Rockford Illinois

Source: National Oceanic and Atmospheric Association (NOAA)

The Public Kickoff Meeting held on October 9, 2007, provided an opportunity to inform the public about the hazard mitigation planning process and the benefits for county residents. The focus of the meeting was to introduce the planning process, request assistance from the public/private sector and citizens, and collect hazard data. Mr. Joe Vanderwerff, a representative from the Winnebago County Highway Department, hosted the public meeting and was interviewed by local Rockford Channel 13 NBC news. While the meeting's attendance was low, the interview was well received and generated significant traffic to the County's Hazard Mitigation website.

The Public Hazard Assessment and Mitigation Activities Meeting held on November 8, 2007, provided an opportunity to inform the public about the hazard mitigation process and the benefits for county residents. The focus of the meeting was to also share Hazard Profiles, Hazard Assessments, and Questionnaire results with the public. Again Mr. Joe Vanderwerff, from the Winnebago County Highway Department, hosted the public meeting and was interviewed by the local Rockford Channel 13 NBC news. While this meeting's attendance was also low, the interview was well received and again, successfully generated significant traffic to the County's Hazard Mitigation website.

Both public meeting notices were widely distributed via news press releases, newspaper articles, informational brochures, and on the Winnebago County website. For the first Public "Kick-Off" meeting, a press release was posted in the Beloit Daily News newspaper, WROK 1440 AM, River Rock Times, Rockford Register Star newspaper, TV-WREX 13, TV-WTVO 17, TV-WIFR 23, and TV-WQRF 39 announcing the date, time, and location of the first meeting and inviting all interested persons to attend.

For the second public meeting, two newspaper announcements were placed in local newspapers: The Beloit Daily News and the Rockford Register Star. The two newspaper articles can be seen in Appendix E along with the press releases from the first public meeting and public invitation to review the draft plan.

2.3.3. Multi-Media Outreach

The Planning Team worked with FMSM Engineers to develop and host a multi-media website for purposes of promoting planning meetings, hazard questionnaires, storing documents, facilitating Plan review and providing general plan information to the public and stakeholders. During the planning process, the site was accessible from the County's homepage at http://co.winnebago.il.us/ or directly at http://gis.fmsm.com/hazplan.

The site allowed users to upload, download, and access sections and supporting documents of the hazard plan. The result allowed the public to easily obtain and comment on the Plan during both draft stages and prior to Plan adoption. The site was also used to disseminate brochures, past presentations, meeting minutes, other example hazard plans, promote FEMA mitigation project programs and link to the Illinois Emergency Management Agency for additional support. The website proved to be very successful for reaching the community at-large, including those who were unable to attend the public or stakeholder meetings.

2.3.4. Public Hazards Questionnaire

The Planning Team worked with their planning consultant to develop and approve a hazard questionnaire. The purpose was to solicit additional feedback from the community in regard to perceived threats, vulnerabilities and general awareness of the risks associated with natural hazards. Questionnaires and brochures were disseminated to individual community City Halls and also made available upon the Hazard Mitigation Planning website www.gis.fmsm.com/hazplan.

Between promotions from local news channels, the website, and the Planning Team, over 260 participants completed the survey. The results were ultimately used to support the Plan's Risk Assessment. Questionnaire results are summarized in Appendix F.

2.3.5. Public Access to Plan Throughout Development

The Planning Team worked with their planning consultant to utilize the Hazard Mitigation Plan website to publish draft sections of the Plan as they became available. Mr. David Townsend from the Winnebago County Highway Department was listed as the primary contact for public questions or comments. Comments received were then submitted to the planning consultant during the pre-approval plan review.

2.3.6. Public Review of Draft Plan

The draft plan was assembled and provided to the public and Planning Team for review on November 30, 2007. The public and Planning Team were given two weeks to provide comment. Hardcopy versions of the draft plan were delivered to each jurisdiction's City Hall, while electronic versions were made assessable from the Hazard Mitigation Plan website http://gis.fmsm.com/hazplan. A press release was issued to encourage the public to access and comment on the plan. Comments received were then submitted to the planning consultant during the pre-approval plan review.

2.3.7. Final Plan Access

Following local adoption and FEMA approval of the Plan, the document will be made available to the public at the following locations:

a. Each municipal office building and public library in the county as follows:

- Village of Cherry Valley, Village of Durand, City of Loves Park,
- Village of Machesney Park, Village of New Millford,
- Village of Pecatonica, City of Rockford, Village of Rockton,
- Village of Roscoe, City of South Beloit, and Village of Winnegago,

b. Winnebago County Highway Department,

c. Winnegabgo County Administration Building and,

d. Winnebago County Website (www.wincoil.us/).

2.4. Incorporation of Existing Documents

Existing plans, studies, reports, and technical information were collected from agencies during the Planning Team and group meetings. The Planning Team members reviewed and identified common problems, development policies, mitigation strategies, and other policies, plans, programs, and regulations. As part of this effort, the Team contacted numerous agencies seeking local hazard data, existing plans, partnerships, common goals, projects, and commitment to an all natural hazards mitigation plan. This outreach included soliciting information from federal, state, and local resources.

The following are examples of the types of information used to identify natural hazards, vulnerable areas and assets, mitigation actions, and mitigation projects.

- 2020 Plan and Amendments. Locates areas for acquisition and unsuitable development within the City of Rockford to prevent loss of life and structures to a natural hazard such as flood.

- Capital Improvement Plan. Village of Roscoe's Capital Improvement Plan documents sources of funding for mitigation projects for improving roads, sewers, and public water systems.

- Emergency Operations Plan (EOP). Winnebago County maintains an Emergency Operations Plan. The plan is a source for hazard identification and emergency operation procedures. Procedures include lists of roles and responsibilities of persons/departments in charge of dispatching support during a natural hazard, rules that are followed, evacuation routes, etc. The EOP proved to be a valuable source of information for both risk assessment and mitigation for this hazard mitigation plan.

- Flood Insurance Rate Maps (FIRMs). Winnebago County's Flood Insurance Rate Maps were recently updated to Digital Flood Insurance Rate Maps (DFIRM) and the data was used in correlation with Geographic Information Systems (GIS) to estimate structural vulnerability and critical facilities that are located within area floodplains.

- Flood Insurance Study Reports (FIS). The FIS reports from the DFIRM update were useful in providing information for each stream/river segment prone to flooding and the jurisdictions within Winnebago County with known flood problems.

- Illinois State Hazard Mitigation Plan. The state hazard mitigation plan was useful in providing information for each hazard (i.e. identifying hazards), vulnerability classes, and assessment methods.

- Land-Use Plans. Winnebago County maintains a land use plan that not only contains current land uses within the area, but projected land uses for 2010 and 2030. This information was helpful in assessing the development trends within the county. The county also has a Comprehensive Land Use Plan and Unified Development Ordinance which was used to assess the development trends. Including subdivision ordinances, and requirements for burying utilities.

- National Flood Insurance Program (NFIP). Winnebago County became an NFIP community in 1975. The flood insurance rate maps were updated in 2006 and are used to enforce floodplain regulations and the local floodplain ordinance.

- Storm water Detention Ordinance. Requires storm water run off to be controlled to prevent flooding in local areas (i.e. Chapter 151 of Village of Roscoe Ordinance).

- Surface Water Management Plan. The City of Rockford maintains a surface water management plan that contains regulations and standards for building in the floodplain, storing hazardous material in the floodplain, and enforcement actions.

- Year 2035 Long Range Transportation Plan. Promotes smart growth for the City of Rockford by implementing a transit rail plan, a pedestrian path plan, population household forecasting, and commuting patterns.

- Water Division Ordinance. Division of Water implements this ordinance during water usage restrictions due to persistent drought or water shortages.

- Zoning Ordinances. Zoning ordinances were examined to confirm that floodplain building restrictions and other zoning ordinances were considered during the development of mitigation actions. Winnebago County also adopted a version of the International Building Code which promotes durable construction that will withstand most natural hazards and protect the citizens of the county.

These and other existing plans, reports, and studies are incorporated or referenced throughout the Plan.

3. Risk Assessment

The Risk Assessment portion of this Plan identifies, profiles, and assesses the natural hazards that are known to affect Winnebago County. The process incorporates describing

each hazard and its effects, researching past events, documenting recorded damages, and assessing the probability and consequences of the event happening again.

3.1. Identifying Hazards

Natural hazards in the United States occur in many forms. They can be weather related such as flash floods, severe thunderstorms (hail, wind, and tornadoes), severe winter storms (snow, ice, and frigid temperatures), and coastal storms (hurricanes, storm surges, and tsunamis). They can be geological hazards including volcanoes, earthquakes, and landslides. They can be climatologic including drought, excessive heat, and wildfires, or they can also be driven by topography and hydrology which affects riverine flooding from upstream rain or snow events. Understanding and identifying these hazards and their relationship to land, infrastructure, and population is the first step to achieving risk awareness.

During the process of "Hazard Identification", the Planning Team considered several hazards known to impact communities throughout the United States. Hazards considered included:

- Avalanche
- Coastal Storms
- Drought
- Earthquake
- Extreme Heat
- Flood
- Hailstorm
- Hurricane
- Mine Subsidence
- Severe Winter Storm
- Tornado
- Tsunami
- Volcano
- Wildfire
- Windstorm

The Planning Team carefully considered regional hazard data, past documented events, and other known sources of hazard information to identify the natural hazards most likely affect Winnegago County. The hazards identified are also consistent with those detailed within the State's Hazard Mitigation Plan and are:

- Drought
- Earthquake
- Extreme Heat
- Floods
- Severe Storms
- Severe Winter Storms
- Tornadoes

3.1.1. Natural Hazards Not Identified Within the Plan

Some natural hazards have little or no effect on Winnebago County and were not addressed in this Plan. They include avalanche and landslides, coastal storms and hurricanes, mine subsidence or karst, and volcanoes or wildfire. While, each of these hazards were determined to present little to no threat within Winnebago County, they are not precluded from being incorporated into future updates of the Plan as new information is discovered.

The following hazards were excluded within the Plan:

- Avalanche and Landslides. The topography and climate of the Winnebago County area are not conducive to the occurrence of avalanches. No historical events have been recorded in the Winnebago County area.

- Coastal Storms and Hurricanes. The Winnebago County area is more than 830 miles from the Gulf of Mexico coast and over 945 miles from the Atlantic Ocean coast. The immediate effects of coastal storms (hurricanes, storm surge, and tsunamis) are not felt in the Winnebago County area. The secondary effects or remnants of hurricanes may produce severe thunderstorms and flooding in the area and those hazards are addressed by the Plan.

- Subsidence. Mine subsidence is defined as the collapse of underground coal mines resulting in direct damage to a surface structure. Land subsidence occurs when the ground sinks to a lower than normal level. Winnebago County has no active mines; therefore this does not present a threat and is not covered in this Plan.

- Volcanoes. More than 50 volcanoes in the U.S. have erupted one or more times in the past 200 years. Volcanoes produce a wide variety of hazards that can take lives and destroy property. Active volcanoes in North America are in California, Oregon, Washington, Alaska, Mexico, Canada, and the Caribbean Islands. Large explosive eruptions can endanger people and property hundreds of miles away and even affect global climate. However, there are no active volcanoes within 950 miles of the Winnebago County area. Volcanic activity as a hazard is judged to be minimal and will not be addressed in this Plan.

- Wildfire. A wildfire is an uncontrollable burning of grasslands, brush, or woodlands. The potential for wildfire depends upon surface fuel characteristics, weather conditions, recent climate conditions, topography, and fire behavior. Neither Winnebago County or its jurisdictions have a history of wildfire and will not be addressed in this Plan.

Data sources utilized to determine which hazards to include or exclude within the Plan included: hazard data, reports, plans, flood ordinances, past hazard events, flood insurance claims, land use regulations for hazard data, local records of the emergency management offices, local newspapers, historical knowledge of Planning Team participants, local officials and community members, as well as GIS information from WinGIS and HAZUS-MH.

Additional research used to identify hazards included interviews with knowledgeable officials and residents in the planning area, the use of FEMA and other web based databases and information sources that identify hazards by geographic locations, US Army Corps of Engineers flood data, Flood Insurance Rate Maps (FIRM), Flood Insurance Studies (FIS), GIS, and additional available historic data including information on past hazard events.

3.1.2. Natural Hazards Identified Within the Plan

Natural hazards included within this Plan included:

- Drought
- Earthquake
- Extreme Heat
- Flood
- Severe Storms
- Severe Winter Storms
- Tornadoes

The following section is provided to describe each hazard and its associated causes and effects.

3.1.2.1. Drought

Description. A drought is defined as the cumulative deficit of precipitation relative to what is normal for a region over an extended period of time. Unlike other natural hazards, a drought is a non-event that evolves as a prolonged dry spell. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

When a drought begins or ends may be difficult to determine. A drought can be short, lasting just a few months, or persist for years before climatic conditions return to normal. While drought conditions can occur at any time throughout the year, the most apparent time is during the summer months. High temperatures, prolonged high winds, and low relative humidity can aggravate drought conditions.

Because the impacts of a drought accumulate slowly at first, a drought may not be recognized until it has become well established. The many aspects of drought reflect its varied impacts on people and the environment. While the impacts of precipitation deficit may be extensive, it is the deficit, not the impacts, that defines a meteorological drought.

In the US. Droughts can lead to economic losses such as unemployment, decreased land values, and Agro-business losses. In 1998, over two billion dollars in property loss was credited to drought in the US.

Primary Effects.

- Crop failure is the most apparent effect of drought in that it has a direct impact on the economy and, in many cases, health (nutrition) of the population that is affected by it. Due to a lack of water and moisture in the soil, many crops will not produce normally or efficiently and, in many cases, may be lost entirely.

- Water shortage is a very serious effect of drought in that the availability of potable water is severely decreased when drought conditions persist. Springs, wells, streams, and reservoirs have been known to run dry due to the decrease in ground water, and, in extreme cases, navigable rivers have become unsafe for navigation as a result of drought.

Secondary Effects.

- Fire susceptibility is increased with the absence of moisture associated with a drought. Dry conditions have been known to promote the occurrence of widespread wildfires.

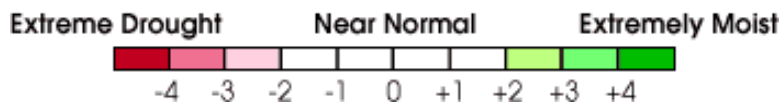
Tertiary Effects.

- Environmental degradation in the forms of erosion and ecological damage can be seen in cases of drought. As moisture in topsoil decreases and the ground becomes dryer, the susceptibility to windblown erosion increases. In prolonged drought situations, forest root systems can be damaged and/or destroyed resulting in loss of habitat for certain species. In addition, prolonged drought conditions may result in loss of food sources for certain species.

- In prolonged drought situations the soil surrounding structures subsides, sometimes creating cracks in foundations and separation of foundations from above ground portions of the structure.

The Palmer Drought Severity Index (PDSI) shows the relative dryness or wetness effecting water sensitive economies. The PDSI indicates the prolonged and abnormal moisture deficiency or excess.

Palmer Drought Severity Index.



The PDSI is an important climatological tool for evaluating the scope, severity, and frequency of prolonged periods of abnormally dry or wet weather. It can be used to help delineate disaster areas and indicate the availability of irrigation water supplies, reservoir levels, range conditions, amount of stock water, and potential intensity of forest fires.

Table 8. Palmer Classification System

+4.0 inches or more	Extremely wet
3.0 inches to 3.99 inches	Very wet
2.0 inches to 2.99 inches	Moderately wet
1.0 inches to 1.99 inches	Slightly wet
0.5 inches to 0.99 inches	Incipient wet spell
0.49 inches to -0.49 inches	Near normal
-0.5 inches to -0.99 inches	Incipient dry spell
-1.9 inches to -1.99 inches	Mild drought
-2.0 inches to -2.99 inches	Moderate drought

Table 8. Palmer Classification System

+4.0 inches or more	Extremely wet
-3.0 inches to -3.99 inches	Severe drought
-4.0 inches or less	Extreme drought

Drought is measured in the Palmer Drought Severity Index according to the level of recorded precipitation against the average, or normal, amount of precipitation for a region.

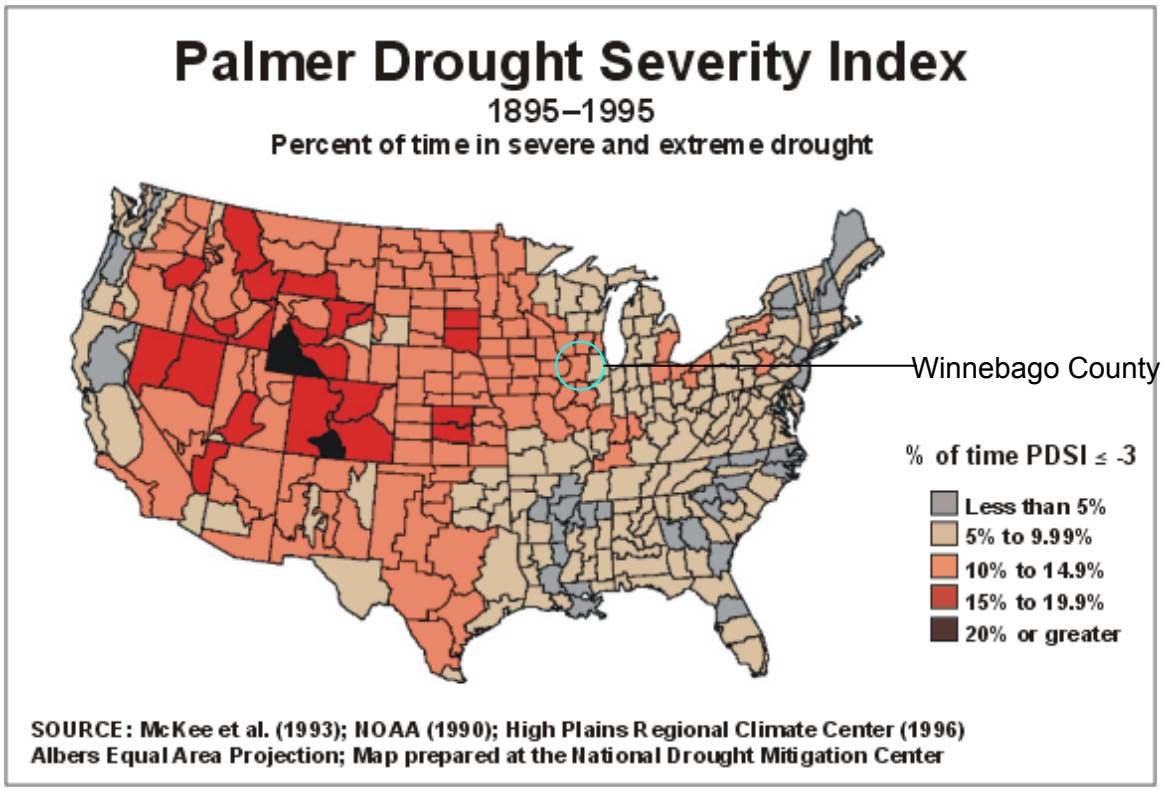


Figure 1. Palmer Drought Severity Index Map, 1895-1995

In the 100-year map for 1895 to 1995, Winnebago County and its multiple jurisdictions are within the 10% to 14.9% range for having a PDSI less than or equal to -3 (severe to extreme drought rating). For the 10-year interval of 1985-1995, Winnebago County had a severe drought rating of 5.9% to 9.9%.

3.1.2.2. Earthquake

Description. An earthquake is a sudden, rapid shaking of the earth caused by the breaking and shifting of rock beneath the earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the earth as the huge plates that form the earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual while at other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free releasing the stored energy and producing seismic waves, generating an earthquake. The areas of

greatest tectonic instability occur at the perimeters of the slowly moving plates, as these locations are subjected to the greatest strains from plates traveling in opposite directions and at different speeds. However, some earthquakes occur in the middle of plates.

Earthquakes result from crustal strain, volcanism, landslides, or the collapse of caverns. An earthquake is the motion or trembling of the ground produced by sudden displacement of rock in the earth's crust. Ground motion, the movement of the earth's surface during earthquakes or explosions, is the catalyst for most of the damage during an earthquake. Produced by waves generated by a sudden slip of a fault or sudden pressure at the explosive source, ground motion travels through the earth and along its surface. Ground motions are amplified by soft soils overlying hard bedrock, referred to as ground motion amplification. Ground motion amplification can cause an excess amount of damage during an earthquake, even to sites very far from the epicenter.

Earthquakes can affect hundreds of thousands of square kilometers; cause damage to property measured in the tens of billions of dollars; result in loss of life and injury to hundreds of thousands of persons; and disrupt the social and economic functioning of the affected area. Ground shaking from earthquakes can collapse buildings and bridges, disrupt gas, electric, phone service, and sometimes trigger landslides, avalanches, flash floods, fires, and destructive ocean waves (tsunamis). During an earthquake, buildings with foundations resting on unconsolidated fill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings. When an earthquake occurs in a populated area, it may cause deaths, injuries, and extensive property damage.

Most property damage and earthquake-related deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the amplitude and duration of the shaking, which are directly related to the earthquake size, distance from the fault site, and regional geology. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (mountain regions and along hillsides), and liquefaction, in which ground soil loses the ability to resist shear and flows much like quick sand. In the case of liquefaction, anything relying on the substrata for support can shift, tilt, rupture, or collapse.

The Northridge, California, earthquake of January 17, 1994, struck a modern urban environment generally designed to withstand the forces of earthquakes. Its economic cost, nevertheless, has been estimated at $20 billion. Fortunately, relatively few lives were lost. Exactly one year later, Kobe, Japan, a densely populated community less prepared for earthquakes than Northridge, was devastated by the most costly earthquake ever to occur. Property losses were projected at $96 billion, and at least 5,378 people were killed. These two earthquakes tested building codes and construction practices, as well as emergency preparedness and response procedures.

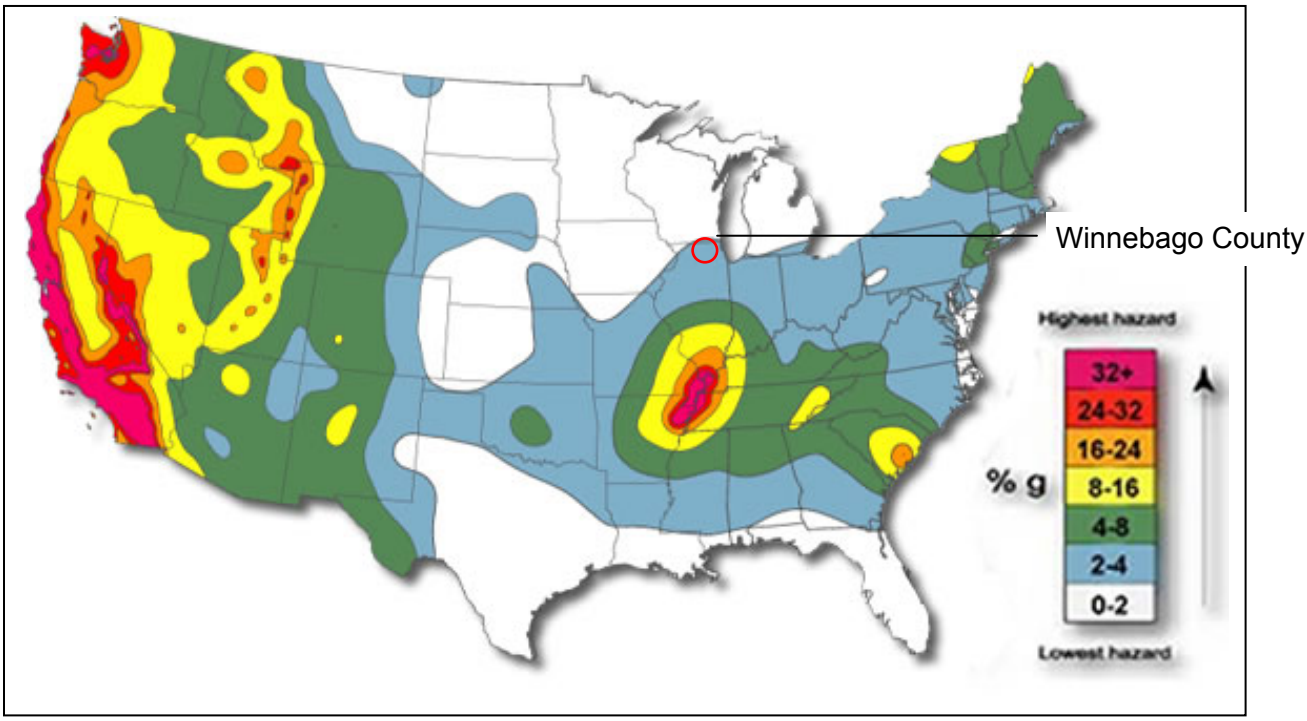


Figure 2. USGS Earthquake Probability Map

California experiences the most frequent damaging earthquakes. However, Alaska experiences the greatest number of large earthquakes, most located in uninhabited areas. The largest earthquakes felt in the U. S. were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude of 8 on the Richter Scale. These earthquakes were felt over the entire eastern U.S., with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Earthquake Types. Earthquakes are measured in terms of their magnitude and intensity. Magnitude is measured using the Richter Scale that describes the energy release of an earthquake through a measure of shock wave amplitude. Intensity is most commonly measured using the Modified Mercalli Intensity (MMI) Scale.

The Richter magnitude scale measures an earthquake's magnitude using an open-ended logarithmic scale that describes the energy release of an earthquake through a measure of shock wave amplitude. The earthquake's magnitude is expressed in whole numbers and decimal fractions. Each whole number increase in magnitude represents a 10-fold increase in measured wave amplitude, or a release of 32 times more energy than the preceding whole number value.

The Modified Mercalli Scale measures the effect of an earthquake on the earth's surface. Composed of 12 increasing levels of intensity that range from unnoticeable shaking to catastrophic destruction, the scale is designated by Roman numerals. The intensity of each event corresponds with Roman numerals, with I corresponding to imperceptible (instrumental) events, IV corresponding to moderate (felt by people awake), to XII for

catastrophic (total destruction). The lower values of the scale detail the manner in which people feel the earthquake, while the increasing values are based on observed structural damage. The intensity values are assigned after gathering responses to questionnaires administered to postmasters in affected areas in the aftermath of the earthquake.

A detailed description of the Modified Mercalli Scale of Earthquake Intensity and its correspondence to the Richter Scale is given in the Table 8.

Table 9. Modified Mercalli Intensity Scale for Earthquakes

Scale	Intensity	Description	Corresponding Richter Scale Magnitude
I	Instrumental	Detected only on seismographs	
II	Feeble	Some people feel it	<4.2
III	Slight	Felt by people resting; like a truck rumbling by	
IV	Moderate	Felt by people walking	
V	Slightly Strong	Sleepers awake; church bells ring	<4.8
VI	Strong	Trees sway; suspended objects swing, objects fall off shelves	<5.4
VII	Very Strong	Mild Alarm; walls crack; plaster falls	<6.1
VIII	Destructive	Moving cars uncontrollable; masonry fractures, poorly constructed buildings damaged	
IX	Ruinous	Some houses collapse; ground cracks; pipes break open	<6.9
X	Disastrous	Ground cracks profusely; many buildings destroyed; liquefaction and landslides are widespread	<7.3
XI	Very Disastrous	Most buildings and bridges collapse; roads, railways, pipes and cables destroyed; general triggering of other hazards	<8.1
XII	Catastrophic	Total destruction; trees fall; ground rises and falls in waves	>8.1

In the US. Earthquakes strike suddenly and without warning and can occur at any time of the year, and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future earthquake in the US approach $200 billion. There are 45 states and territories in the US at moderate to very high risk from earthquakes.

Earthquake Effects. The effects from earthquakes are caused by ground shaking, surface faulting, ground failure, and less commonly, tsunamis.

- *Ground Shaking* is a term used to describe the vibration of the ground during an earthquake. Ground shaking is caused by body waves and surface waves. As a generalization, the severity of ground shaking increases as magnitude increases, and decreases as distance from the causative fault increases.

- *Surface Faulting* is the differential movement of the two sides of a fracture at the earth's surface. There are three general types of faulting: strike-slip, normal, and reverse. (Combinations of the strike-slip type and the other two fault types can be found.) Surface faulting applies to differential movements caused by deep-seated forces in the earth, the slow movement of sedimentary deposits toward the Gulf of Mexico, and faulting associated with salt domes. Death and injuries from surface faulting are very unlikely, but casualties can occur indirectly through fault damage to structures.

- *Ground Failure* many times is induced by liquefaction which is a physical process, not a type of ground failure. As a consequence of liquefaction, clay-free soil deposits, primarily sands and silts, temporarily lose strength and act as viscous fluids rather than solid soils. Liquefaction takes place when seismic shear waves pass through a saturated granular soil layer, distort its granular structure, and cause some of the void spaces to collapse. Disruptions to the soil generated by these collapses cause transfer of the ground-shaking load from grain-to-grain contacts in the soil layer to the pore water. This transfer of load increases pressure in the pore water, either causing drainage to occur or, if drainage is restricted, a sudden buildup of pore-water pressure. When the pore-water pressure rises to about the pressure caused by the weight of the column of soil, the granular soil layer behaves like a fluid rather than like a solid for a short period. In this condition, deformations can occur easily. Liquefaction causes three types of ground failure: lateral spreads, flow failures, and loss of bearing strength. In addition, liquefaction enhances ground settlement and sometimes generates sand boils (fountains of water and sediment emanating from the pressurized liquefied zone). Sand boils can cause local flooding and the deposition or accumulation of silt.

- *Lateral Spreads.* Involve the lateral movement of large blocks of soil as a result of liquefaction in a subsurface layer. Movement takes place in response to the ground shaking generated by an earthquake. Lateral spreads generally develop on gentle slopes, most commonly on those between 0.3 and 3 degrees. Horizontal movements on lateral spreads commonly are as much as 10 to 15 feet, but, where slopes are particularly favorable and the duration of ground shaking is long, lateral movement may be as much as 100 to 150 feet. Lateral spreads usually break up internally, forming numerous fissures and scarps.

<u>Earthquake Facts.</u>

a. The largest recorded earthquake in the United States was a magnitude 9.2 that struck Prince William Sound, Alaska on Good Friday, March 28, 1964.

b. Alaska is the most earthquake-prone state and one of the most seismically active regions in the world. Alaska experiences a magnitude 7 earthquake almost every year, and a magnitude 8 or greater earthquake on average every 14 years.

c. The National Earthquake Information Center now locates about 12,000 to 14,000 earthquakes worldwide each year, or 35 a day on average.

d. From 1975-1995 there were only four states that did not have any earthquakes. They were: Florida, Iowa, North Dakota, and Wisconsin.

e. Although earthquakes in the central or eastern U. S. occur less frequently, they affect much larger areas than earthquakes of similar magnitude in the western U. S. For example, the San Francisco, earthquake of 1906 (magnitude 7.8) was felt 350 miles away in the middle of Nevada, whereas the New Madrid earthquake of December 1811 (magnitude 8.0) rang church bells in Boston, Massachusetts, 1,000 miles away. Differences in geology east and west of the Rocky Mountains cause this strong contrast.

Likelihood of Occurrence. The goal of earthquake prediction is to give warning of potentially damaging earthquakes early enough to allow appropriate response to the disaster, enabling people to minimize loss of life and property. The USGS conducts and supports research on the likelihood of future earthquakes. This research includes field, laboratory, and theoretical investigations of earthquake mechanisms and fault zones. A primary goal of earthquake research is to increase the reliability of earthquake probability estimates. Ultimately, scientists would like to be able to specify a high probability for a specific earthquake, on a particular fault, within a particular year. Scientists estimate earthquake probabilities in two ways: by studying the history of large earthquakes in a specific area, and by the rate at which strain accumulates in the rock.

Scientists study the past frequency of large earthquakes in order to determine the future likelihood of similar large shocks. For example, if a region has experienced four magnitude 7 or larger earthquakes during 200 years of recorded history, and if these shocks occurred randomly in time, then scientists would assign a 50 percent probability (that is, just as likely to happen as not to happen) to the occurrence of another magnitude 7 or larger quake in the region during the next 50 years.

But in many places, the assumption of random occurrence with time may not be true, because when strain is released along one part of the fault system, it may actually increase on another part. Four magnitude 6.8 or larger earthquakes and many magnitude 6 - 6.5 shocks occurred in the San Francisco Bay region during the 75 years between 1836 and 1911. For the next 68 years (until 1979), no earthquakes of magnitude 6 or larger occurred in the region. Beginning with a magnitude 6.0 “shock” in 1979, the earthquake activity in the region increased dramatically; between 1979 and 1989, there were four, magnitude 6 or greater earthquakes, including the magnitude 7.1 Loma Prieta earthquake. This clustering of earthquakes leads scientists to estimate that the probability of a magnitude 6.8 or larger earthquake occurring during the next 30 years in the San Francisco Bay region is about 67 percent (twice as likely as not).

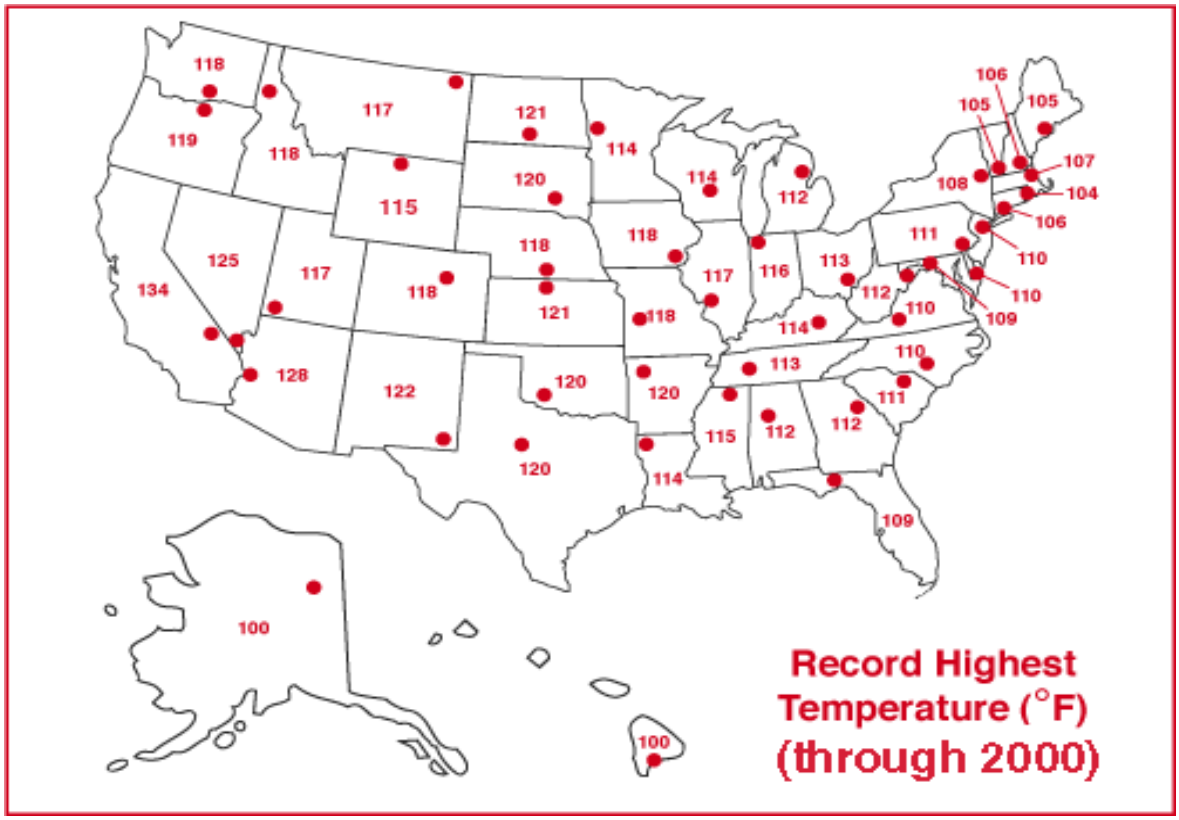
3.1.2.3. Extreme Heat

Description. Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat.

Heat Index. Our bodies dissipate heat by varying the rate and depth of blood circulation, by losing water through the skin and sweat glands, and as a last resort, by panting, when blood is heated above 98.6°F. Sweating cools the body through evaporation. However, high relative humidity retards evaporation, robbing the body of its ability to cool itself.

In the US. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the US by the effects of heat and solar radiation. In the disastrous heat wave of 1980, more than 1,250 people died.

Figure 3. United States Highest Temperature Records per State



Temperature (F) versus Relative Humidity (%)

°F	90%	80%	70%	60%	50%	40%
80	85	84	82	81	80	79
85	101	96	92	90	86	84
90	121	113	105	99	94	90
95		133	122	113	105	98
100			142	129	118	109
105				148	133	121
110						135

HI	Possible Heat Disorder:
80°F - 90°F	Fatigue possible with prolonged exposure and physical activity.
90°F - 105°F	Sunstroke, heat cramps and heat exhaustion possible.
105°F - 130°F	Sunstroke, heat cramps, and heat exhaustion likely, and heat stroke possible.
130°F or greater	**Heat stroke highly likely with continued exposure.**

Figure 4. Temperature versus Relative Humidity Scale

*http://www.crh.noaa.gov/pub/heat.htm

* Due to the nature of the heat index calculation, the values in the table have an error +/- 1.3 F.

NOAA's National Weather Service Heat Index Program. Based on the latest research findings, the NWS has devised the "Heat Index" (HI). The HI, given in degrees F, is an accurate measure of how hot it really feels when relative humidity (RH) is added to the actual air temperature. The NWS will initiate alert procedures when the HI is expected to exceed 105°- 110°F for at least two consecutive days. The Heat Index is the temperature the body feels when heat and humidity are combined. The chart below shows the HI that corresponds to the actual air temperature and relative humidity.

Considering the tragic death toll which occurred in 1980, the NWS has stepped up its efforts to more effectively alert the general public and appropriate authorities to the hazards of heat waves-those prolonged excessive heat/humidity episodes.

Table 10. Heat Index/Heat Disorders Impacts

Heat Index	Heat Disorders Impacts
130° or Higher	Heatstroke/sunstroke highly likely with continued exposure
105°- 130°	Sunstroke, heat cramps or heat exhaustion likely, and heatstroke possible with prolonged exposure and/or physical activity
90°- 105°	Sunstroke, heat cramps and heat exhaustion possible with prolonged exposure and/or physical activity
80° - 90°	Fatigue possible with prolonged exposure and/or physical activity

Types of Heat Disorder Symptoms. When heat gain exceeds the level the body can remove, body temperature begins to rise, and heat related illnesses and disorders might develop. Elderly persons, small children, chronic invalids, those on certain medications and persons with weight and alcohol problems are particularly susceptible to heat reactions, especially during heat waves in areas where a moderate climate usually prevails. Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating, or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds the level the body can remove, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise and heat-related illness may develop.

Ranging in severity, heat disorders share one common feature: the individual has overexposed or over exercised for his age and physical condition in the existing thermal environment. Studies indicate that, other things being equal, the severity of heat disorders tend to increase with age. Heat cramps in a 17-year-old may be heat exhaustion in someone 40, and heat stroke in a person over 60.

- Sunburn. Redness and pain. In severe cases swelling of skin, blisters, fever, and headaches. Sunburn, with its ultraviolet radiation burns, can significantly retard the skin's ability to shed excess heat.

- Heat Cramps. Painful spasms usually in muscles of legs and abdomen possible. Heavy sweating.

- Heat Exhaustion. Heavy sweating, weakness, skin cold, pale and clammy. Thready pulse. Normal temperature possible. Fainting and vomiting.

- Heat Stroke (or sunstroke). High body temperature (106° F. or higher). Hot dry skin. Rapid and strong pulse. Possible unconsciousness.

3.1.2.4. Flood

Description. A flood is a natural event for rivers and streams and is caused in a variety of ways. Floods can be slow, or fast rising, but generally develop over a period of days. Winter or spring rains, coupled with melting snows, can fill river basins too quickly. Torrential rains from decaying hurricanes or other tropical systems can also produce flooding. The excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains.

A flood, as defined by the National Flood Insurance Program (NFIP) is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- A mudflow; or,
- A collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood.

Floods are generally the result of excessive precipitation, and can be classified under two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and general floods, caused by precipitation over a longer time period and over a given river basin.

The severity of a flooding event is determined by a combination of stream and river basin topography and physiography, precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing. Flood currents also possess tremendous destructive power as lateral forces can demolish buildings and erosion can undermine bridge foundations and footings, leading to the collapse of structures.

Flash flooding events usually occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam.

General floods are usually longer-term events and may last for several days. The primary types of general flooding include riverine flooding, coastal flooding, and urban flooding.

Periodic flooding of lands adjacent to rivers, streams, and shorelines is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood. Flood magnitude increases with increasing recurrence interval. A "floodplain" is the lowland area adjacent to a river, lake, or ocean.

Floodplains are designated by the frequency of the flood that is large enough to cover them. One way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1% chance of occurring in any given year.

In the US. Flooding is the most frequent and costly natural hazard in the U S. Property damage from flooding now totals over $1 billion each year in the U.S. More than $4 billion is spent on flood damage in the U.S. each year.

During the 20th century, floods were the number one natural disaster in the U.S. in terms of number of lives lost and property damage, and floods are the number one weather-related killer. Flooding has caused the deaths of more than 10,000 people since 1900

Common Flood-Related Terms:

100-Year Flood Plain: The area that has a 1% chance, on average, of flooding in any given year. (Also known as the Base Flood.)

500-Year Flood Plain: The area that has a 0.2% chance, on average, of flooding in any given year.

Base Flood: Represents a compromise between minor floods and the greatest flood likely to occur in a given area. The elevation of water surface resulting from a flood that has a 1% chance of occurring in any given year.

Floodplain: The land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess floodwater. The floodplain is made up of two sections: the floodway and the flood fringe.

Floodway: The NFIP floodway definition is "the channel of a river or other watercourse and adjacent land areas that must be reserved, in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot." The floodway carries the bulk of the floodwater downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Flood Fringe: The flood fringe refers to the outer portions of the floodplain, beginning at the edge of the floodway and continuing outward.

Types. Floods are the result of a multitude of naturally occurring and human-induced factors, but they all can be defined as the accumulation of too much water in too little time in a specific area. Types of floods include regional floods, river or riverine floods, flash floods, urban floods, ice-jam floods, storm-surge floods, and debris, landslide, and mudflow floods. For information on dam- and levee-failure floods, see Dam Failure in this section of the Plan.

- *Regional Flooding* can occur seasonally when winter or spring rains coupled with melting snow fill river basins with too much water too quickly. The ground may be frozen, reducing infiltration into the soil and thereby increasing runoff. Extended wet periods during any part of the year can create saturated soil conditions, after which any additional rain runs off into streams and rivers, until river capacities are exceeded. Regional floods are many times associated with slow-moving, low-pressure or frontal storm systems including decaying hurricanes or tropical storms.

- *River or Riverine Flooding* is a high flow or overflow of water from a river or similar body of water, occurring over a period of time too long to be considered a

flash flood. Riverine flooding is a function of excessive precipitation levels and water runoff volumes within the watershed of a stream or river.

- *Flash Floods* are quick-rising floods that usually occur as the result of heavy rains over a short period of time, often only several hours or even less. Several factors can contribute to flash flooding. Among these are rainfall intensity, rainfall duration, surface conditions, and topography and slope of the receiving basin. Flash floods can occur within several seconds to several hours and with little warning. They can be deadly because they produce rapid rises in water levels and have devastating flow velocities. Most flash flooding is caused by slow-moving thunderstorms in a local area or by heavy rains associated with hurricanes and tropical storms. Although flash flooding occurs often along mountain streams, it is also common in urbanized areas where much of the ground is covered by impervious surfaces.

- *Urban Flooding* is possible when land is converted from fields or woodlands to roads and parking lots; thus, losing its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force. During periods of urban flooding, streets can become swift moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

- *Ice-Jam Flooding* occurs on rivers that are totally or partially frozen. A rise in stream stage will break up a totally frozen river and create ice flows that can pile up on channel obstructions such as shallow riffles, log jams, or bridge piers. The jammed ice creates a dam across the channel over which the water and ice mixture continues to flow, allowing for more jamming to occur. Backwater upstream from the ice dam can rise rapidly and overflow the channel banks. Flooding moves downstream when the ice dam fails, and the water stored behind the dam is released. At this time the flood takes on the characteristics of a flash flood, with the added danger of ice flows that, when driven by the energy of the flood-wave, can inflict serious damage on structures. An added danger of being caught in an ice-jam flood is hypothermia, which can quickly kill.

- *Storm-surge flooding* is water that is pushed up onto otherwise dry land by onshore winds. Friction between the water and the moving air creates drag that, depending upon the distance of water (fetch) and the velocity of the wind, can pile water up to depths greater than 20 feet. Intense, low-pressure systems and hurricanes can create storm-surge flooding. The storm surge is unquestionably the most dangerous part of a hurricane as pounding waves create very hazardous flood currents.

- *Debris, Landslide, and Mudflow Flooding* is created by the accumulation of debris, mud, rocks, and/or logs in a channel, forming a temporary dam. Flooding occurs upstream as water becomes stored behind the temporary dam and then becomes a flash flood when the dam is breached and rapidly washes away. Landslides can create large waves on lakes or embayments and can be deadly.

Urban areas are susceptible to flash floods because a high percentage of the surface area is composed of impervious streets, roofs, and parking lots where runoff occurs very rapidly. Mountainous areas also are susceptible to flash floods, as steep topography may funnel runoff into a narrow canyon. Floodwaters accelerated by steep stream slopes can cause the flood-wave to move downstream too fast to allow escape, resulting in many deaths.

Factors determining the severity of floods include:

a. Rainfall intensity and duration
    1) A large amount of rain over a short time can result in flash flooding
    2) Small amounts may cause flooding where the soil is saturated
    3) Small amounts may cause flooding if concentrated in an area of impermeable surfaces
b. Topography and ground cover
c. Water runoff is greater in areas with steep slopes and little vegetation

Flood Facts:

a. On average, there are about 145 deaths each year due to flooding. 80% of flood deaths occur in vehicles, and most happen when drivers try to navigate through floodwaters.

b. Only six inches of rapidly moving floodwater can knock a person down and a mere two feet of water can float a vehicle.

c. One-third of flooded roads and bridges are so damaged by water that any vehicle trying to cross stands only a 50% chance of making it to the other side.

d. Six to eight million homes are located in flood-prone areas.

e. About one-third of insurance claims for flood damages are for properties located outside identified flood hazard areas.

3.1.2.5. Severe Storm (Thunderstorm, Lightning and Hail)

Descriptions**.** A thunderstorm is formed from a combination of moisture, rapidly rising warm air and a force capable of lifting air such as a warm and cold front, a sea breeze or a mountain. All thunderstorms contain lightning and may occur singly, in clusters or in lines. Thus, it is possible for several thunderstorms to affect one location in the course of a few hours. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended period time. The NWS considers a thunderstorm as severe if it develops ¾ inch hail or 50-knot (58 mph) winds.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a "bolt". This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder.

Radar observers use the intensity of the radar echo to distinguish between rain showers and thunderstorms. Lightning detection networks routinely track cloud-to-ground flashes, and therefore thunderstorms.

Thunderstorms occur when clouds develop sufficient upward motion and are cold enough to provide the ingredients (ice and super cooled water) to generate and separate electrical charges within the cloud. The cumulonimbus cloud is the perfect lightning and thunder factory, earning its nickname, "thunderhead".

All thunderstorms are dangerous and capable of threatening life and property in localized areas. Every thunderstorm produces lightning, which results from the buildup and discharge of electrical energy between positively and negatively charged areas.

While thunderstorms and lightning can be found throughout the U. S., they are most likely to occur in the central and southern states. Thunderstorms are also capable of producing tornadoes and heavy rain that can lead to flash flooding. These hazards will be addressed as individual hazards in the plan.

<u>In the US</u>. Thunderstorms affect relatively small areas as the average storm is 15 miles in diameter and lasts an average of 30 minutes. Nearly 1,800 thunderstorms are occurring at any moment around the world, however, of the estimated 100,000 thunderstorms that occur each year in the U. S. only about 10 percent are classified as severe.

Lightning is the second most frequent killer in the U.S. Each year, lightning is responsible for an average of 93 deaths (more than tornadoes), 300 injuries, and several hundred million dollars in damage to property.

<u>Types of Thunderstorms</u>:

- *Single Cell* (pulse storms). Typically last 20-30 minutes. Pulse storms can produce severe weather elements such as downbursts, hail, some heavy rainfall, and occasionally weak tornadoes. This storm is light to moderately dangerous to the public and moderately to highly dangerous to aviation.

- *Multi-cell Cluster*. These storms consist of a cluster of storms in varying stages of development. Multi-cell storms can produce moderate size hail, flash floods, and weak tornadoes. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.

- *Multi-cell Line*. Multi-cell line storms consist of a line of storms with a continuous, well-developed gust front at the leading edge of the line. Also known as squall lines, these storms can produce small to moderate size hail, occasional flash floods, and weak tornadoes. This storm is moderately dangerous to the public and moderately to highly dangerous to aviation.

- *Supercell*. Even though it is the rarest of storm types, the supercell is the most dangerous because of the extreme weather generated. Defined as a thunderstorm with a rotating updraft, these storms can produce strong downbursts, large hail, occasional flash floods, and weak to violent tornadoes. This storm is extremely dangerous to the public and aviation.

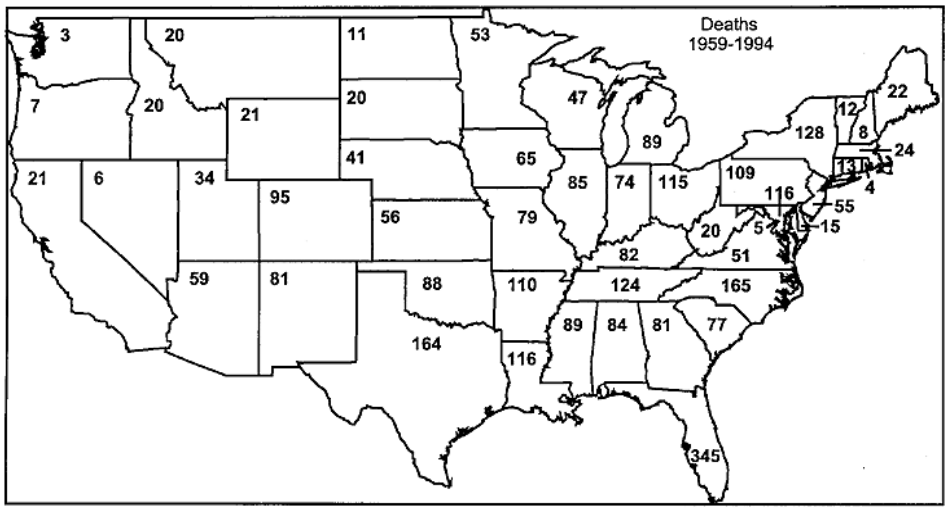
- *Straight-line winds*, which in extreme cases have the potential to exceed 100 miles per hour, are responsible for most thunderstorm wind damage. One type of straight-line wind, the downburst, can cause damage equivalent to a strong tornado and can be extremely dangerous to aviation.

Thunderstorm Facts:

a. The NWS estimates more than 100,000 thunderstorms in the U. S. each year.

b. The National Weather Service considers a thunderstorm as severe if it develops ¾ inch hail or 58 mph winds.

c. In the last 25 years, severe storms have been involved in over 300 federal disasters.



Source: http://kycclim.wku.edu/climate/

Figure 5. Number of Lightning Deaths by State from 1959 to 1994

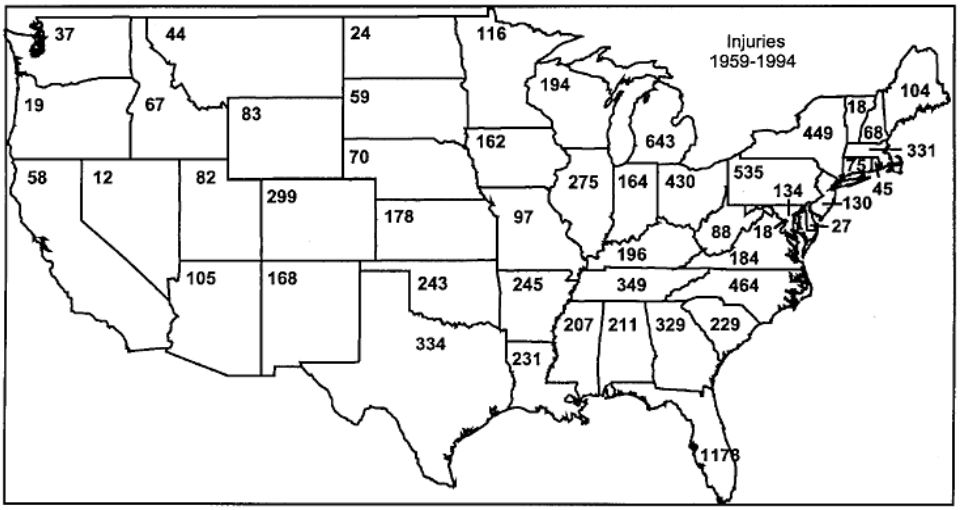


Figure 6. Number of Lightning Injuries by State from 1959 to 1994

Source: http://kycclim.wky.edu/climate/

Types of Lightning. Lightning is a component of all thunderstorms. Flashes that do not strike the surface are called cloud flashes. They may be inside a cloud, travel from one part of a cloud to another, or from cloud to air. Lightning flashes can have more than one ground point. Roughly, there are five to ten times as many cloud flashes than cloud to ground flashes. Overall, there are four different types of lightning:

1) Cloud to sky (sprites)
2) Cloud to ground
3) Intra-cloud
4) Inter-cloud

Cloud to ground lightning can injure or kill people and destroy objects by direct or indirect means. Objects can either absorb or transmit energy. The absorbed energy can cause the object to explode, burn, or totally destruct. The various forms of transfer are:

1) Tall object transferred to person
2) Tall object to ground to person
3) Object (telephone line, plumbing pipes) to a person in contact with the appliance

Effects of Lightning:

a. Fires
    1) Fires may occur in structures such as storage and processing units, aircraft and electrical infrastructure and components.
    2) Forest fires may be initiated by lightning. Lightning causes half the wildfires in the western U.S.

b. Injury and death to people

1) 85% of lightning victims are children and young men ages 10 to 35.
2) 25% of victims die and 70% of survivors suffer long-term effects.

Table 11. Lightning Strike Victims, Denoted Effects

Frequency 25% or Greater	
Memory Deficits & Loss	52% **
Attention Deficits	41% **
Sleep Disturbance	44% *
Numbness/Parathesias	36% **
Dizziness	38% *
Easily Fatigued	37% *
Stiffness in Joints	35%
Irritability/ Temper Loss	34% *
Photophobia	34%
Loss of Strength/Weakness	34% **
Muscle Spasms	34%
Chronic Fatigue	32% *
Hearing Loss	25%
Depression	32% *
Inability to Sit Long	32%
External Burns	32%
Severe Headaches	32% **
Fear of Crowds	29% *
Storm Phobia	29% *
Inability to Cope	29% *
General Weakness	29% **
Unable to Work	29% **
Reduced Libido	26% *
Confusion	25% **
Coordination Problems	28% **

*Denotes Psychologic
**Denotes Psychological or Organic
No Asterisk Denotes Organic

Source: http://www.lightningsafety.com

Lightning Facts:

a. The peak temperature of lightning is around 60,000 degrees Fahrenheit, or about 5 times hotter than the surface of the Sun.
b. Each year, lightning is responsible for an average of 93 deaths, 300 injuries, and several hundred million dollars in damage to property.
c. Lightning most commonly occurs in thunderstorms, but it can also occur in snowstorms, sandstorms, and in the ejected material over volcanoes.

Hail Description. Hail is precipitation in the form of spherical or irregular pellets of ice larger than 5 millimeters (0.2 inches) in diameter (American Heritage Dictionary). Hail is a somewhat frequent occurrence associated with severe thunderstorms. Hailstones grow as

ice pellets are lifted by updrafts, and collect super-cooled water droplets. As the pellets grow, hailstones become heavier and begin to fall. Sometimes, hailstones are caught by successively stronger updrafts and are re-circulated through the cloud growing larger each time the cycle is repeated. Eventually, the updrafts can no longer support the weight of the hailstones. As hailstones fall to the ground, they produce a hail-streak (i.e. area where hail falls) that may be more than a mile wide and a few miles long.

Types of Hail. Hail is a unique and common hazard capable of producing extensive damage from the impact of these falling objects. Hailstorms occur more frequently during the late spring and early summer months. Most thunderstorms do not produce hail, and ones that do normally produce only small hailstones not more than one-half inch in diameter.

Table 12. Hail Conversion Chart

Diameter of Hailstones (inches)	Description
0.50	Marble
0.70	Dime
0.75	Penny
0.88	Nickel
1.00	Quarter
1.25	Half Dollar
1.50	Walnut
1.75	Golf Ball
2.00	Hen Egg
2.50	Tennis Ball
2.75	Baseball
3.00	Tea Cup
4.00	Grapefruit
4.50	Softball

Effects from Hail. Thunderstorms can also produce large, damaging hail, which causes nearly $1 billion in damage to property and crops annually. Hail causes property damage by perforating holes in roofs and shingles, breaking windows, and denting house siding. Hail can also damage automobiles by denting car panels and breaking windows. Hail rarely causes any deaths; however, a couple of dozen people are injured by hailstones each year.

Hail Facts:

a. The majority of hailstorms occur between March and June.

b. When the hail falls to Earth, they come zipping down at 70 to 100 mph. That is why it is a good idea to stay indoors during a major hailstorm!

c. A hailstone measuring 8 inches in diameter and weighing 1.67 pounds was found in Coffeyville, Kansas on 3rd September 1970. It holds the record for the biggest hail stone.

3.1.2.6. Severe Winter Storms

Description. A winter storm can range from moderate snow over a few hours to blizzard conditions with blinding wind-driven snow, sleet and/or ice and extreme cold that lasts several days.

A severe winter storm is defined as an event that drops four or more inches of snow during a 12-hour period or six or more inches during a 24-hour span. Severe winter storms are fueled by strong temperature gradients and an active upper-level cold jet stream. Some winter storms may be large enough to affect several states while others may affect only a single community. Most winter storms are accompanied by low temperatures and blowing snow, which can severely reduce visibility.

Snow and ice are threats to most of the U. S. during the northern hemisphere's winter, which begins December 21 and ends March 21. During the early and late months of the winter season, snow becomes warmer, giving it a greater tendency to melt on contact or stick to the surface. The beginning and end of the winter season also brings a greater chance of freezing rain and sleet.

In the US. Every state in the continental U.S. and Alaska has been impacted by severe winter storms. The super-storm of March 1993 caused over $2 billion in property damage in twenty states and Washington D.C. At least 79 deaths and 600 injuries were attributed to the storm.

Severe Winter Types:

- *Blizzards* are by far the most dangerous of all winter storms. They are characterized by temperatures below twenty degrees Fahrenheit and winds of at least 35 miles per hour. In addition to the temperatures and winds, a blizzard must have a sufficient amount of falling or blowing snow. The snow must reduce visibility to one-quarter mile or less for at least three hours. With high winds and heavy snow, these storms can punish residents throughout much of the U.S. during the winter months each year. In mid-March of 1993, a major blizzard struck the Eastern U.S., including parts of Kentucky.
- *Ice storms* occur when freezing rain falls from clouds and freezes immediately on impact. Ice storms occur when cold air at the surface is overridden by warm, moist air at higher altitudes. As the warm air advances and is lifted over the cold air, precipitation begins falling as rain at high altitudes then becomes super cooled as it passes through the cold air mass below, and, in turn, freezes upon contact with chilled surfaces at temperatures of 32º F or below. In extreme cases, ice may accumulate several inches thick, though just a thin coating is often enough to do severe damage.

Possible Effects. Freezing rain can result in extensive damage to utility lines and buildings while making any type of travel extremely dangerous. The results are sometimes devastating: entire states can be almost entirely without electricity and communication for several weeks. Winter storms can paralyze a community by shutting down normal day-to-day operations. Heavy snow can also lead to the collapse of weak roofs or unstable structures. Storm effects can cause hazardous conditions and hidden problems, including the following:

- *Power outages* result when snow and ice accumulate on trees causing branches and trunks to break and fall onto power lines. Blackouts vary in size from one street to an entire city. Loss of electric power means loss of heat for some residents, which poses a significant threat to human life, particularly the elderly.
- *Extreme cold* temperatures may lead to frozen water mains and pipes, damaged car engines, and prolonged exposure to cold resulting in frostbite.
- *Flooding* may occur after precipitation has accumulated and then temperatures rise once again, which melts snow and ice. In turn, as more snow and ice accumulate the threat of flooding increases.
- *Snow and ice accumulation on roadways* can cause severe transportation problems in the form of extremely hazardous roadway conditions.

Illinois is typically continental, has the polar jet stream located near or over it during the winter months, bringing Low pressure systems and therefore precipitation into the region, and averages 140 days at or below 32°F and 36 inches of snow in the north portion of the state. A combination of any of these can lead to a severe winter storm.

3.1.2.7. Tornadoes

Description. A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. It is spawned by a thunderstorm (or sometimes as a result of a hurricane) and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly.

The damage from a tornado is a result of the high wind velocity and wind-blown debris with paths that can be in excess of one mile wide and fifty miles long. Tornado season is generally March through August, although tornadoes can occur at any time of year. They tend to occur in the afternoons and evenings; over 80 percent of all tornadoes strike between noon and midnight.

Most tornadoes are just a few dozen yards wide and touch down only briefly, but highly destructive tornadoes may carve out a path over a mile wide and several miles long. The destruction caused by tornadoes may range from light to catastrophic depending on the intensity, size, and duration of the storm. Effects of tornadoes may include crop and property damage, power outages, environmental degradation, injury, and death. Tornadoes are known to blow off roofs, move cars and tractor-trailers, and demolish homes.

Typically, tornadoes are localized in impact and cause the greatest damages to structures of light construction, such as residential homes. A tornado can move as fast as 125 mph with internal winds speeds exceeding 300 mph.

The maps below illustrate the predictability of tornadic activity according to NOAA.

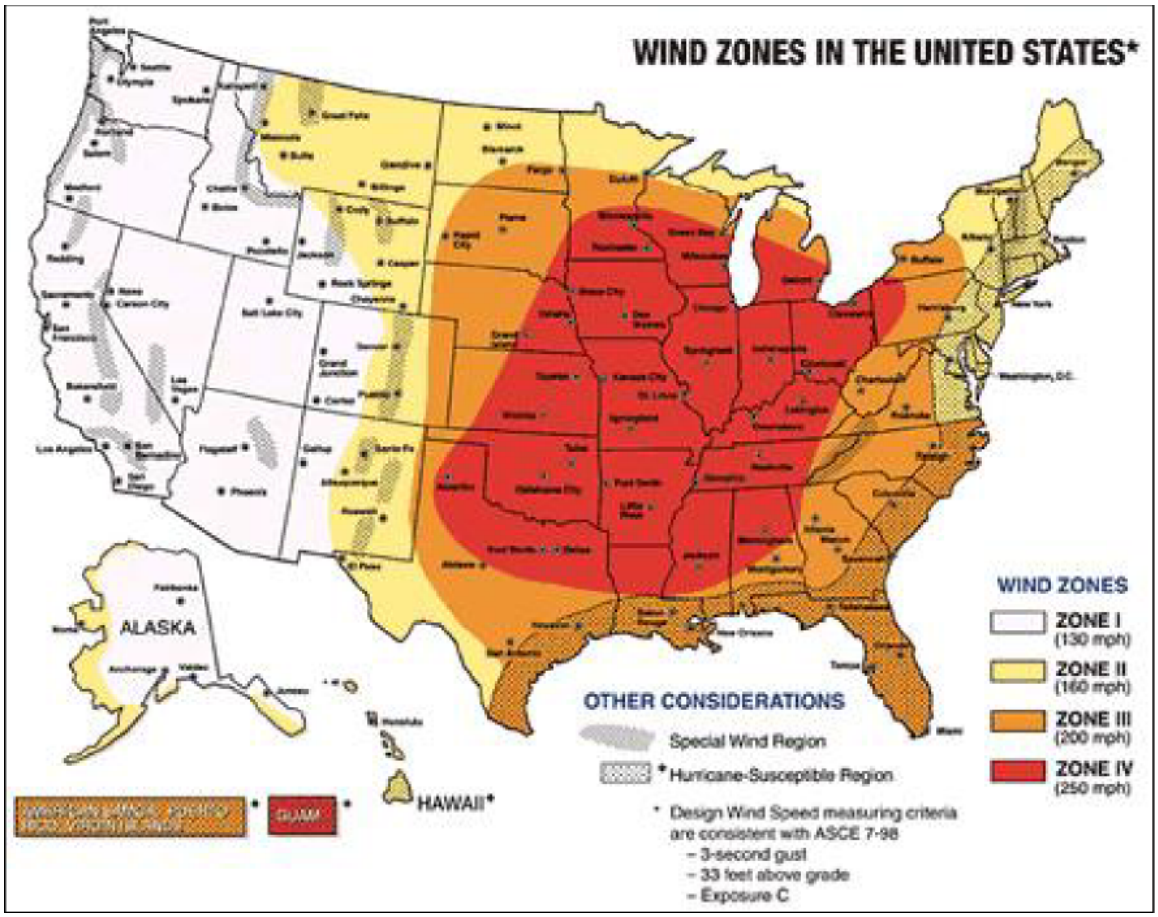


Figure 7. Wind Zones in the United States

Source: http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm

Winnebago County and its jurisdictions are located within the wind Zone IV where wind speeds can reach up to 250 mph. Zone IV signifies that Winnebago County region is highly vulnerable to tornadic weather.

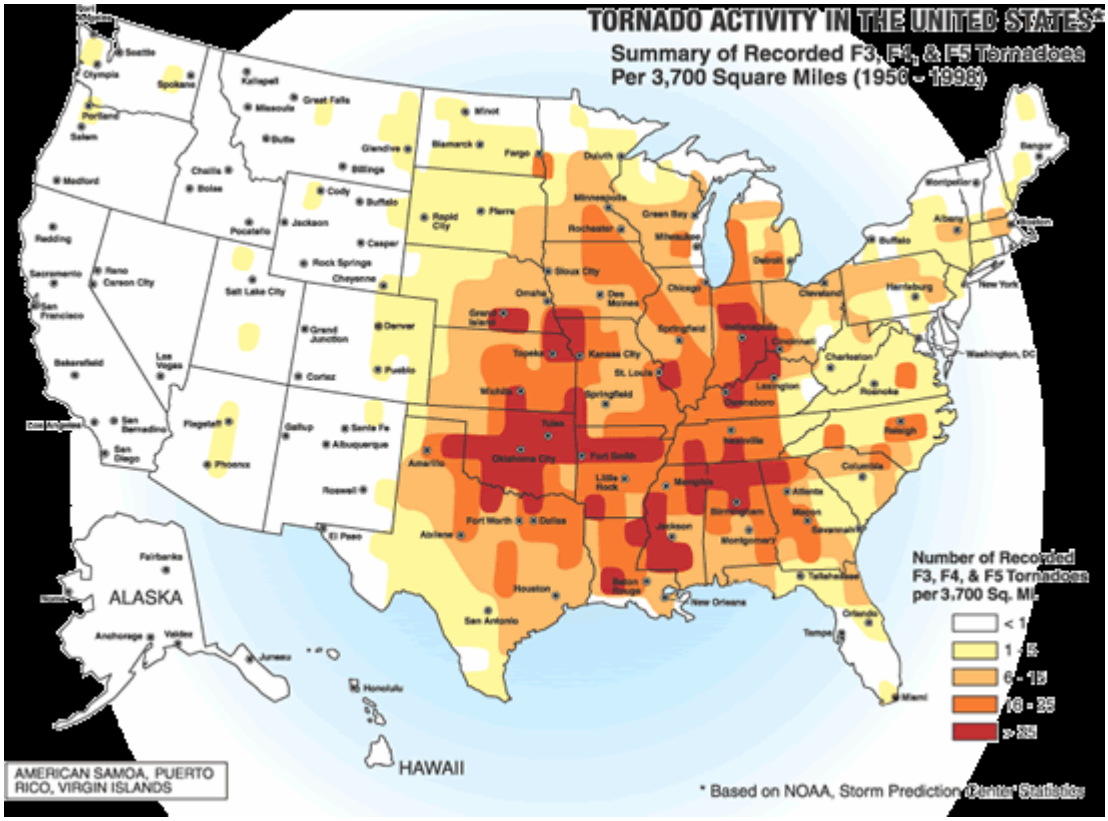


Figure 8. Tornado Activity in the United States

Source: http://www.fema.gov/plan/prevent/saferoom/tsfs02_torn_activity.shtm

In the US. Over the past 25 years, more than 100 federal disaster declarations included damage associated with tornadoes. On April 3, 1974, 148 tornadoes in 13 states killed 315 people and is the largest recorded tornadic event in history.

Tornado Types. The magnitude of a tornado is categorized by the damage pattern (i.e. path) and wind velocity, according to the Fujita-Pearson Tornado Measurement Scale. This scale is the only widely used rating method with the aim to validate classification by relating the degree of damage to the intensity of the wind.

Table 13. Fujita Scale for Tornadoes

Type	MPH	General Description
F1	73 - 112	Moderate Damage - Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113 - 157	Considerable Damage - Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
F3	158 - 206	Severe Damage - Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207 - 260	Devastating Damage - Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261 - 318	Incredible Damage - Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: FEMA State and Local Mitigation Planning How-To-Guide: Understanding Your Risks

Tornado Facts:

a. Worldwide, annually about 1,000 tornadoes are generated by severe thunderstorms.

b. Earthquake-induced fires and wildfires may also produce tornadoes.

c. Powerful tornadoes have lifted and moved objects weighing more than 300 tons a distance of thirty feet and have tossed homes greater than 300 feet way from their foundations.

d. The path of a single tornado can be dozens of miles long, but tornadoes rarely last longer than 30 minutes.

3.2. Profiling Hazards

The following section profiles historical occurrences of those natural hazards most likely to affect Winnebago County and its jurisdictions. Due to the County's climate, and geographical setting, the area is vulnerable to a wide array of natural hazards that threaten life and property.

These Hazard Profiles have been created using the best available data from a variety of resources, including but not limited to the National Climatic Data Center (NCDC), National Weather Service (NWS), Winnebago GIS (WinGIS), Illinois State Water Survey, Illinois State Climatology Center, FEMA Hazard Mapping website, local agencies and newspaper articles, and the approved Illinois State Hazard Mitigation Plan.

The following table represents the past declared disasters as provided by FEMA for the Winnebago County area.

Table 14. Winnebago County Declarations – All Types

Year	Date	Disaster Type	Disaster Number	Funding Received
1967	04/25	Tornadoes	227	$1,244,136.00
1973	04/26	Severe Storms and Flooding	373	$76,321,299.00
1974	06/10	Severe Storms and Flooding	438	$31,304,953.00
1979	01/16	Blizzards and Snowstorm	3068	$58.082.881.00
1993	07/09	Severe Storms and Flooding	997	$354,864,293.00
1996	07/25	Severe Storms and Flooding	1129	$240,427,229.00
1999	01/08	Severe Winter Storm	3134	$40,624,371.00
2001	01/17	Severe Winter Storm	3161	$22,791,787.00
2006	12/29	Severe Winter Storm	3269	$ 483,256.18
2007	08/30	Severe Storms and Flooding	1722	$ *Pending
			TOTAL	**$826,144,205.18**

*The Presidential Declaration for the 2007 Flood pending. Future updates of the plan will contain the final amount received.

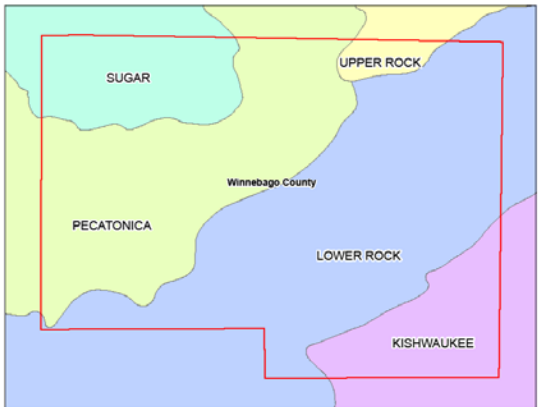
3.2.1. Area Climate and Local Geography

Area Climate. Illinois' climate is described as "typically continental with cold winters, warm summer, and frequent short fluctuations in temperature, humidity, cloudiness, and wind directions". Climate is controlled by two main factors. They are the sun and the weather systems. In his paper 'Climate of Illinois', Mr. Jim Angel, State Climatologist, explains how these different 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." In the northern portion of the state, where Winnebago County and its jurisdictions are located, the temperatures for the Summer season are: 10 days at or about 90°F, with average highs in the 80's and lows in the 60's and the temperatures for the Winter season are: 140 days at or below 32°F, with average highs in the 30's and lows in the teens.

Precipitation averages are: "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."

County Watersheds. Winnebago County crosses 5 watersheds. They are the Upper Rock, Pecatonica, Sugar, Lower Rock, and thee Kishwaukee.

Figure 9. Winnebago County Watersheds



Winnebago County has several major stream systems: Coolidge Creek, Dry Creek, East Fork Mill Creek, Fuller Creek, Grove Creek, Hungry Run, Keith Creek, Killbuck Creek, Kilburn Creek, Kinnikinnick Creek, Kishwaukee River, Madigan Creek, Manning Creek, McDonald Creek, Middle Creek, Mill Creek, Mill Race, Mud Creek, Otter Creek, Pecatonica River, Pink Creek, Raccoon River, Randalls Creek, Rhule Creek, Rock River, Sugar River, Sumner Creek, Trimble Run, Tunnison Creek, and Willow Creek. The land drained by each of these streams is called a "watershed."

County Topography. The land area of Winnebago County is approximately 514 square miles with roughly 5.5 square miles inundated by surface waters. Nearly 470 stream miles of mapped floodplains were recently adopted and became effective in September, 2006 as part of Winnebago County's Digital Flood Insurance Rate Map (DFIRM) update. The County is situated in the Young Till Plains section of the Central Lowlands Province of the Interior Plains. The topography is gently rolling ground moraine, with occasional eskers, Karnes, marginal moraines, and outwash.

3.2.2. Profiles by Hazard Type

The following sections provide a "profile" of each identified hazard in the Winnebago County area. This portion of the plan identifies the following information for each hazard:

- A risk factor table that summarizes the overall risk.
- A description of each identified hazard and potential impact.
- Historical background on each identified hazard and a brief description of known events.
- Probable future occurrences section explaining the likelihood of another occurrence happening in the future based upon an annual occurrence ratio derived from the total number of events divided by the time of record.
- Profile maps, if applicable, of the locations and areas affected by Hazard events.

•

Hazard Risk Factor Table Key	
Period of Occurrence	The normal time of year when a hazard occurs.
Number of Events to Date	The number of past events reported to the National Climatic Data Center (NCDC) between 1950-2007.
Annual Chance Probability Ratio	The number of past events divided by time of record.
Warning Time	The amount of time available for shelter to be taken given the natural hazard event.
Potential Impacts	Impacts typically associated with a particular natural hazard
Cause Injury or Death	The number of Injuries or deaths reported to the NCDC.
Potential Facility Shutdown	The timeframe that a facility could be out of service due to a natural hazard event.

3.2.2.1. Drought Profile

Table 15. Summary of Drought Risk Factors

Period of occurrence	Summer months or extended periods of no precipitation.
Number of Events to date: 1950-2007 (National Climatic Data Center)	9
Annual Chance Probability Ratio	0.16
Warning time	Weeks
Potential Impact(s)	Activities that rely heavily on high water usage may be impacted significantly, including agriculture, tourism, wildlife protection, municipal water usage, commerce, recreation, electric power generation, and water quality deterioration. Droughts can lead to economic losses such as unemployment, decreased land values, and Agro-business losses. Minimal risk of damage or cracking to structural foundations, due to soils.
Cause injury or death	None Reported
Potential Facility Shutdown	None Reported

Background. All areas in the United States are at risk of drought at any time of the year. Winnebago County and its jurisdictions are located in Division 1, the Northwest division, according to the 9 climate zones set for Illinois. Drought is measured by the Palmer Drought Severity Index shown below.

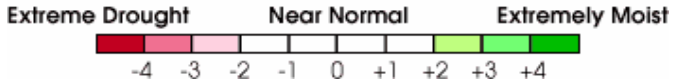


Table 16. Palmer Classification System (PDSI)

Inches of rain	Description
-2.0 in to -2.99 in	Moderate drought
-3.0 in to -3.99 in	Severe drought
-4.0 in or less	Extreme drought

Source: National Oceanic and Atmospheric Association (NOAA)

Drought History. Research includes: local National Weather Service, National Climatic Data Center, and newspaper archives. Winnebago County lies within the Northwest region, Division 1, along with 11 other counties. See Appendix G for National Climatic Data Center events for Winnebago and surrounding counties.

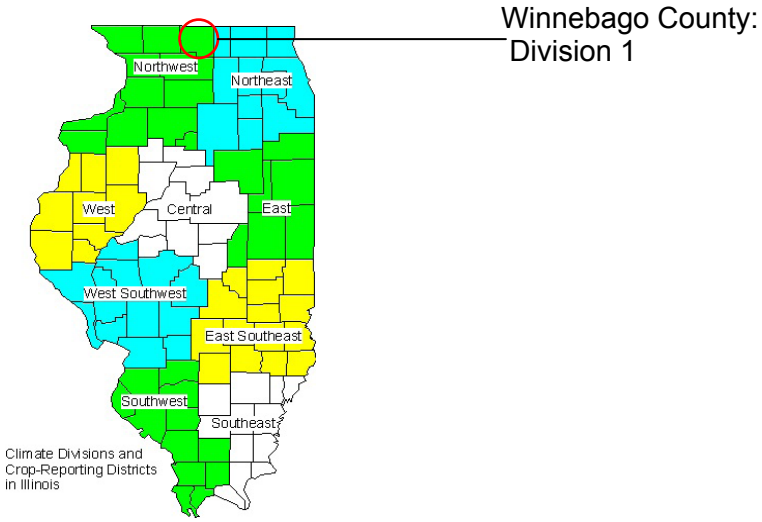


Figure 10. Illinois State Climate Divisions

Source: http://www.sws.uius.edu/hilites/drought/figures/DTFFigures2005707.pdf#fig4

The following are some historic drought events from Winnebago County:

- July 30, 1930: Three successive heat waves in the region, relieved by little rain, have increased the effects felt from what has been described as the worst general drought in thirty years. A combination of heat and drought, which experienced corn growers say is the worst in at least seventeen years, is adding daily to the toll of crop damage in almost every section of the state. Corn crops in Illinois have been destroyed and farmers are reporting losses anywhere from 25 to 60 percent of their crop. Pastures have burned brown, which has lead to a loss of feed. Many corn crops have had burned tassels which causes problems in pollination of the corn crop. The losses in the area are very serious and each hot, dry day increases the damage amounts. (Source: The Chicago Daily Tribune)

- Rockford Illinois experienced the driest spring, summer and fall period from March 2005 to November 2005. This time frame of extreme drought lead to many problems felt throughout Northern Illinois. Much of Illinois was declared an agriculture disaster by early August, several water wells dried up, and

outdoor water restrictions/bans were put in place. Not only did the agriculture business suffer, but the Illinois River levels were too low to handle barges to carry the crops that did survive. In total, Winnebago County received 17.83 inches of rain for the 9 month period which breaks the old record or 18.98 inches from 1971.

Table 17. Largest Drought on Record

Location	Record Type	New Record Date	New Record	Old Record	Old Record Date
Rockford, Illinois	Driest Spring, Summer and Fall on Record	March-November 2005	Total precipitation: 17.83. inches	Total Precipitation: 18.98 inches	March-November 1971; Normal March-November rainfall is 31.82 inches

Source: http://www.ncdc.noaa.gov/oa/climate/research/2005/nov/novemberext2005.html

- May 7, 1992: Very dry weather prevailed in northern and central Illinois during the month. Records for the driest May were set in Chicago, Moline, and Rockford. (Source: www.crh.noaa.gov/ilx/trivia/septriv.php)

Below is the National Weather Service data for Division 1 outlining all moderate to severe droughts, occurring during 1895–2006. This data is for the whole division, which includes Winnebago County, but is not distinguished by county or jurisdiction. The table below is classified by drought intensity and displays all the months within the given year that had a PDSI rating classified of at least a moderate drought. The monthly PDSI for the entire year were then added together and divided by the number of months to find the average PDSI for the year. The monthly PDSI shown in the table are only the months resulting in a negative, and therefore drought stage number.

Table 18. Palmer Drought Records for Winnebago County

Year	Average PDSI	Palmer Drought Severity Index Rank	Month/PDSI
1934	-4.22	Extreme Drought	**01**:-4.83 **02**:-5.25 **03**:-6.10 **04**:-6.58 **05**:-7.81 **06**:-7.97 **07**:-7.56 **08**:-7.38
1940	-3.97	Severe Drought	**01**:-4.26 **02**:-4.34 **03**:-4.82 **04**:-4.43 **05**:-4.32 **06**:-3.83 **07**:-3.97 **08**:-3.28 **09**:-3.77 **10**:-3.62 **11**:-3.57 **12**:-3.47
1956	-3.23	Severe Drought	**01**:-3.20 **02**:-3.13 **03**:-3.75 **04**:-3.32 **05**:-2.90 **06**:-3.75 **07**:-2.88 **08**:-2.16 **09**:-2.85 **10**:-3.61 **11**:-3.51 **12**:-3.75
1964	-3.81	Severe Drought	**01**:-5.03 **02**:-5.22

Table 18. Palmer Drought Records for Winnebago County

Year	Average PDSI	Palmer Drought Severity Index Rank	Month/PDSI
			03:-4.69 **04**:-3.75 **05**:-3.75 **06**:-3.29 **07**:-2.93 **08**:-3.15 **09**:-2.99 **10**:-3.62 **11**:-3.73 **12**:-3.99
1914	-2.44	Moderate Drought	**01**:-2.25 **02**:-2.09 **03**:-2.13 **04**:-2.39 **05**:-2.35 **06**:-2.17 **07**:-2.73 **08**:-3.02 **09**:-2.22 **10**:-2.22 **11**:-2.85 **12**:-2.89
1931	-2.67	Moderate Drought	**01**:-4.41 **02**:-4.85 **03**:-4.99 **04**:-5.06 **05**:-4.38 **06**:-4.45 **07**:-4.69 **08**:-4.63
1957	-2.25	Moderate Drought	**01**:-3.59 **02**:-3.09 **03**:-2.81 **04**:-2.45 **06**:-2.42 **09**:-2.15
1988	-2.39	Moderate Drought	**06**:-2.84 **07**:-4.03 **08**:-4.32 **09**:-4.75 **10**:-4.43 **11**:-4.01 **12**:-4.07
1989	-2.0	Moderate Drought	**01**:-4.13 **02**:-3.97 **03**:-3.76 **04**:-3.83 **05**:-3.96 **06**:-3.81 **07**:-3.65
2005	-2.52	Moderate Drought	**06**:-2.88 **07**:-3.57 **08**:-3.65 **09**:-3.99 **10**:-4.61 **11**:-4.85 **12**:-5.29
2006	-2.91	Moderate Drought	**01**:-2.25 **02**:-2.09 **03**:-2.13 **04**:-2.39 **05**:-2.35 **06**:-2.17 **07**:-2.73 **08**:-3.02 **09**:-2.22 **10**:-2.22 **11**:-2.85 **12**:-2.89

Source: http://www.cdc.noaa.gov/cgi-bin/Timeseries/timeseries1.pl

Drought Impacts. High temperatures, prolonged high winds, and low relative humidity can aggravate drought conditions. In Winnebago County, a second effect of a drought could be low river levels on the Rock River, Pecatonica River, and Kishwaukee River. Low water can become unsafe for navigation in some areas. During periods of drought, some activities that rely heavily on high water usage may be impacted significantly. These activities include agriculture, tourism, wildlife protection, municipal water usage, commerce, recreation, wildlife preservation, electric power generation, and water quality deterioration. Droughts can lead to economic losses such as unemployment, decreased land values, and Agro-business

losses. In addition, there is minimal risk of damage or cracking to structural foundations, due to soils.

Probable Future Occurrences. There is no jurisdictional dollar loss information associated with this hazard and are classified on a regional basis, therefore, impact cannot be determined for a particular jurisdiction within the county. The probability of future occurrences calculation was based on drought type and number of past occurrences found in the table above. The probability is 0.16% chance per year and could affect any jurisdiction within the county. Future updates should include information on a jurisdictional basis when possible.

Table 19. Drought Probability

Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
Any Drought	9	0.16

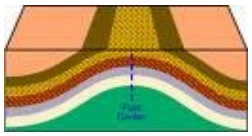
3.2.2.2. Earthquake Profile

Table 20. Summary of Earthquake Risk Factors

Period of occurrence	Year round
Number of Events to date:1950-2007	2
Annual Chance Probability Ratio	0.04
Warning time	None
Potential Impact(s)	Impacts human life, health, and public safety. Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Can cause severe transportation problems and make travel extremely dangerous. Aftershocks and secondary events could trigger landslides, releases of hazardous materials, and/or dam and levee failure and flooding.
Cause injury or death	Injury and risk of multiple deaths.
Potential Facility Shutdown	Months

Background. Illinois has had at least 250 known earthquakes occur over the past 2 centuries. Of these, at least 31 have caused some kind of damage. No faults run through Winnebago County, however there is one anticline. An anticline is a geological fold structure, in the form of an arch, with older rock and materials residing in the center of the fold and younger strata on top of the succession. It is formed as a result of compressional forces acting on a horizontal plane on rock strata. When rocks bend they create folds, and when they fracture they can produce faults. Consequently, many folds are associated with faults.

Figure 11. Antidine Structure



Source: http://www.physicalgeography.net/fundamentals/images/anticline.gif

In Winnebago County there is one anticline called the Pecatonica Anticline and is located south, southeast of the Village of Pecatonica. This structure is a small anticline about 10km long, 3km wide, with about 9m of vertical uplift. Although no earthquakes have occurred due to the anticline, there is a possibility of events in the future.

According to the State of Illinois Hazard Mitigation plan, "Earthquakes in Illinois originate within the crust at depths of 1 to 20 km. The 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 over, and cause damage over, an area 15 to 20 times larger than California earthquakes with similar magnitudes."

Although there have been 250 earthquakes in Illinois, very few of them have caused damage or injuries. Most of the events, 80%, have happened in southern Illinois and ten percent have occurred in both the central and northern portions of the state.

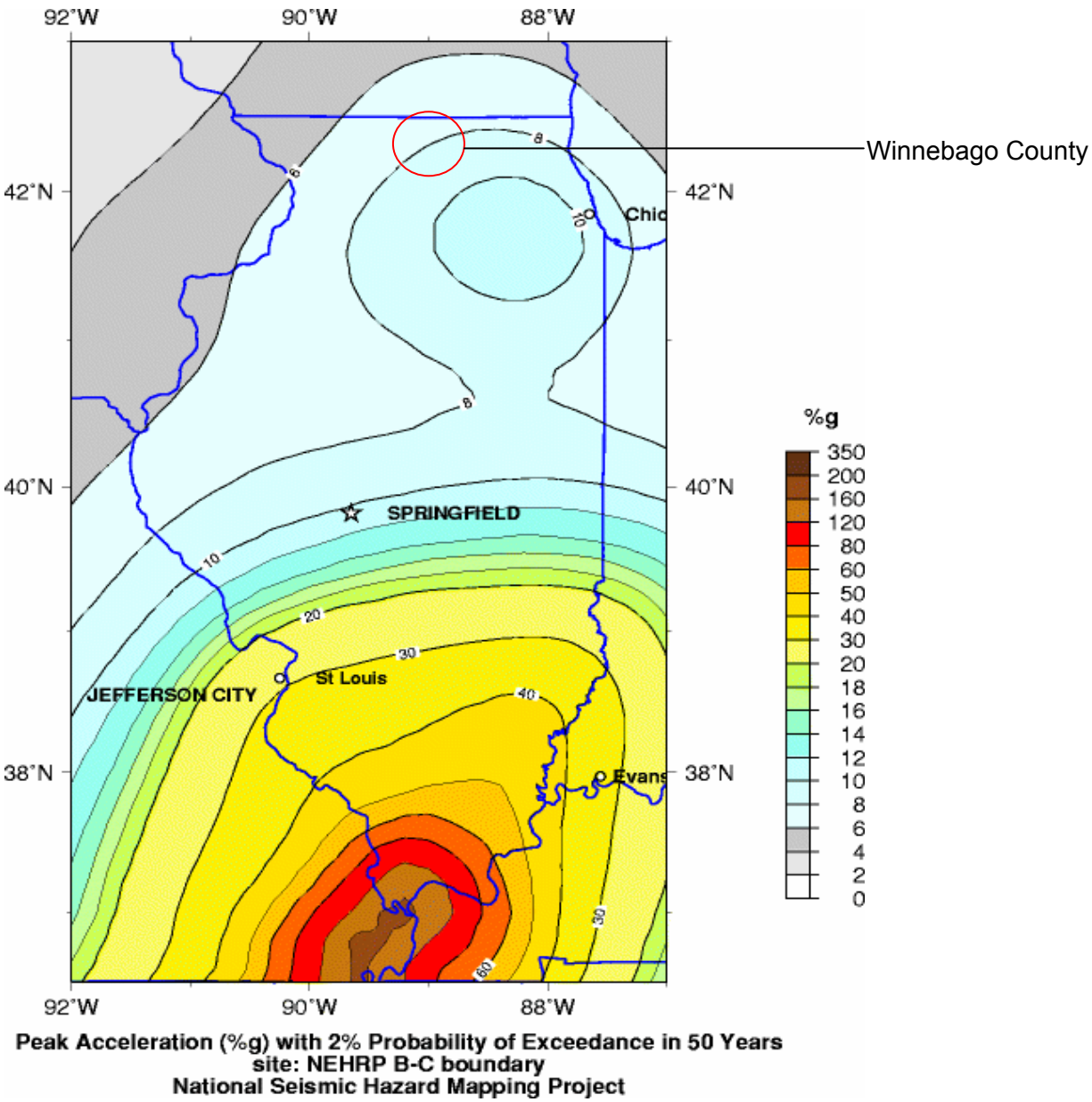


Figure 12. USGS Peak Ground Acceleration Map

Source: http://earthquake.usgs.gov/regional/states/illinois/hazards.php

The map above shows earthquake risk for Illinois given as maximum accelerations with a 2% probability of being exceeded within a 50 year time period–or a 1 in 2,500 chance of it occurring in any year. Winnebago County is located in the 6%g zone.

Earthquake History. One of the largest earthquakes to occur in Illinois was located in Northern Illinois on June 26, 1909. The exact location is unknown, but the most damage occurred in Aurora. The type of damage that correlated with this event were things such as overturned stoves, fallen chimneys, gas lines broken, and a fire started. Houses were also jostled out of alignment near Beloit, Wisconsin which is not too far from Winnebago County.

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. Although felt over a very large area, the intensity VI area is much smaller than the 1909 earthquake.

September 15, 1972: Cracks in chimneys, tombstones, elevated water tanks, and plaster occurred at Amboy (Lee County), south of Rockford following an earthquake with a magnitude of 4.0 and an intensity of VI. Chimney and plaster cracks were observed at Holcomb, northeast of Amboy, in Ogle County. Also felt in Indiana, Iowa, Michigan, Minnesota, Missouri, Ohio, and Wisconsin.

A series of small earthquakes have occurred in and around Winnebago County, one in 1909 with a magnitude of 5.2 and another in 1912 with a magnitude of 3.6. (Source: http://www.isgs.uiuc.edu/research/earthquake-hazards/pdf-files/qk-fct-damag.pdf)

Earthquake Impacts. Earthquakes can impact human life, health and public safety. Power outages, utility damage, infrastructure damage, structural damage, fire outbreaks, damaged or destroyed critical facilities, and hazardous material releases are all potential impacts following an earthquake event. Travel to any location can be extremely dangerous after an earthquake and should be avoided if possible.

Aftershocks and secondary events often occur after the main quake and could trigger landslides, release of hazardous materials, and dam failure (which could lead to flooding). The greatest hazard potential for earthquakes exists in highly populated areas, because these areas tend to have a greater number of tall buildings that are more vulnerable to seismic impact. Buildings and infrastructure (roads, bridges, etc.) built during the 1920s to 1960s are also generally more susceptible to seismic movement than newer construction.

Probable Future Occurrences. There is no jurisdictional dollar loss information associated with this hazard and are classified on a regional basis, therefore, impact cannot be determined for a particular jurisdiction within the county. The probability of future occurrences calculation was based on number of past events over a period of years. Earthquakes events do not have a specific area or size that is usually associated with them. Therefore, all areas located within Winnebago County have a probability of being affected by a seismic event. There have been 253 earthquakes over the past 2 centuries with 26 occurring in Northern Illinois.

Table 21. Earthquake Probability

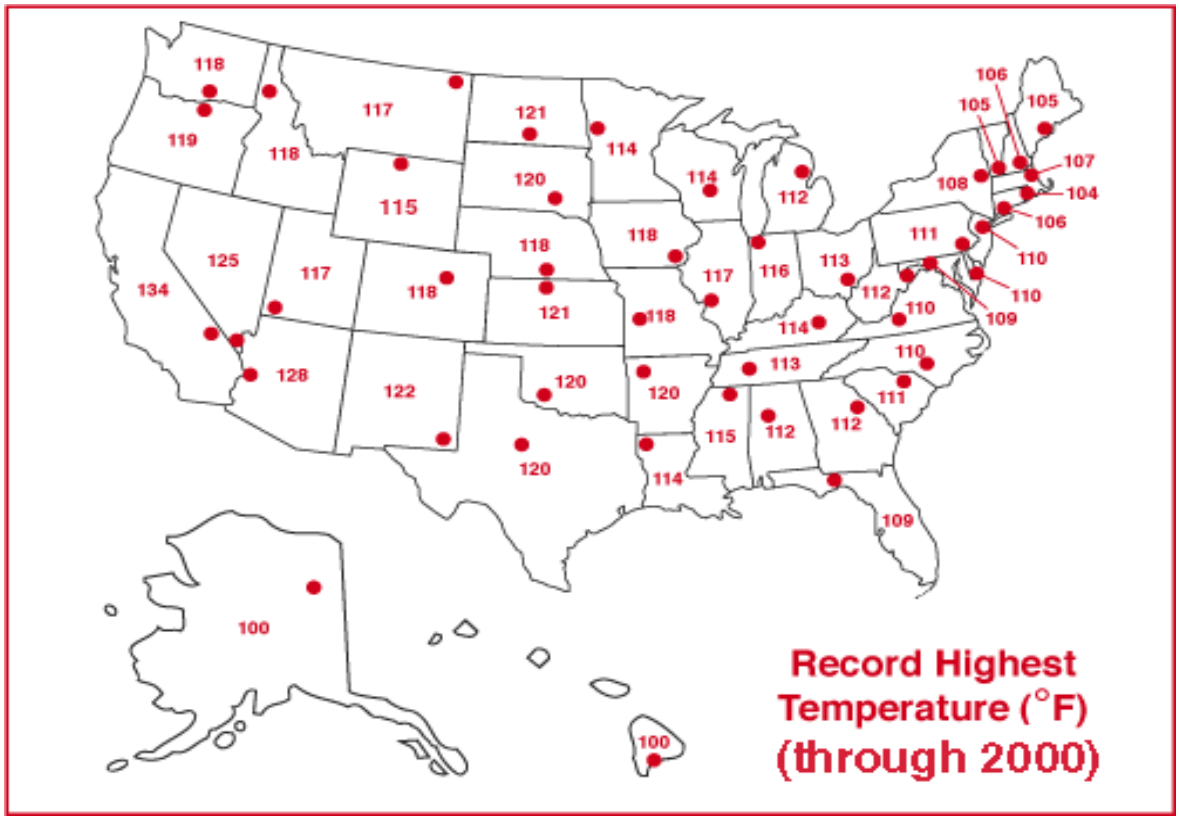
Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
Earthquake in Winnebago County	2	0.04

3.2.2.3. Extreme Heat Profile

Table 22. Summary of Extreme Heat Risk Factors

Period of occurrence:	Summer
Number of Events to-date: 1950-2007 (National Climatic Data Center)	3
Annual Chance Probability Ratio	0.05
Warning time:	Several days of high temperatures hovering over 90 degrees.
Potential Impact(s):	Public health and safety, especially the elderly. Heavy use of water and electrical facilities due to air conditioners, fans, etc.
Cause injury or death	Injury and risk of multiple deaths
Potential Facility Shutdown	None Reported

Background. FEMA defines extreme heat as: temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. A temperature of 90°F is significant in that it ranks at the "caution" level of NOAA's Apparent Temperature chart even if humidity is not a factor. Excessive heat is a possibility in any part of the United States, and generally the more continental the climate, the greater the seasonal and diurnal fluctuations.



Extreme Heat History. The following excerpt was taken from the National Climatic Data Center: "An intense heat wave affected northern Illinois from Wednesday, July 12 through Sunday, July 16, 1995." According to National Weather Service Records, the heat wave tied or broke several temperature records at the Rockford and Chicago recording stations. What set this heat wave apart from others was the extremely high humidity. Dew point temperatures peaked in the lower 80s on Wednesday the 12th and Thursday the 13th, and were generally in the middle and upper 70s through the rest of the hot spell. The combined effects of several days of high temperatures, high humidity, intense July sunshine and light winds took their toll. Five hundred and eighty-three people died as a result of the heat in Chicago metropolitan area.

Table 23. Regional High Temperatures

Date	Minimum Temperature	Maximum Temperature	Mean Temperature
July 11, 1995	73°F	90°F	82°F
July 12, 1995	76°F	98°F	87°F
July 13, 1995	81°F	106°F	94°F
July 14, 1995	84°F	102°F	93°F
July 15, 1995	77°F	99°F	88°F
July 16, 1995	76°F	94°F	85°F

Source: http://www.sws.uiuc.edu/atmos/statecli/General/1995Chicago.htm

Commonwealth Edison, which provides much of northern Illinois and virtually all of the Chicago metropolitan area with power, had record demands for electricity on July 12-14, 1995. Several roads buckled from the heat. Many of the people who died in the Chicago

Metropolitan Area were elderly people living alone in homes or apartments with no air conditioning. Emergency officials found people in homes with room temperatures of 120 degrees or higher. Five deaths occurred in Winnebago County, specifically in the City of Rockford due to this extreme heat event.

- October 2, 1922: Strong southerly winds brought very warm air from the Gulf region into Illinois. Rockford reached 91 degrees, which stands as the city's October warmest temperature. The heat wave across the region persisted through the 5th. (Source: http://www.crh.noaa.gov/ilx/trivia/octtriv.php)

- July 30, 1930: Three successive heat waves relieved by little precipitation in the area have lead to an extremely bad situation for immature crops in the central states. With each hot, dry day the amount of damage to the crops increases in the area with corn being the most affected. Most farmers are reporting a loss of 25 to 60 percent of their crop due to heat and drought. (Source: Chicago Daily Tribune)

See Appendix G for NCDC events for Winnebago and surrounding areas for past extreme heat events.

Extreme Heat Impacts. Main impacts are to public health and safety, especially the elderly. Additionally, heavy use of utilities (electric and water) cause a strain on the system due to air conditioners, fans, and water usage, etc. Extreme heat can lead to the following impacts:

- Heat stroke, heat exhaustion and heat cramps are the major human risks from
- Exposure to extreme heat
- Extreme heat diminishes water supplies and increases fire danger
- Roads, bridges, and railroad tracks may suffer damage from extreme heat conditions

Probable Future Occurrences. There is no jurisdictional dollar loss information associated with this hazard and are classified on a regional basis, therefore, impact cannot be determined for a particular jurisdiction within the county. The probability of future occurrences calculation was based on number of past events over a period of years. There have been three historic events reported to the National Climatic Data Center (NCDC) for extreme heat in Winnebago County over the past 57 years resulting in a 5.3% chance of an extreme heat event occurring during any year.

Table 24. Extreme Heat Probability

Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
Extreme Heat Event Resulting in Death	3	0.05

Extreme heat events do not have a specific area or size that is usually associated with them. Therefore, all areas located within Winnebago County have a probability of being affected by one or more extreme heat events.

3.2.2.4. Flood Profile

Table 25. Summary of Flood Risk Factors

Period of occurrence:	Rock and Pecatonica River: March through June Flash floods: anytime, but primarily during Summer rains
Number of Events to-date: 1950-2007(National Climatic Data Center)	21
Annual Chance Probability Ratio	0.37
Warning time:	River flooding: 3-5 days Flash flooding: minutes to hours Out-of-bank flooding: several hours/days
Potential Impact(s):	Impacts human life, health, and public safety. Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Can lead to economic losses such as unemployment, decreased land values, and Agro-business losses. Floodwaters are a public safety issue due to contaminants and pollutants.
Cause injury or death	Injury and risk of multiple deaths
Potential Facility Shutdown	Weeks to months

Background. Flooding is probably the most significant natural hazard in Illinois. Major flooding occurs within the state almost every year and it is not unusual for several floods to occur in a single year. Flood damage in Winnebago county results from three types of floods. The Rock River floods are generally associated with spring snowmelt along with ice jams and rain storms. Floods on the Pecatonica River system are usually due to spring snowmelt in combination with rainfall. Floods on the smaller tributaries of the Rock River in Winnebago County are caused by intense thunderstorms which occur most often in late summer and early fall.

The majority of flood problems in the county occur in the areas near the Cities of Rockford and Loves Park. Flood peaks have increased due to the recent urbanization of uplands. Urbanization often is accompanied by floodplain filling or encroachment which reduces the channel's transport capacity and increases rainfall runoff. Increased floods on the main channels lead to backwater effects on tributaries which increases the overall flood hazard. The following table lists rivers, streams, and creeks identified by the Planning Committee as sources of flooding in Winnebago County.

Table 26. Rivers, Creeks, and Streams in Winnebago County

Beaver Run	Kent Creek	Martin Creek	Rhule Creek
Bebbs Creek	Kent Creek, South Branch	Mcdonald Creek	Rock Creek
Blacks Creek	Killbuck Creek	Mill Creek	Rock River
Canal Creek	Killburn Creek	Mosquito Creek	Spring Creek
Coolidge Creek	Kinnikinnick Creek, North Branch	Mud Creek	Sugar River
Dry Creek	Kinnikinnick Creek, South Branch	North Canal Creek	Summer Creek
Dry Creek, South Branch	Kishwaukee River	Otter Creek	Timothy Creek
Fuller Creek	Kishwaukee River, South Branch	Pecatonica River	Tunnison Creek
Grove Creek	Loves Park Creek	Pink Creek	Turtle Creek
Hungry Run	Madigan Creek	Raccoon Creek	Willow Creek
Keith Creek	Manning Creek	Randal Creek	

Flood History. The following table shows the flood-related Presidentially Declared Disasters for Winnebago County.

Table 27. Winnebago County Declarations - Floods

Year	Date	Disaster Type	Disaster Number	Funding Received
1973	04/26	Severe Storms and Flooding	373	$76,321,299
1974	06/10	Severe Storms and Flooding	438	$31,304,953
1993	07/09	Severe Storms and Flooding	997	$354,864,293
1996	07/25	Severe Storms and Flooding	1129	$240,427,229
2007	8/30	Severe Storms and Flooding	1722	*Pending
			TOTAL	**$702,917,774.00**

*The Presidential Declaration for the 2007 Flood pending. Future updates of the plan will contain the final amount received.
Source: http://www.peripresdecusa.org/mainframe.htm

Illinois as a state has had 30 presidentially declared disasters from 1950 – 2007 and 5 of those have occurred or affected Winnebago County and its jurisdictions.

Flood History by Jurisdiction. Flood history information was primarily obtained from the Winnebago County Flood Insurance Study report, 2006, unless otherwise noted.

a. *Village of Cherry Valley*: The source of flood problems in Cherry Valley results from high waters of the Kishwaukee River. Flood events such as the July 3, 1978 over bank flood, damaged property and caused the evacuation of houses along Mill Road. Ground water rising simultaneously with the Kishwaukee River has also lead to water penetration into basements in the area.

   Madigan Creek overflows its banks during severe storm events. Since the floodplain within Cherry Valley is now vacant, no current flood problems exist.

However, the land located within the floodplain is zoned for commercial development and therefore a future flood hazard exists.

b. *Village of Durand*: Low lying areas of Durand are subject to periodic flooding from the North Branch Otter Creek and the South Branch Otter Creek. Floods on these creeks generally are caused by spring snowmelt combined with rainfall or intense rainfalls occurring in the late spring and summer.

c. *City of Loves Park*: The development within the City of Loves Park is increasing urban runoff which, in turn, causes increase to peak discharges along South Ditch, the Main Drainage Ditch, and Ditch Number 3. Residential and industrial development on the natural floodplains has reduced the conveyance capacity of these ditches. Many existing bridge openings are too small to handle even a 10 year flood. Severe flooding occurred along the ungaged drainage ditches in 1973 and 1974. The return period of the storm causing the 1973 flood is estimated to be 100 years. The 1974 flooding was caused by wet soil conditions and succession of small storms. The right bank of Ditch Number 3 is higher than the adjacent floodplain in the vicinity of Forest Hills Road and Alpine Road. The bank would be overtopped in a 500 year flood; shallow flooding would result northward to approximately Maple Road. Mitigation actions were taken in 2005 when a flood control project was completed with the USACE to improve the "main ditch" flooding creek in Loves Park. The project added ponds and increased storage.

d. *Village of Machesney Park*: Flood peaks in Machesney Park have been increased by recent urbanization of uplands. Increased floods on the main channels cause backwater effects up tributaries, thus increasing the flood hazard. Additional flood runoff is unable to flow through restricted culverts and bridges, which often are clogged with sediment and debris from new construction. In Machesney Park, businesses and commercial structures are generally located higher than residences and incur relatively minor flood damages.

e. *Village of Pecatonica*: Low lying areas of Pecatonica are subject to periodic flooding from the Pecatonica River. Floods on the Pecatonica River system generally are caused by spring snowmelt combined with rainfall or intense spring rainfall. Gage records on the Pecatonica River at Freeport, Illinois (No. 05435500) indicate the largest flood of record occurred on March 16, 1929 with a discharge of 18,400 cubic feet per second and an estimated recurrence interval of 25 years based on the 1976 hydrologic analysis. More recent floods of magnitude occurred in 1959, 1960, 1975 and 1993.

   No data on past floods are available on the Unnamed Tributary to Pecatonica River. Most of the flooding on this tributary is caused by heavy local rainfall and is often increased by the coincidence of frozen ground.

f. *City of Rockford*: Most of the business and commercial developments in the City of Rockford are located along the Rock River. Twelve bridges cross the Rock River and serve are major connections between eastern and western portions of Rockford. These bridges are not seriously obstructed by debris in the summer months; however, in the late winter and early spring, snowmelt and heavy rainfall combine to produce major floods on the Rock River which often

are associated with ice jams. The degree of flow obstruction may increase drastically when the ice cover breaks up, especially in the cases where flood crest elevations are above the low-steel elevations of bridges. When this occurs, the bridge decks become natural barriers to ice movement and the effective flow area under the bridge is reduced. The ice-laden flow and the jammed bridge cause backwater effects. Severe backwater effects also can occur at channel bends, islands, and low head dams which are potential sites for ice accumulations and jams.

The current level of development in the flood plain of the Rock River does not constitute a serious degree of encroachment. However, judging from present trends and projected growth in this area, careful floodplain management should be considered to assure preservation of adequate floodway for future floods without adverse effects on existing facilities.

Both Spring Creek and Keith Creek are subject to severe flooding resulting from inadequacy of the natural channel and accessory drainage structures to accommodate the high rates of runoff from intense thunderstorm precipitation. Channels are inadequate to handle the sudden surge of runoff, and discharges are retarded by the poor flow characteristics, inadequate capacity, and poor maintenance of culverts which cross the streams.

Flood damage along Kent Creek occurs largely in the urban area. Continuing urbanization of the basin, inadequate bridge and culvert openings, poorly maintained channels and meandering creek patterns are major contributions to Kent Creek's flooding problem.

The large flood occurred on Kent Creek in 1952. It had a peak discharge of 4,330 cubic feet per second and a recurrence interval of 150 years. The residential area along the North Kent Creek was inundated up to the eaves of the houses. Industrial and commercial establishments along both North and South Kent Creek suffered severe damage. Several plants were forced to cease operation until floodwaters receded. Roads crossing Kent Creek within the city limits were closed to traffic during the flood. The Horace and Arthur Avenue bridges were unserviceable after the flood due to flood damage. The total flood damage from the 1952 flood in the Kent Creek system watershed, adjusted to 2003 costs, is estimated at $10,500,000.

On July 3, 1978, four hundred families were forced to leave their homes due to flooding of the region. It was reported that 25% of Winnebago County was flooded due to the rains that caused four rivers to overflow their banks. This lead to washed out roads and bridges in the area, 10,000 acres of destroyed crops, and approximately $6 million dollars of damage in the Rockford area.

A slow moving low pressure system triggered scattered thunderstorms across northern Illinois during the afternoon of September 4, 2006. A series of slow moving storms moved into and sat over the east side of Rockford. As much as 5 to 10 inches of rain fell in a localized area, while less than ¾ inch fell nearby at the airport. The heavy rain produced severe flooding of Keith Creek in the late afternoon and early evening. Hundreds of basements were flooded and 15 homes were left uninhabitable. Streets and parking lots were flooded and cars

were submerged in water. Damage was estimated around $20 million. (Source: www.crh.noaa.gov/ilx/trivia/septriv.php)

Northern Illinois was struck with an intense storm on August 8, 2007 that lead to flash flooding and caused quite a bit of damage in the area. Residents of Rockford continued to check their sump pumps after flash floods soaked basements, closed highways, and forced at least 40 people to evacuate their homes. At the height of the storm, nearly 50,000 Commonwealth Edison customers were without power in northern Illinois. Homes on at least a dozen streets were affected and the water was 5 feet deep on some streets. Nearly 7 inches of rain fell in Rockford during this one event, but more rain occurred on the following afternoon, leading to more devastation and damage. The damage in Rockford alone was estimated to be $20 million dollars and was eventually received a presidential disaster declaration. (Source: The Chicago Tribune)

g. *Village of Rockton*: Low lying areas of Rockton are subject to periodic flooding from the Rock River, which floods mainly in the spring due to snowmelt. The largest Rock River flood occurred March 30, 1916 with a discharge of 32,500 cubic feet per second at the Rockton gage. Using regional discharge- frequency curves derived from the hydrologic analysis in 1976, the 1916 flood had a recurrence interval of approximately 35 years. The Rockton gage is on the right bank approximately 750 feet downstream from State Highway 75, and is 1.0 mile downstream from Pecatonica River. The minimal development within the floodplain is mostly residential, with a small portion of industrial development.

h. *Village of Roscoe*: Low lying areas of the Village of Roscoe are subject to periodic flooding from the Rock River, North Kinnikinnick and South Kinnikinnick Creeks. No data on the past floods is available for North and South Kinnikinnick Creeks in the Village of Roscoe.

i. *City of South Beloit*: Most of the City of South Beloit is situated on the floodplains of the Rock River and Turtle Creek. Most reaches of Turtle Creek have banks higher than adjacent floodplains. Although the city may be protected from most floods, extensive areas could be flooded when flood stage exceeds bank elevations.

Floods on Turtle Creek are often associated with high stages caused by ice jams. The highest recorded flood stage on Turtle Creek in South Beloit occurred during January 1938 and had an ice-affected stage corresponding to the 500-year flood. At the Clinton, Wisconsin gage approximately twelve miles above South Beloit, the peak discharge that occurred during this flood was 10,700 cubic feet per second, which would correspond to a recurrence level of about 40 years. Another large flood occurred on Turtle Creek in April 1973. This discharge corresponds to a flood having a recurrence of about 200 years. Damages incurred during the 1973 flood were estimated to be as high as five million dollars. Nearly 60 percent of the city was inundated; some areas as much as three feet of water. Other ice-affected floods occurred on the Turtle Creek in South Beloit in 1946, 1948, and 1949.

Flash Flood: On Interstate 90, near mile marker 66 near Riverside Blvd, cars were stalled out due to high water on August 25, 2006. At 4:53 pm, over 2 inches of rain was reported in the past hour at Route 251 and Bypass 20. Three

inches of rain was measured 7 miles northeast of Rockford Airport. Storm total rainfall amounts included 4.60 inches in Belvidere in Boone County, 2.20 inches in Pecatonica, 1.96 inches in Roscoe and 1.96 inches in Shirland. (Source: http://www.encyclopedia.com/doc/1G1-158211095.html)

j. *Village of Winnebago*: The village of Winnebago does not contain a flood hazard area; therefore flood will not be assessed for vulnerabilities within this jurisdiction.

See Appendix G for a listing of Winnebago County area flooding events recorded by the National Climatic Data Center.

Flood Impacts. Flooding impacts human life, health, and public safety. Community-wide the potential for risks is severe for: utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Flooding also can lead to economic losses such as unemployment, decreased land values, and Agro-business losses. Flood damages include residential damage, possible business and commercial damage, school closures, and agriculture damages. Most damage occurs to residence when severe floods gain direct entrance to basements, sub ground living areas, and lower level garages through surface runoff. This type of flooding causes some minor structural damage. Flood waters rarely enter first floor levels by direct runoff, but when it does occur, major structural and content damage occurs. Flood waters also enter sanitary sewer systems through street manholes, which creates major cleanup problems and health hazards, although there is usually no structural damage.

The second major type of flood damage is the flooding of the highways and local roads. Considerable costs are incurred by delays in travel. Flooded roads could impede emergency vehicles and emergency response teams along with other vehicles providing necessary goods and services. Schools are often closed due to lack of access.

A third type of flood is neighborhood degradation caused by frequent flooding. These flood events lead to this subtle damage by declining property values.

Probable Future Occurrences. For each river, engineers assign statistical probabilities for different sized floods. This is done to rate the size of the flood compared to other floods that have or may occur.

The National Flood Insurance Program (NFIP) and the Illinois Department of Natural Resources (IDNR) use this same baseline flooding probability. This is the baseflood, also known as the 100-year flood. FEMA describes the 100-year flood as “The flood elevation that has a one percent chance of being equaled or exceeded each year. Thus the 100- year flood could occur more than once in a relatively short period of time. The 100-year flood is used by the NFIP as the standard for floodplain management and to determine the need for flood insurance.” (Source: www.fema.gov/plan/prevent/fhm/fq_fld03.shtm)

Another level of risk that is used is the 500-year flood, or 0.20% chance of occurring in any given year. FEMA describes the 500 year flood as deeper than a 100-year flood and covering a greater area, but less likely to occur than a 100-year event. Given that this level of flooding is less likely to occur, it is the standard used for critical facility protection.

Table 28. Flood Probability

Time Period	Flood Size			
	10-year	25-year	50-year	100-year
1 Year	10%	4%	2%	1%
10 Years	65%	34%	18%	10%
20 Years	88%	56%	33%	18%
30 Years	96%	71%	45%	26%
50 Years	99%	87%	64%	39%

Notice that during the course of a 30 year mortgage, a homeowner has a 26% chance of experiencing a 100-year flood and a 96% chance of experiencing a 10-year flooding event. The odds of experiencing a 10-year event are nearly guaranteed.

The following maps show the flood hazard area per jurisdiction within Winnebago County.

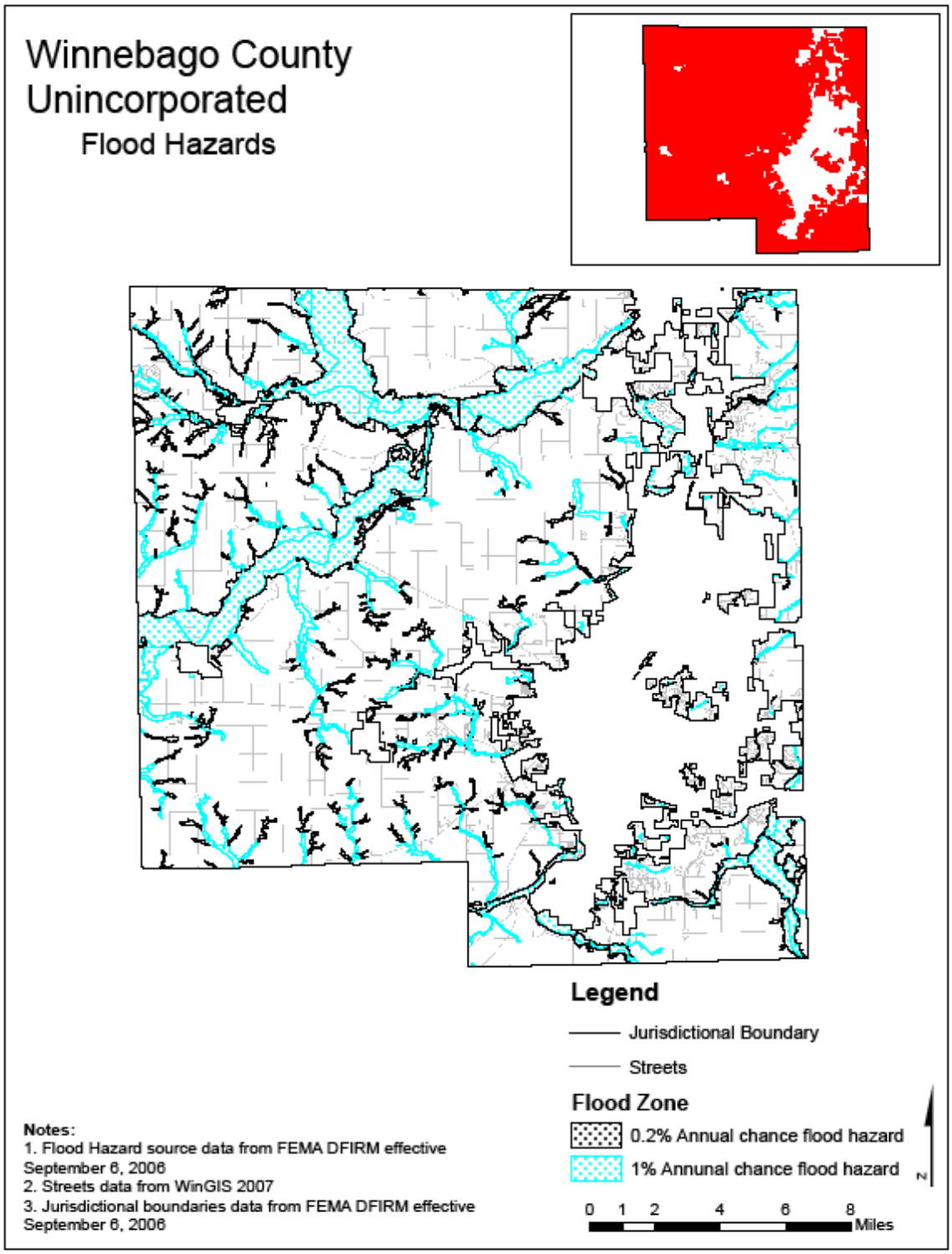


Figure 13. Winnebago County Unincorporated Flood Hazards

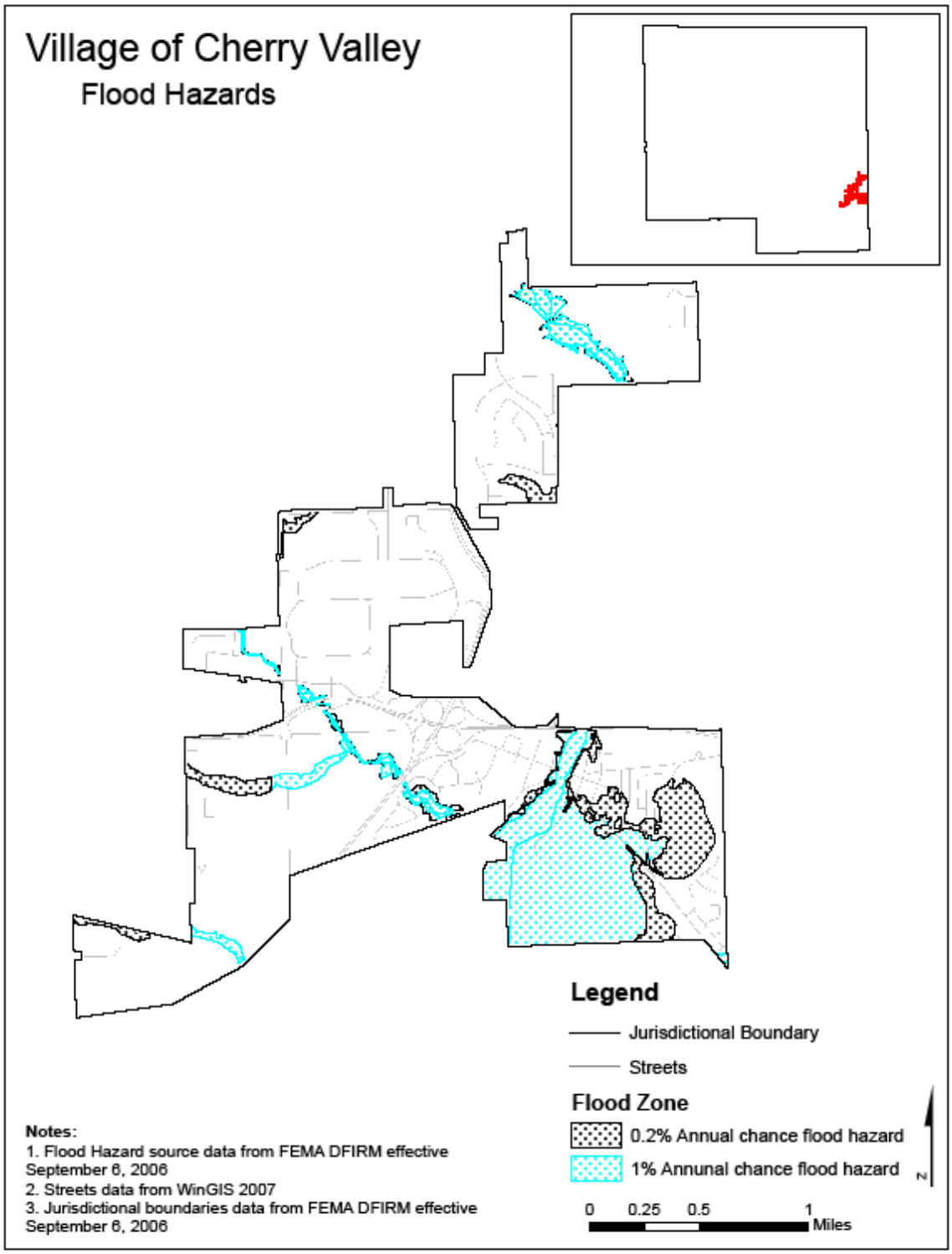


Figure 14. Village of Cherry Valley Flood Hazards.

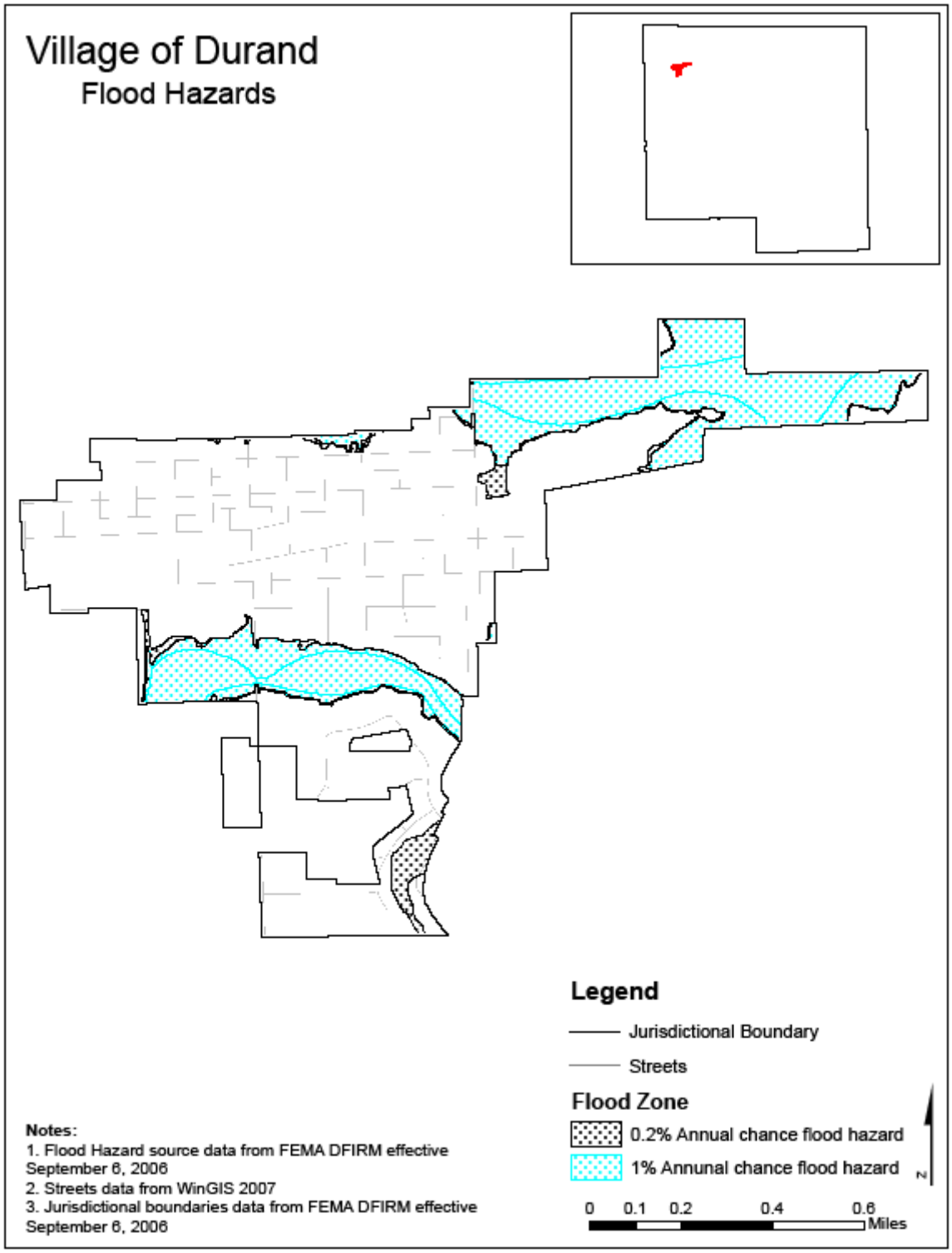


Figure 15. Village of Durand Flood Hazards

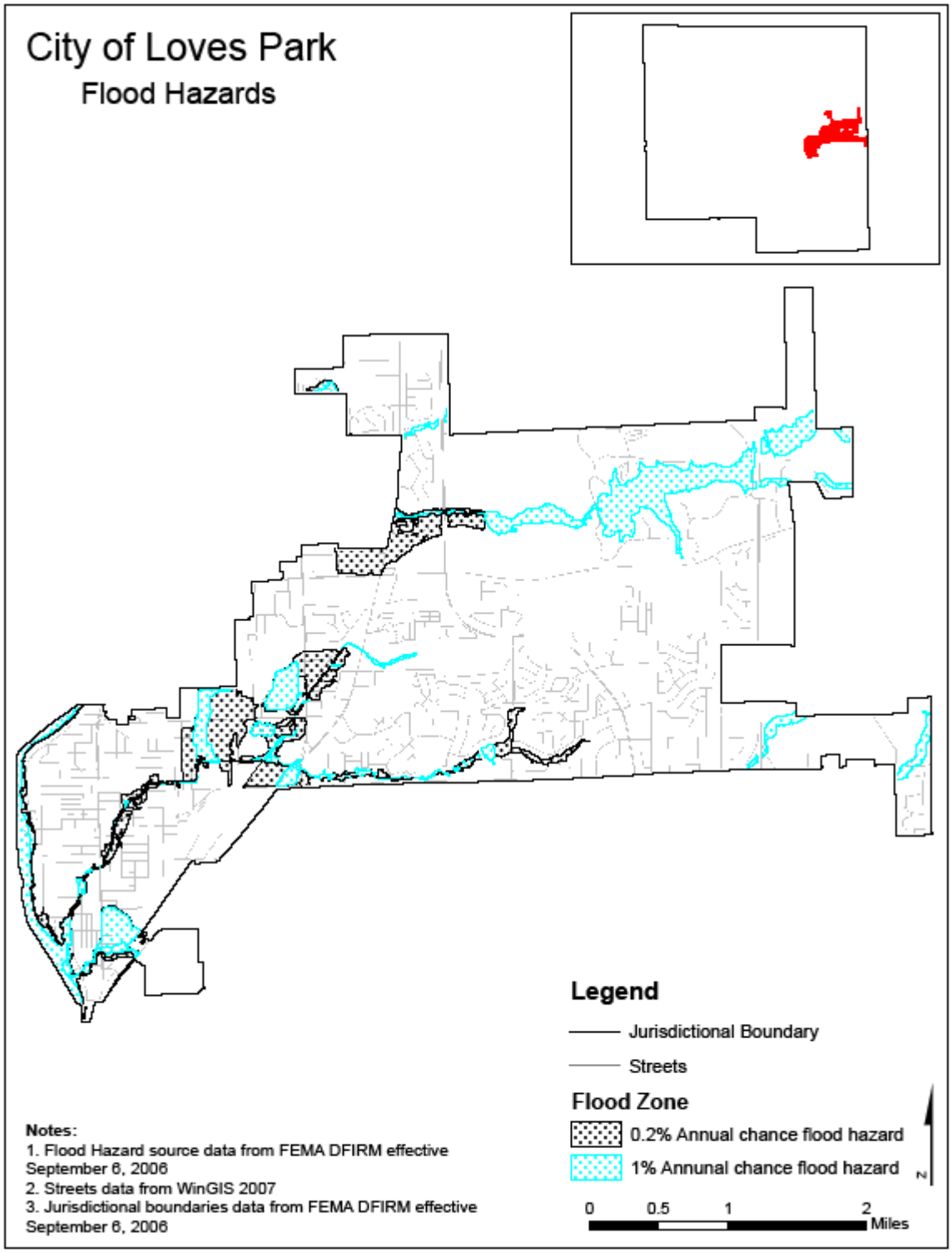


Figure 16. City of Loves Park Flood Hazards

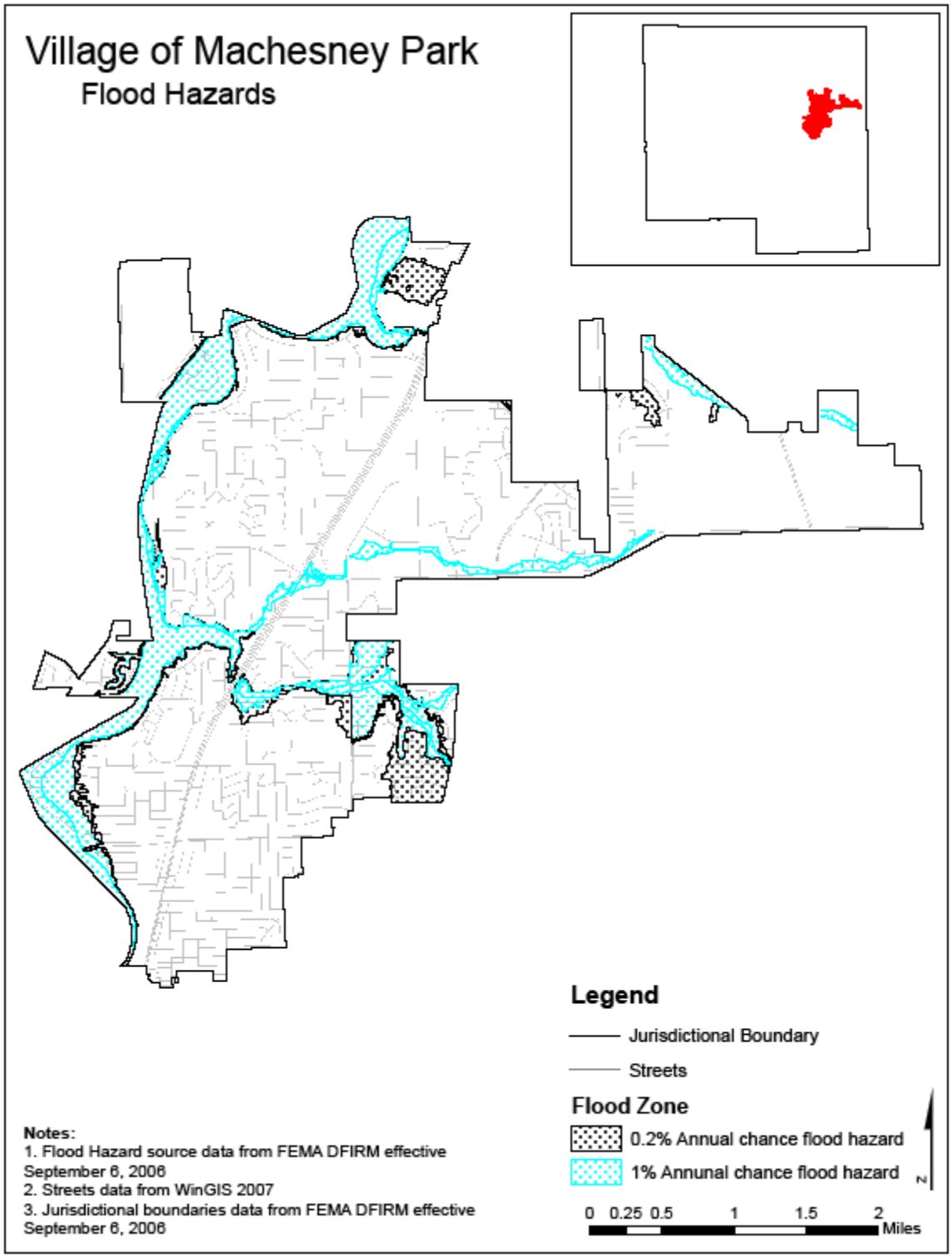


Figure 17. Village of Machesney Park Flood Hazards

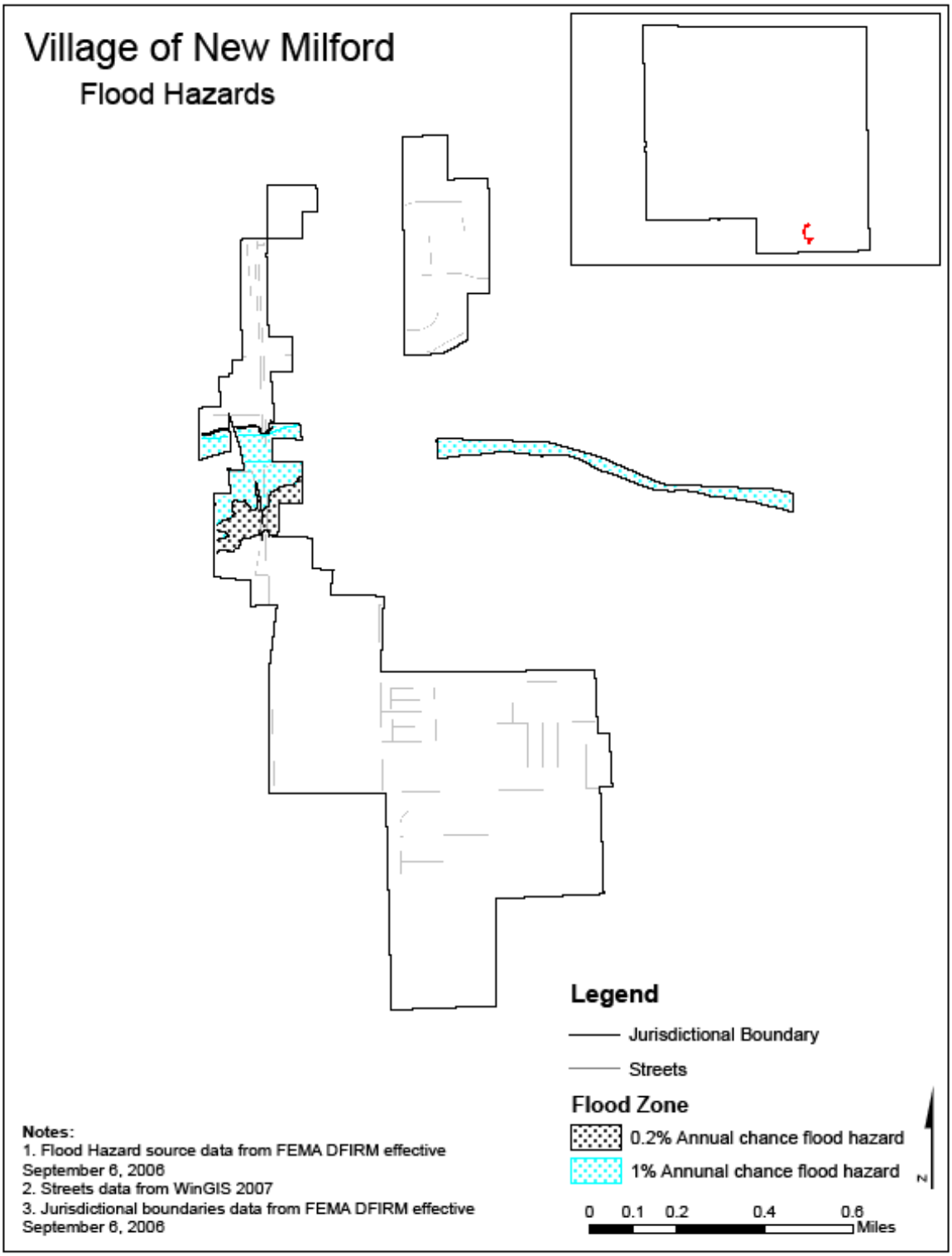


Figure 18. Village of New Millford Flood Hazards

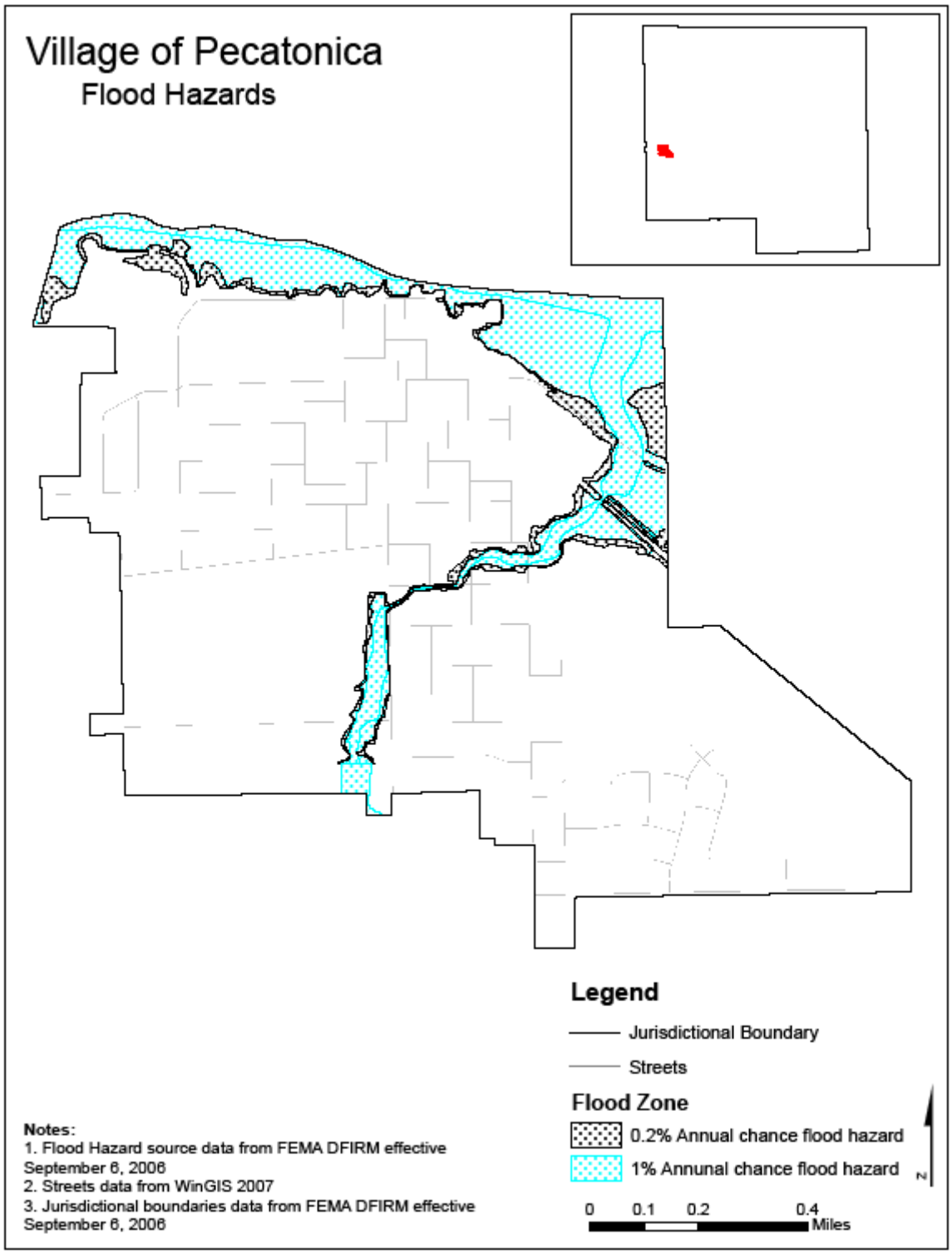


Figure 19. Village of Pecatonica Flood Hazards

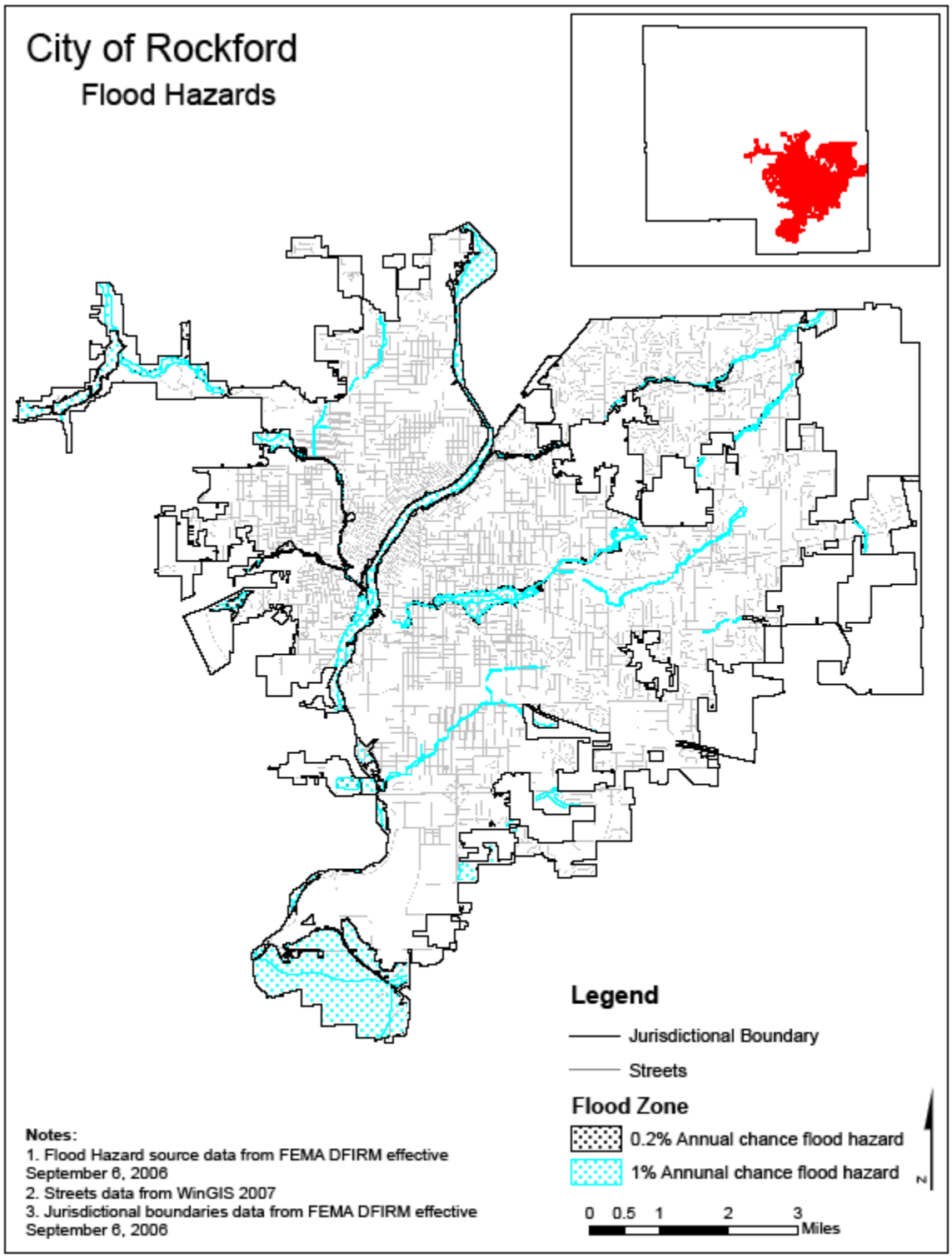


Figure 20. City of Rockford Flood Hazards

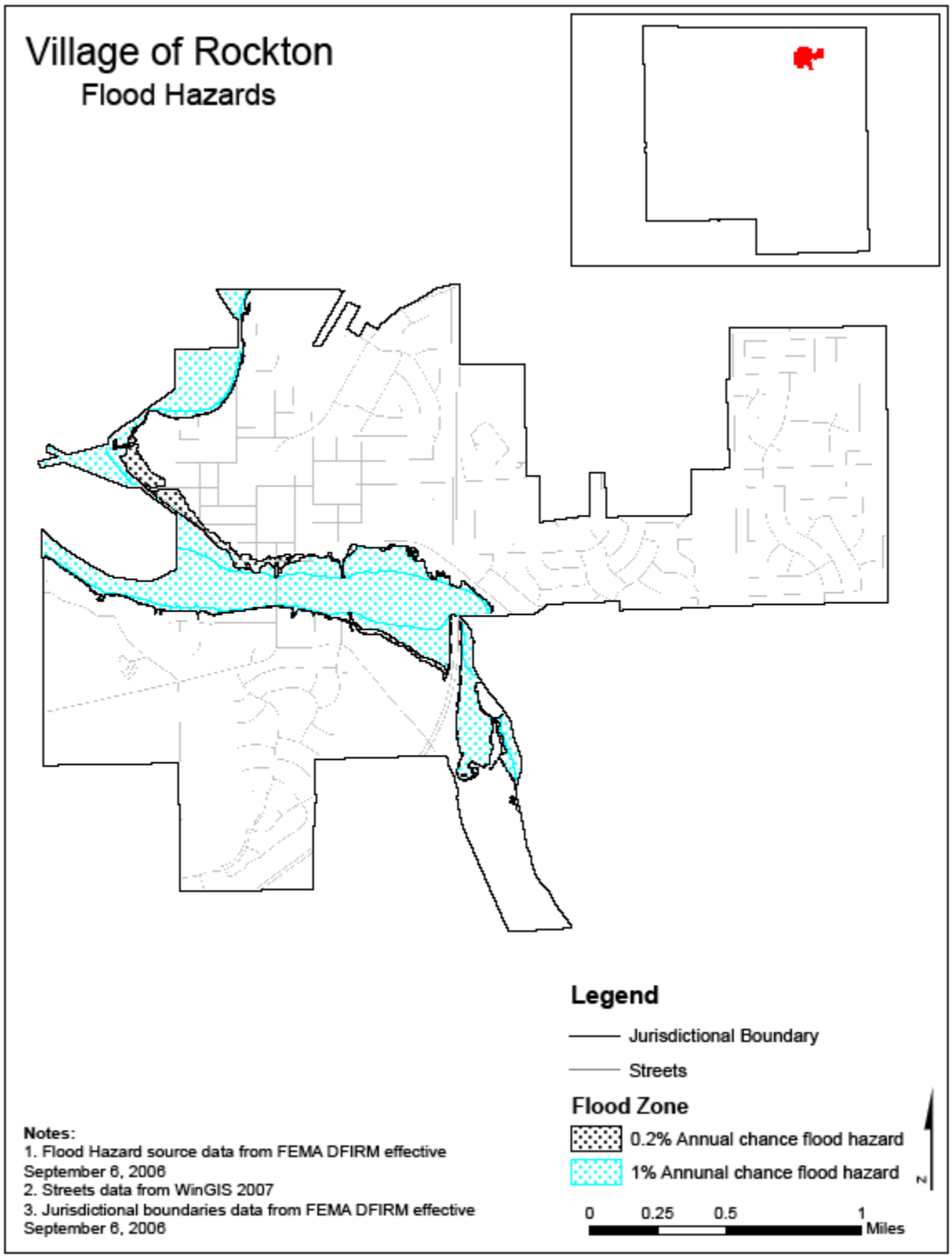


Figure 21. Village of Rockton Flood Hazards

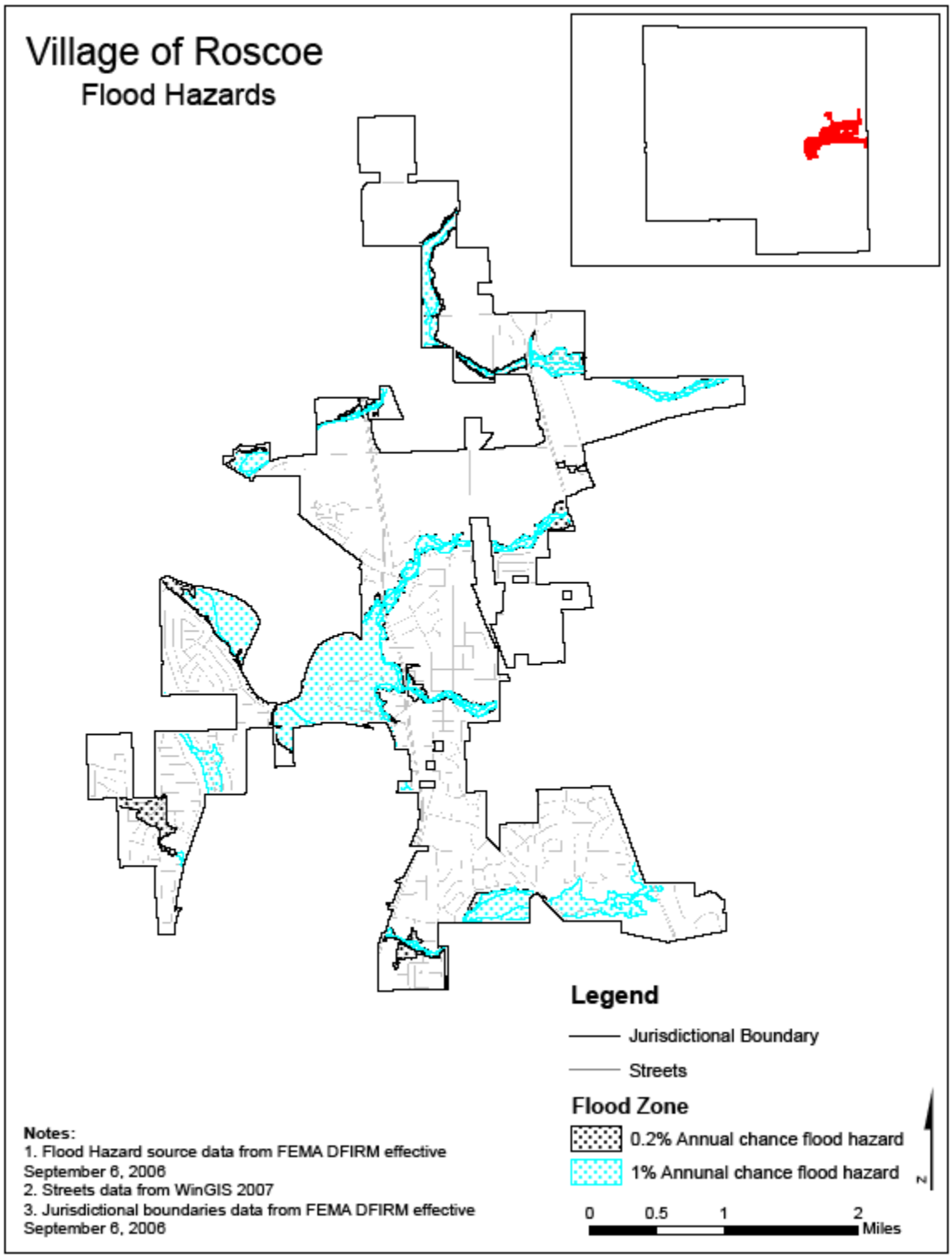


Figure 22. Village of Roscoe Flood Hazards

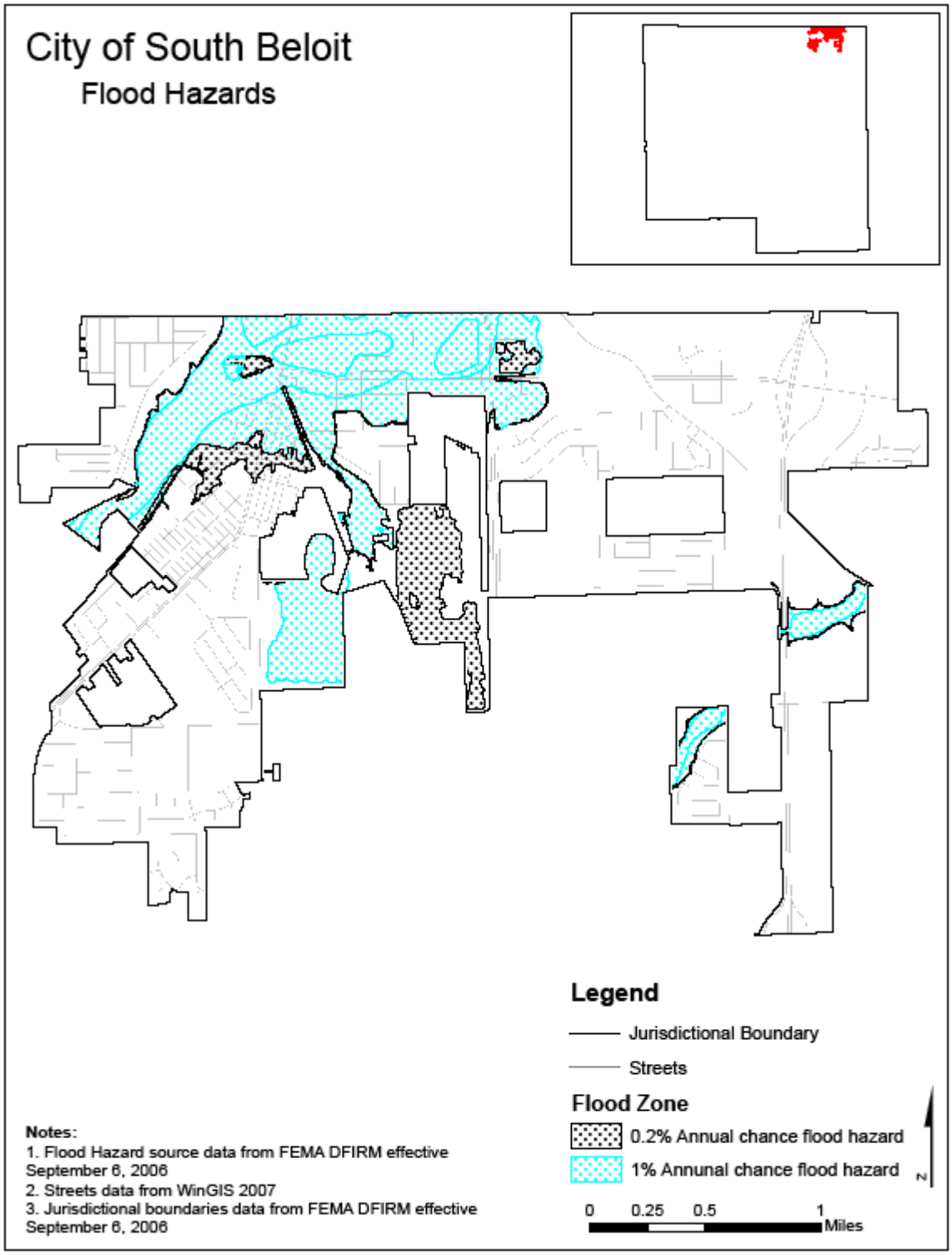


Figure 23. City of South Beloit Flood Hazards

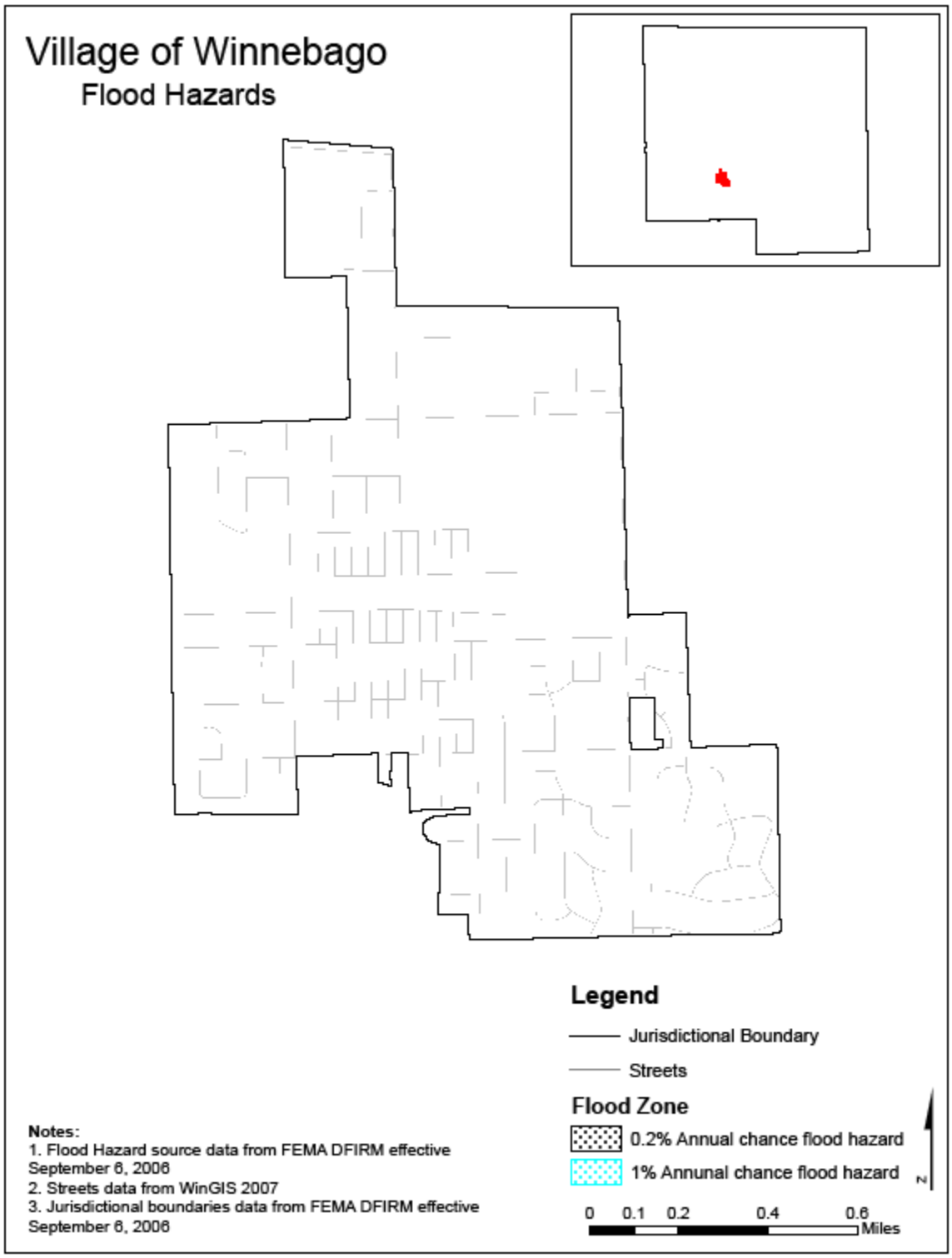


Figure 24. Village of Winnebago Flood Hazards

3.2.2.5. Severe Storm Profile (Lightning, Hail, and High Wind)

Table 29. Summary of Severe Storms Risk Factor

Period of occurrence:	Spring, Summer and Fall
Number of Events to-date: 1950-2007 (National Climatic Data Center-NCDC)	Thunderstorms NCDC: 118 Lightning NCDC: 2 Hail NCDC: 75
Annual Chance Probability Ratio	3.42
Warning time:	Minutes to hours
Potential Impact(s):	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, fire, damaged or destroyed critical facilities, and hazardous material releases. Impacts human life, health, and public safety.
Cause injury or death	Injury and risk of multiple deaths
Potential Facility Shutdown	Days to weeks

Background. The Midwest and Great Plains regions of the U.S. average between 40 and 60 days of thunderstorms per year. These two regions are prone to some of the most severe thunderstorms on Earth. Winnebago County is affected by severe thunderstorms more than any other hazard. These severe storms are often associated with heavy rain, lightning, hail, and high winds. Winnebago County typically experiences between 30 and 50 thunderstorm days per year. These storms are not bound to one particular geographic path; therefore all jurisdictions located within Winnebago County are vulnerable to this hazard. Appendix G provides the National Climatic Data Center information for Winnebago County and its jurisdictions for hail, lightning, and high wind events associated with severe storms.

The following map shows the average number of thunderstorm days per year for the Continental United States. Winnebago County lies within the 30 to 50 category for annual thunderstorms.

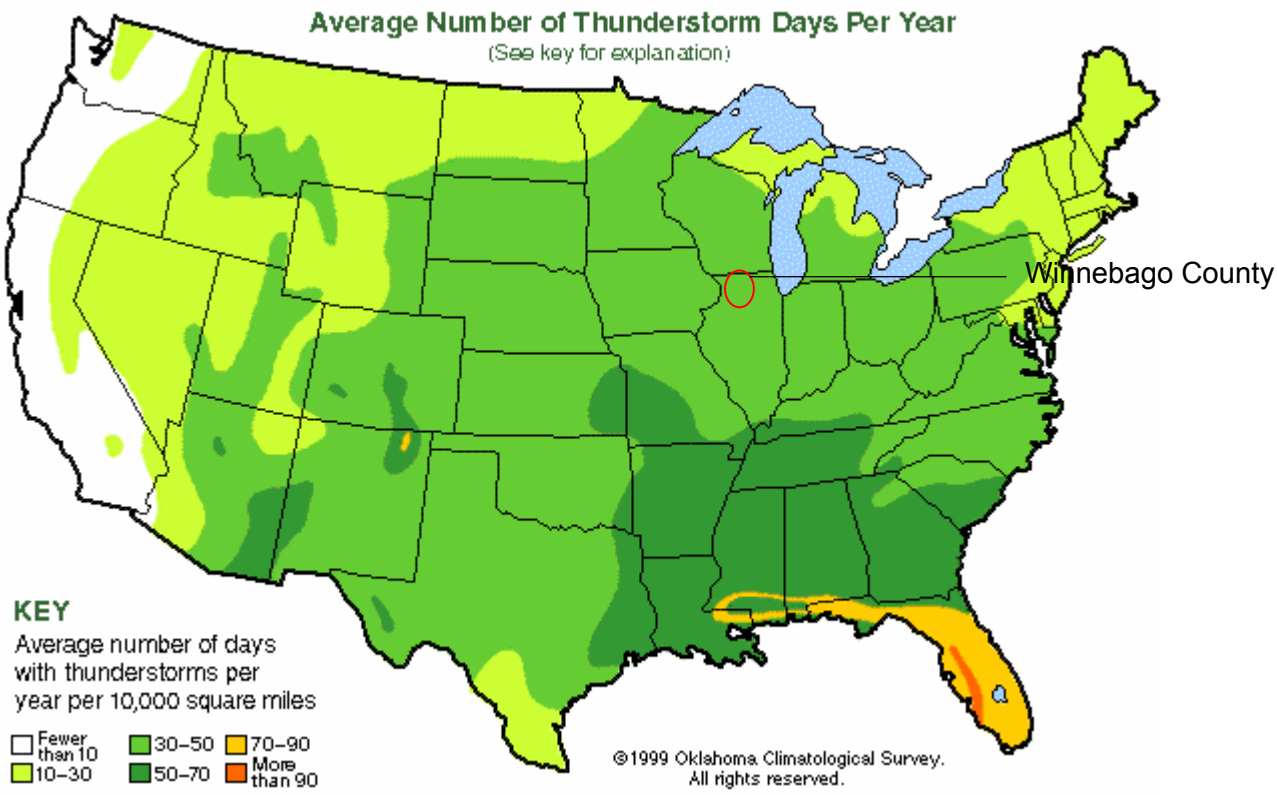


Figure 25. Average Number of Thunderstorm Days per year

Lightning Profile. In the United States, there are an estimated 25 million cloud-to-ground lightning strikes each year. The average deaths attributed to lightning strikes exceed those attributed to tornadoes. Lightning usually claims only one or two victims at a time and does not cause mass destruction of property, and because of this, it is underrated as a risk. Local data and National Climatic Data Center website archives document two lightning events for Winnebago County. The following is a description of a sample lightning event that caused injury or property damage.

On September 4, 2006 in Winnebago County, the roof of a house was struck by lightning. This led to the blow out of a television and started a fire. The fire caused significant damage to the house. Property damage was estimated at $50,000.

Hail Profile. The effects of large hailstorms can include minimal to severe property and crop damage and destruction. Most thunderstorms do not produce hail, and ones that do, normally produce only small hailstones not more than one-half inch in diameter. Local data and National Climatic Data Center website archives document 75 hail events from 1950 to 2007. The hail stones ranged from 0.75 inches to 3.00 inches in diameter

Severe Storm History. Winnebago County has received 5 presidential declarations for severe storm, as shown in the following table. The amount of money received from the August 2007 declaration is still pending due to the recent nature of the declaration and the new claims being filed each day for funding. Future updates of the plan will include the total amount received from this declaration.

Table 30. Winnebago County Declarations – Severe Storms

Year	Date	Disaster Type	Disaster Number	Funding Received ($)
1973	04/26	Severe Storms and Flooding	373	76,321,299
1974	06/10	Severe Storms and Flooding	438	31,304,953
1993	07/09	Severe Storms and Flooding	997	354,864,293
1996	07/25	Severe Storms and Flooding	1129	240,427,229
2007	08/30	Severe Storms and Flooding	1722	*Pending
			Total:	**702,917,774.00**

Source: http://www.peripresdecusa.org/mainframe.htm
*The Presidential Declaration for the 2007 Flood pending. Future updates of the plan will contain the final amount received.

a. July 17, 1873: Severe thunderstorms moved across Winnebago County on Tuesday the 17th. This storm contained severe winds which caused much destruction and "mammoth hailstones that devastated the fields of many farmers and the ripening fruit" (Source: Rockford Gazette). The hail stones were described as "simply enormous in size, something in the shape of a bird's eye, with a weight of 14oz in some cases" Crop losses are estimated to be $2,500 to $3000 per farmer. Property damage such as broken windows and sashes were reported due to the hail storm. One injury was reported when a hail stone hit a child on the hand and injured his forefinger. (Source: Rockford Gazette)

b. July 14, 1966: High winds ripped Rockford, blowing down trees and power lines which disrupted electric service for the area. Rock Cut State Park, northeast of Rockford, also was hit hard by high winds. (Source: The Chicago Tribune)

c. August 29, 1990: An unusual severe storm moved into Winnebago County from the north and brought with it severe weather. The storm registered a Level 6 on the radar, which is the highest reading possible. Within this storm were tornadoes, funnel clouds, golf-ball-size hail, and high winds. (Source: The Chicago Tribune)

d. June 18, 1998: Severe thunderstorms moved across a large portion of northern and central Illinois. Most of the damage occurred in the northeast part of the state, from Rockford to the Chicago area. Numerous trees and power lines were blown down and one person was injured when a tree fell on him.

e. July 5, 2003: At around 2 o'clock in the morning, microbursts caused major damage on both the East and West side of Rockford. Approximately 70,000 people were without power, with many on the West side suffering in the heat for weeks. It took months for the damage to be completely cleared, but because the storm struck so early in the morning there were no injuries or fatalities. (source: www.illinois.com/details/city.php?cityfips=1765000)

f. September 4, 2006: A slow moving low pressure system triggered scattered thunderstorms across northern Illinois during the afternoon. A series of slow moving storms moved into and sat over the east side of Rockford. As much as 5 to 10 inches of rain fell in a localized area, while less than ¾ inch fell nearby at the airport. The heavy rain produced severe flooding of Keith Creek in the late afternoon and early evening. (Source: www.crh.noaa.gov/ilx/trivia/septriv.php)

See Appendix G for past severe storms recorded by the National Climatic Data Center events for Winnebago and its jurisdictions.

Severe Storm Impacts. Due to the destructive nature of thunderstorms and lightning these events impact human life, health, and public safety. The community is at-risk for: utility damage and outages, infrastructure damage (transportation and communication systems), structural damage (specifically due to hail events), damaged or destroyed critical facilities, and hazardous material releases.

Probable Future Occurrences. There is no jurisdictional dollar loss information associated with this hazard and are classified on a regional basis, therefore, impact cannot be determined for a particular jurisdiction within the county. The probability of future occurrences calculation was based on number of past events over a period of years. There have been 118 historic thunderstorm/high wind events, 2 lightning events, and 75 hail events reported to the National Climatic Data Center (NCDC) for severe storm in Winnebago County over the past 57 years resulting in a 100% chance of a severe storm occurring during any year.

Table 31. Severe Storm Probability

Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
Thunderstorm and High Wind	118	2.07
Lightning	2	0.04
Hail	75	1.32
Any Severe Storm Event	195	3.42

3.2.2.6. Severe Winter Storm Profile

Table 32. Severe Winter Storms Risk Factors

Period of occurrence:	Winter
Number of Events to-date: 1950-2007 (National Climatic Data Center - NCDC)	22
Annual Chance Probability Ratio	0.39
Warning time:	Days for snow Minutes to hours for ice.
Potential Impact(s):	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities Can cause severe transportation problems and make travel extremely dangerous. Power outages, which results in loss of electrical power and potentially loss of heat, and human life. Extreme cold temperatures may lead to frozen water mains and pipes, damaged car engines, and prolonged exposure to cold resulting in frostbite.
Cause injury or death	Injury and slight risk of death. Significant threat to the elderly.
Potential Facility Shutdown	Days

Background. According to FEMA's *Multi-hazard Identification and Risk Assessment: A Cornerstone of the National Mitigation Strategy*:

"…a winter storm can range from moderate snow over a few hours to blizzard conditions with blinding wind-driven snow that last several days. Some winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by low temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is one that drops 4 or more inches of snow during a 12- hour period, or 6 or more inches during a 24-hour span. An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can impact a community or region for days, weeks, and even months. Storm effects such as extreme cold, flooding, and snow accumulation can cause hazardous conditions and hidden problems for people in the affected area."

Winter storms consisting of extreme cold and heavy snow or ice can affect all states in the continental United States. Areas where such weather is unusual are typically affected more severely than regions that routinely deal with such weather events. No region can fully

prepare for a severe winter storm so some degree of disruption is inevitable, regardless of how much experience a community of state may have. Winnebago has had four Emergency Declaration in the past, resulting from a significant amount of snow received in the area.

Table 33. Winnebago Emergency Declarations – Severe Winter

Year	Date	Disaster Type	Disaster Number	Funding Received
1979	01/16	Blizzards and Snowstorm	3068	$58.082.881.00
1999	01/08	Severe Winter Storm	3134	$40,624,371.00
2001	01/17	Severe Winter Storm	3161	$22,791,787.00
2006	12/29	Snow	3269	$483,256.18
			TOTAL	**$121,982,298.18**

Source: FEMA- Illinois States Disaster History, http://www.peripresdecusa.org/mainframe.htm

Severe Winter Storm History. The following table shows the annual snowfall averages from 1971-2000.

Table 34. Snowfall Summary 1971-2000 Averages (Rockford, Illinois Airport Station : 117382)

Element	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Snow (in)	10.3	8	5.6	1.4	0	0	0	0	0	0.1	2.6	10.8	38.8

Source: http://mrcc.sws.uiuc.edu/climate_midwest/maps/il_mapselector.htm

The following are descriptions of the severe winter storms in Winnebago County and shows the level of typical historical intensity.

a. March 6, 1964: A severe winter storm virtually paralyzed sections of northern Illinois on March 6. The vicious weather packed gale force winds and heavy snow and rain around the area which lead to all schools and many businesses being closed in Rockford. Rockford public schools were closed for the first time since 1918. No city buses were operating and city streets were closed intermittently due to jackknifed trucks which inevitably halted traffic. Power outages were common throughout the city causing more problems. Rockford was hit with a total of 9 inches of snow and extreme howling winds.

b. January 8, 1988: A band of heavy snow began falling over northwest Illinois during the morning, and by evening, 4 to 8 inches of snow had fallen over much of the northern part of Illinois. The heaviest snow fell from west of Peoria to Rockford, and as far east as some of the Chicago suburbs.

c. January 10, 1982: Bitterly cold weather was found across Illinois. Of the 109 weather reporting stations in the state, 48 of those reported lows of 20 degrees below zero or colder. Some of the coldest temperatures included 27 below zero at Rockford.

d. February 6, 1982: Bitter cold was found across northern and central Illinois. Low temperatures of 20 degrees below zero or colder were noted from near Peoria east to Watseka, and also from the Quad Cities northeast to Rockford.

e. February 22, 1994: Heavy snow fell across northern Illinois, beginning the afternoon of the 22nd and continuing into the next day. Snowfall totals included 9.3 inches at Rockford. Strong northeast winds caused considerable blowing and drifting of the snow. (Source: www.crh.noaa.gov/ilx/trivia/febtriv.php)

See Appendix G for past severe winter storm events recorded by the National Climatic Data Center for Winnebago and its jurisdictions.

Severe Winter Storm Impacts. Due to the destructive nature of snow and ice these events impact human life, health, and public safety. Community-wide impacts include: power outages, which results in loss of electrical power and potentially loss of heat, and human life. Extreme cold temperatures may lead to frozen water mains and pipes, damaged car engines, and prolonged exposure to cold resulting in frostbite. Community-wide impacts include: Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities. Can cause severe transportation problems and make travel extremely dangerous.

Probable Future Occurrences. There is no jurisdictional dollar loss information associated with this hazard and are classified on a regional basis, therefore, impact cannot be determined for a particular jurisdiction within the county. The probability of future occurrences calculation was based on number of past events over a period of years. Winnebago County had 22 of the 364 snow, ice, and extreme cold events that occurred in Illinois between January 1950 and March 2007.

With 22 occurrences over the past 57 years, the likelihood of a severe winter storm hitting somewhere in the county is 39% in any given year.

Table 35. Severe Winter Storm Probability

Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
Snow and Ice	17	0.30
Extreme Cold	5	0.09
Any Type of Severe Winter Storm	22	0.39

3.2.2.7. Tornado Profile

Table 36. Summary of Tornado Risk Factors

Period of occurrence:	Year-round, primarily during March through August
Number of Events to-date: 1950-2007 (National Climatic Data Center - NCDC)	10
Annual Chance Probability Ratio	0.18
Warning time:	Minutes to hours. Over 80 % of all tornadoes strike between noon and midnight.
Potential Impact(s):	Utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities. Impacts human life, health, and public safety.
Cause injury or death	Injury and risk of multiple deaths
Potential facilities shutdown?	30 days or more

Background. Tornadoes track through Illinois at a rate of just over 29 per year. Illinois is in the heart of "Tornado Alley", an area of the U.S. known for its violent outbreaks of severe storms. All areas of the state are at the risk of encountering a tornado. Winnebago County is located in the most severe wind zone (ZONE IV, 250 mph) in the country. This signifies that most of the state is highly vulnerable to tornadic weather. The path in which a tornado takes is not geographically limited to a certain jurisdiction in Winnebago County; therefore, all jurisdictions are equally vulnerable to this hazard. Mobile home parks, however, are more susceptible to a tornado because the potential damage is concentrated in that area.

Tornadoes are extremely common throughout Illinois and have occurred in every month of the year. Conversely, the occurrence of a tornado is highly unpredictable in it is impossible to forecast the exact time and location that it will touch down and the path that it will take.

Most tornadoes occur between March and July, with the month of May normally experiencing the greatest number of tornadoes. The strongest tornadoes, which usually result in the highest number of deaths and greatest destruction of property, occur between April and June. Most deaths occur in April, which is considered the beginning of the tornado season.

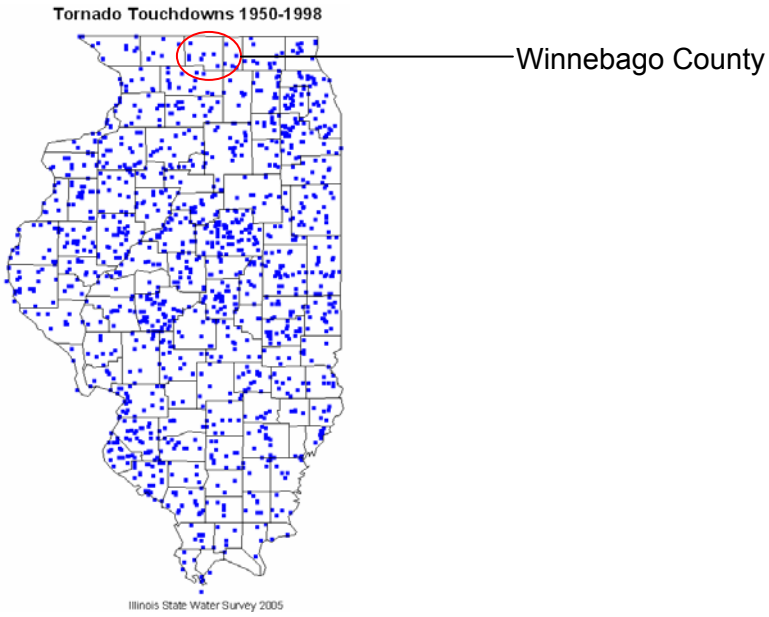


Figure 26. Illinois Tornado Touchdowns, 1950-1998

Tornado History. One tornado event has been Presidentially declared for Winnebago County, as shown in the table below.

Table 37. Winnebago County Declarations - Tornadoes

Year	Date	Disaster Type	Disaster Number	Funding Received:
1967	04/25	Tornadoes	227	$1,244,136.00

Source: http://www.peripresdecusa.org/mainframe.htm

The following are descriptions of the major tornadoes in Winnebago County and shows the level of typical historical damage.

a. April 18, 1880: A violent tornado, estimated at F4 intensity, touched down north of Rockford near Rockton, moving northeast to near Beloit, WI. Two farms were swept away in Illinois, killing one person near the state line.

b. June 21, 1939: A widely visible tornado, estimated at F2 intensity, was watched by hundreds of people in Winnebago County. The tornado reportedly "meandered" in the Pecatonica River Valley in the northwest part of the county. No deaths or injuries were reported.

c. September 14, 1928: A violent tornado, estimated at F4 intensity with winds over 200 mph, tore across Rockford. The tornado first touched down 8 miles south southwest of Rockford, and moved across the southeast part of the city. Four factories were damaged or destroyed, including the Rockford Chair and Furniture Company. Eight workers were killed there when the 3-story building collapsed. About a mile downstream, 3 boys were killed by a wind-flung roof in front of their home. The tornado was on the ground for 26 miles, dissipating in Boone County near Capron. A total of 20 people were killed, with around 150 injuries reported, 200 homes were damaged and $2 million dollars in property

damage. The rain that followed the high winds caused the streets and several basements in Rockford to flood. (Source: www.crh.noaa.gov/ilx/trivia/septriv.php and Chicago Daily Tribune)

d. July 14, 1966: A tornado tore thru Rockton, north of Rockford in Winnebago County, and left fallen trees and power lines in its wake. The tornado also hit McChesney Airport in Loves Park northeast of Rockford, flattening three hangers full of planes and blowing one plane across U.S. highway 51, blocking all four lanes of traffic. Damage at the airport was estimated at $100,000.

e. August 29, 1990: An unusual severe storm tracked its way from Janesville, Wisconsin to Winnebago County, Illinois in a southeastern path and produced a tornado in Pecatonica, which is 15 miles west of Rockford. This tornado caused downed power lines, destroyed trees, lifted cars off the ground and topples cemetery stones. The tops of these clouds were reported at 65,000 feet which is a signature sign of severe weather. No deaths of injuries were reported. (Source: The Chicago Tribune)

See Appendix G for past tornado events recorded by the National Climatic Data Center for Winnebago and its jurisdictions.

Tornado Potential Impacts. Due to the destructive nature of tornadoes and wind, these events impact human life, health, and public safety. Community-wide impacts include: utility damage and outages, infrastructure damage (transportation and communication systems), structural damage, and damaged or destroyed critical facilities. Tornadoes can also cause severe transportation problems and make travel extremely dangerous. Although tornadoes strike at random, making all buildings vulnerable, three types of structures are more likely to suffer damage:

- Mobile homes,
- Homes on crawlspaces (more susceptible to lift), and
- Buildings with large spans, such as airplane hangers, gymnasiums and factories.

Probable Future Occurrences. Winnebago County had 10 of the 2090 tornado events that occurred in Illinois between January 1950 and March 2007.

With 10 occurrences over the past 57 years, the likelihood of a tornado hitting somewhere in the county is 18% in any given year. Tornadoes, like other climatological hazards, are not bound to a particular path or location; therefore all jurisdictions within Winnebago County have the same probability of being struck by a tornadic event.

Table 38. Tornado Probability

Type	Number of Occurrences Since 1950	Annual Chance Probability Ratio
F0	5	0.09
F1	2	0.04
F2	3	0.05
F3	0	NA*
F4	0	NA*
F5	0	NA*
Tornado Frequency ≤ F2	10	0.18

*Note: Probability for tornadoes with a magnitude of F3 and higher cannot be calculated due to the lack of historical occurrences during the past 57 years. There have been tornadoes of these magnitudes in the past and could occur again in the future.

3.3. Assessing Vulnerability

This section documents the results and methodologies of the Winnebago County natural hazard vulnerability assessment.

3.3.1. Assessing Vulnerability – Overview

The methods used to assess vulnerability of natural hazards throughout Winnebago County incorporated the following:

- Number of past events and future probabilities for each hazard,
- Number and locations of at risk structures, structure types and estimated values,
- Number and locations of critical facilities at risk to each hazard,
- Number of population at risk to each hazard, and
- Planning Team feedback and public survey results.

Severity rankings were categorized using similar a convention to the Illinois' Natural Hazard Mitigation Plan. The tables below provide an overview of the vulnerability rankings and individual assessment results for each jurisdiction.

Table 39. Winnebago County Hazard Risk Ranking

Community	Population	Hazard Risk Ranking						
		Drought	Earthquake	Extreme Heat	Flood	Severe Storms	Severe Winter Storms	Tornado
Village of Cherry Valley	2,191	Guarded	Guarded	Guarded	Elevated	High	Elevated	Elevated
Village of Durand	1,081	Elevated	Guarded	Guarded	Elevated	High	Elevated	Elevated
City of Loves Park	2,044	Elevated	Guarded	Elevated	High	High	High	Elevated
Village of Machesney Park	20,759	Guarded	Guarded	Guarded	Elevated	High	Elevated	Elevated
Village of New Millford	541	Guarded	Guarded	Low	Elevated	Elevated	Elevated	Guarded
Village of Pecatonica	1,997	Elevated	Guarded	Guarded	Elevated	High	Elevated	Elevated
City of Rockford	150,115	Elevated	Guarded	Elevated	High	High	High	Elevated
Village of Rockton	5,296	Guarded	Guarded	Guarded	Elevated	High	Elevated	Elevated
Village of Roscoe	6,244	Elevated	Guarded	Guarded	High	High	High	Elevated
City of South Beloit	5,397	Elevated	Guarded	Guarded	High	High	Elevated	Elevated
Village of Winnebago	2,958	Guarded	Guarded	Low	Low	Elevated	Elevated	Guarded
Winnebago County Unincorporated	79,795	Elevated	Guarded	Elevated	High	Severe	High	Elevated

Methodology and individual results were derived by geographically weighting risk as a function of event probability and event consequences.

3.3.2 Multi-Jurisdictional Risk Assessment Methodology

The Planning Team worked together to develop a risk assessment model that analyzed event probability, infrastructure at-risk, and population exposure.

Hazard rankings were based upon numerical ranking concepts similar to the State's Hazard Mitigation criteria, however modified to accommodate local interests and more detailed information.

Overall rankings were generated by totaling individual scores assessed for each community's risk to a given hazard. Specifically, hazard risk was estimated as a function of the following variables:

a. Number of past hazard events,

0 to 10 events in last 57 years = 1
11 to 50 events in last 57 years = 2
51 or more events in last 57 years = 3

b. Estimated structure vulnerability,

$0 to $50,000 of estimated damages = 1
$50,000 to $500,000 of estimated damages = 2
$500,000 or more of estimated damages = 3

c. Number of critical facilities at risk,

0 to 10 critical facilities exposed = 1
11 to 50 critical facilities exposed = 2
51 or more critical facilities exposed = 3

d. Population exposure.

0% to 10% of community population exposed = 1
10% to 25% of community population exposed = 2
25% or more of community population exposed = 3

Individual variable scores were then totaled for each community's vulnerability and categorized according to the table key below and as shown above in Table 39.

4 = Low
5 to 6 = Guarded
7 to 8 = Elevated
9 to 10 = High
11 to 12 = Severe

The following subsections detail individual results generated for each risk assessment variable.

3.3.2.1 Incorporating Historical Occurrences

Much like the Illinois Natural Hazard Mitigation Plan, the Winnebago County risk assessment model also accounted for past occurrences of natural hazards. The following scores were given to each community based upon frequency of events recorded for their jurisdiction.

0 to 10 events in last 57 years = 1
11 to 50 events in last 57 years = 2
51 or more events in last 57 years = 3

The number of historical occurances of each event were based upon research performed at the local, state and federal levels. Ultimately, the Planning Team agreed to primarily use quantities and results recorded by NOAA's National Climatic Data Center (NCDC).

Table 40. Natural Hazard Historical Occurrences by Hazard and Jurisdiction

Jurisdiction	Drought	Earthquake	Extreme Heat	Flood	Severe Storm	Severe Winter Storm	Tornado
Village of Cherry Valley	12	2	3	21	195	22	10
Village of Durand							
City of Loves Park							
Village of Machesney Park							
Village of New Millford							
Village of Pecatonica							
City of Rockford							
Village of Rockton							
Village of Roscoe							
City of South Beloit							
Village of Winnebago							
Winnebago County Unincorporated							

Note: Historical event research produced countywide results that were not specific to individual jurisdictions.

3.3.2.2 Incorporating Infrastructure Vulnerability

Structural risk is a function of the consequences of an event in relationship to the probability of the event occurring. Combined, both consequences and probability operate together to convey risk (R=PxC)

For purposes of the Plan, the probability of a future event occurring in any given year is calculated based upon the number of past events divided by the number of years of record. For example, there have been 22 severe winter storms throughtout the county over the last 57 years, yielding an annual occurrence ratio of 0.39 (probability). The results of the hazard profiling effort tell us that those 22 events have produced a combined $2,260,000 of documented damages, or roughly $102,000 per event (consequences).

Knowing both the annual occurrence probability ratio and the average damage consequences per occurrence allows us to predict a weighted financial loss to infrastructure for any given year by multiplying the two values together. Therefore we can then say that for any given year, it is likely that somewhere in the county, approximately $40,000 worth of damages will be sustained. However, considering we do not know where this damage will occur, we can then proportionally distribute that damage across the individual jurisdictions. This is accomplished by comparing the relative area that each jurisdiction occupies with

respect to the entire county. For example, the City of Rockford occupies approximately 12% of the county's geographic area. Therefore, the Risk Assessment Model would predict the City of Rockford as assuming approximately $4800 of estimated annual risk for this hazard.

Distributing the risk in this manner is preferred given that the events are geographic in nature and do not necessarily correlate to population distribution.

The same is true for all hazards except for flooding. Flood risk is unique in that its estimated annual frequencies and boundaries come provided as part of FEMA's standard Digital Flood Insurance Rate Map (DFIRM) product. For the Plan, flood risk is estimated as a function of 100-year flood boundaries compared to each intersecting parcel's structure value.

Structure Vulnerability (Risk) expressed as a formula:

$$\textbf{\textit{Risk = P x C x D (used for all hazards except flood)}}$$

$$\textbf{\textit{Risk = }}P_f \textbf{\textit{ x }} C_f \textbf{\textit{ (used for flood risk)}}$$

Where:

P *= Annual Chance Probability Ratio (past events / years of record)*
Pf *= Flood Probability Based on FEMA 0.01 Annual Chance.*

C *= Average Annual Damages ($) from NCDC Records.*
Cf *= Flood Consequences Based on Complete Loss of Assessed Market*

D *= Geographic Weighted Distribution of Event by Jurisdictional Area*
Note: Geographic Distribution of flood plains is predeterminded based upon FEMA's mapped flood areas and not subjected to an additional area distribution factor.

The following scores are given to each community based upon estimated annual weighted damages of infrastructure vulnerability for each jurisdiction.

$0 to $50,000 of estimated damages = 1
$50,000 to $500,000 of estimated damages = 2
$500,000 or more of estimated damages = 3

Table 41. Structural Vulnerability by Hazard and Jurisdiction

Jurisdiction	Drought	Earthquake	Extreme Heat	Flood	Severe Storm	Severe Winter Storm	Tornado
Village of Cherry Valley	$0	$0	$0	$26,281,677	$974.	$411	$59
Village of Durand	$0	$0	$0	$5,837,556	$117	$50	$7
City of Loves Park	$0	$0	$0	$109,002,609	$4,226	$1,785	$257
Village of Machesney Park	$0	$0	$0	$195,621,864	$1,972	$833	$120
Village of New Millford	$0	$0	$0	$2,321,589	$193	$82	$12
Village of Pecatonica	$0	$0	$0	$4,745,532	$198	$83	$12
City of Rockford	$0	$0	$0	$344,741,157	$11,081	$4,681	$673
Village of Rockton	$0	$0	$0	$17,217,390	$850	$359	$52
Village of Roscoe	$0	$0	$0	$55,717,533	$1,602	$677	$97
City of South Beloit	$0	$0	$0	$51,625,827	$846	$357	$51
Village of Winnebago	$0	$0	$0	$0	$216	$91	$13
Winnebago County Unincorporated	$0	$0	$0	$441,092,064	$71,585	$30,240	$4,349

Note: Values of $0 do not necessarily imply zero risk. Source data from the National Climatic Data Center often lacked reported damages for hazard events.

3.3.2.3 Incorporating Critical Facilities

Critical facilities provide communities throughout Winnebago County vital services and resources. Should critical facilities fail during a natural hazard, short and long term impacts can be devastating to a community's safety and economy.

For each hazard profiled, the following scores are applied toward each community based upon the number of critical facilities exposed within their jurisdiction.

0 to 10 critical facilities exposed = 1
11 to 50 critical facilities exposed = 2
51 or more critical facilities exposed = 3

The number of critical facilities exposed to each hazard were based upon research performed at the local, state and federal levels. Ultimately, the Planning Team agreed to supplement FEMA's HAZUS critical facilities with additional locally identified critical infrastructure.

Table 42. Critical Infrastructure Exposure by Hazard and Jurisdiction

Jurisdiction	Drought	Earthquake	Extreme Heat	Flood	Severe Storm	Severe Winter Storm	Tornado
Village of Cherry Valley	33	33	33	3	33	33	33
Village of Durand	28	28	28	4	28	28	28
City of Loves Park	74	74	74	31	74	74	74
Village of Machesney Park	42	42	42	6	42	42	42
Village of New Millford	3	3	3	1	3	3	3
Village of Pecatonica	27	27	27	3	27	27	27
City of Rockford	551	551	551	96	551	551	551
Village of Rockton	24	24	24	5	24	24	24
Village of Roscoe	62	62	62	25	62	62	62
City of South Beloit	41	41	41	13	41	41	41
Village of Winnebago	9	9	9	0	9	9	9
Winnebago County Unincorporated	395	395	395	151	395	395	395

3.3.2.4 Incorporating Population

The Planning Team's mission is to protect life from the adverse impacts of natural hazards. Understanding where population densities are located and the demographics at risk to specific hazards is critical to mitigating risk. For example, individuals over the age of 65 over are significantly more susceptible to extreme heat.

For each hazard profiled, the following scores are given to each community based upon the percentage of each community's population exposed within their jurisdiction.

0% to 10% of community population exposed = 1
10% to 25% of community population exposed = 2
25% or more of community population exposed = 3

The population exposed to each hazard was based upon the 2000 U.S. Census data. Most hazards, aside from flooding, are subject to strike anywhere within the county, thus rendering the entire county population at risk. Extreme Heat, however is unique in that citizens 65 or older tend to be more vulnerable to this hazard. As a result, Census data was further profiled to estimate associated population percentages at risk to this hazard. Flood populations were estimated based upon U.S. Census values for average population per residential household per community. These averages were then applied to the number of residential parcels intersecting each flood hazard within each jurisdiction.

Table 43. Population Exposure by Hazard and Jurisdiction

Jurisdiction	Drought	Earthquake	Extreme Heat	Flood	Severe Storm	Severe Winter Storm	Tornado
Village of Cherry Valley	100%	100%	8.0%	11.4%	100%	100%	100%
Village of Durand	100%	100%	13.6%	7.0%	100%	100%	100%
City of Loves Park	100%	100%	11.3%	58.4%	100%	100%	100%
Village of Machesney Park	100%	100%	9.3%	16.0%	100%	100%	100%
Village of New Millford	100%	100%	9.1%	5.9%	100%	100%	100%
Village of Pecatonica	100%	100%	14.9%	3.1%	100%	100%	100%
City of Rockford	100%	100%	14.1%	2.2%	100%	100%	100%
Village of Rockton	100%	100%	9.8%	3.5%	100%	100%	100%
Village of Roscoe	100%	100%	6.7%	12.7%	100%	100%	100%
City of South Beloit	100%	100%	12.9%	16.6%	100%	100%	100%
Village of Winnebago	100%	100%	8.3%	0%	100%	100%	100%
Winnebago County Unincorporated	100%	100%	12.7%	8.4%	100%	100%	100%

Combined, all four variables were then totaled to generate cumulative risk ranking based upon probability, consequences, and Planning Team feedback.

3.3.3 Special Considerations for Earthquakes

Using the above Risk Assessment Model produced an Elevated ranking for earthquakes. However, based upon HAZUS results and the collective opinion of the Planning Team, the ranking was adjusted to Guarded to better reflect a reduced local risk. This adjustment was approved by the State Hazard Mitigation officer and is consistent with the State's Hazard Mitigation Plan.

3.3.4 Assessing Vulnerability – Identifying Structures and Estimating Losses

For purposes of the vulnerability assessment, 'structures' were determined to include countywide structures and critical facilities.

At-Risk Structures. These structures are defined as residential, commercial, industrial or agricultural structures residing within the County. The Winnebago County Geographic Information System (WinGIS) provided 2007 countywide parcel mapping to support the estimation of structure numbers, types and locations throughout the county.

Structure Value. Structure values were estimated for each property using the Property Value Administration (PVA) data provided by the County. Once linked to the WinGIS parcel mapping information, each property's improved and fair market value could be accounted for.

Critical Facilities. Critical facilities were developed by augmenting the FEMA standard HAZUS facilities with locally provided data. HAZUS separates critical facilities into five categories based upon loss potential. Each jurisdiction was offered the opportunity to provide WinGIS addresses of additional critical facilities to be geocoded and incorporated into the master Critical Facilities mapping layer. For purposes of this Plan, the following types of facilities were considered critical and incorporated into the assessment:

- *Transportation Facilities* include airways- airports, heliports; highways- bridges, tunnels, roadbeds, overpasses, etc; railways- track segments, bridges, tunnels, rail yards, depots; waterways- canals, locks, ferries, harbors, seaports, docks, and piers.
- *Lifeline Utility Systems* such as potable water, wastewater, oil, natural gas, electric power systems, communication systems.
- *Essential Facilities* are defined as being essential to the health and welfare of the entire population and are especially important following hazard events. Consider not only their structural integrity and content value, but also the effects on the community when their services are interrupted or halted. The vulnerability is based on the service they provide rather than simply their physical aspects. Essential facilities include hospitals, other medical facilities, police and fire stations, emergency operations systems, evacuation shelters, schools, and health and human services to Winnebago County.
- *High Potential Loss Facilities* are defined as being a facility that would have a high loss associated with them, both physically and economically. Examples of such facilities are: nuclear power plants, dams, and military installations.
- *Hazardous Materials Facilities* includes facilities housing industrial/hazardous materials, such as corrosives, explosives, flammable materials, radioactive materials, toxins, etc.
- *Facilities of Local Importance* are additional facilities incorporated upon request of specific jurisdictions and include churches, government buildings, libraries, museums, correctional facilities, private water wells and other key business or industrial infrastructure.

Severe storms, severe winter storms, drought, extreme heat, earthquakes and tornados can occur anywhere within Winnebago County. As a result, all structures and critical facilities throughout the County are at risk to these natural hazards. Flood risk, however, is unique in that this risk is focused to areas near or adjacent to streams. The Planning Team agreed that flood vulnerability is best estimated in areas mapped as FEMA recognized floodplains. Therefore, structures and critical facilities intersecting these flood boundaries assume a higher risk.

The two tables presented below identify the number, type and value of structures at risk to both countywide and flood related natural hazards.

Table 44. Structure Vulnerability by Type - Countywide

Community	STRUCTURES VULNERABLE TO ALL HAZARDS EXCLUDING FLOOD BY TYPE AND VALUE								
	Residential	Residential Value ($)	Commercial	Commercial Value ($)	Industrial	Industrial Value ($)	Agriculture	Agriculture Value ($)	VALUE TOTAL ($)
Village of Cherry Valley	972	141,050,760	143	130,483,821	6	1,718,316	23	698,313	273,951,210
Village of Durand	516	47,052,207	75	11,910,357	16	800,274	6	205,686	59,968,524
City of Loves Park	7,908	836,535,477	709	248,235,300	360	109,563,138	30	418,779	1,194,752,694
Village of Machesney Park	8,908	902,080,896	226	115,219,083	212	70,753,386	30	750,198	1,088,803,563
Village of New Millford	483	19,059,903	14	2,552,916	1	73,671	7	0	21,686,490
Village of Pecatonica	866	83,633,883	82	9,624,357	37	5,721,564	11	$9,678	98,989,482
City of Rockford	48,729	4,514,029,449	3,742	1,423,605,519	1,685	545,643,666	97	63,592	6,483,342,226
Village of Rockton	2,399	337,545,249	119	27,207,501	16	5,787,564	3	264,564	370,804,878
Village of Roscoe	3,381	404,617,776	175	80,914,113	79	18,280,746	58	906,657	504,719,292
City of South Beloit	2,808	213,349,986	260	49,410,672	146	42,830,274	22	217,614	305,808,546
Village of Winnebago	1,037	120,753,261	63	7,627,575	6	2,214,666	13	362,361	130,957,863
Winnebago County Uninc	28,072	3,439,940,415	617	182,834,949	299	100,824,627	4,521	181,874,478	3,905,474,469
Winnebago County TOTALS:	**106,079**	**11,059,649,262**	**6,225**	**2,289,626,163**	**2,863**	**904,211,892**	**4,821**	**185,771,920**	**14,439,259,237**

Structural Vulnerability was estimated as a function of numbers, types and fair market value of land improvements. Parcel and property data was provided by WinGIS.

Table 45. Structure Vulnerability by Type – FEMA Mapped Floodplains Only

Community	STRUCTURES VULNERABLE TO FLOOD BY TYPE AND VALUE								
	Residential	Residential Value ($)	Commercial	Commercial Value ($)	Industrial	Industrial Value ($)	Agriculture	Agriculture Value ($)	VALUE TOTAL ($)
Village of Cherry Valley	98	11,663,739	14	13,919,625	0	0	7	698,313	26,281,677
Village of Durand	31	4,063,707	4	1,678,191	0	0	3	95,658	5,837,556
City of Loves Park	489	48,833,670	92	34,406,595	50	25,666,719	3	95,625	109,002,609
Village of Machesney Park	1,239	151,956,819	40	40,698,636	15	2,591,901	12	374,508	195,621,864
Village of New Millford	14	1,317,444	2	1,004,145	0	0	0	0	2,321,589
Village of Pecatonica	27	2,145,438	9	2,373,588	4	226,506	2	0	4,745,532
City of Rockford	1,369	156,350,088	246	123,448,788	155	64,672,281	34	0	344,471,157
Village of Rockton	68	12,017,043	18	3,547,173	2	1,388,610	2	264,564	17,217,390
Village of Roscoe	281	45,446,514	22	7,738,455	18	1,879,953	35	652,611	55,717,533
City of South Beloit	364	16,219,869	143	16,256,832	94	19,120,242	2	28,884	51,625,827
Village of Winnebago	0	0	0	0	0	0	0	0	0
Winnebago County Uninc	2,660	349,296,618	104	21,976,467	64	19,522,755	1,407	50,296,224	441,092,064
Winnebago County TOTALS:	**6,640**	**799,310,949**	**694**	**267,048,495**	**402**	**135,068,967**	**1,507**	**52,506,387**	**1,253,934,798**

Structural Vulnerability was estimated as a function of numbers, types and fair market value of land improvements. Parcel and property data was provided by WinGIS. Structure numbers and values shown above were derived from comparing property information to mapped floodplain boundaries.

Tables 46 and 47 provide numbers and types of critical facilities present within each jurisdiction. This information, while provided to FEMA for review and plan approval, is to be omitted from the final plan. The Planning Team elected to protect this information due to homeland security concerns. For additional information, please contact the Winnebago County Highway Department.

Table 46. Critical Facility Vulnerability - Countywide

Community	Critical Facilities					Transportation		Utilities						TOTAL:
	Medical Centers	Schools	Police Stations	Church	Fire Stations	Airport	Bridges	Dams	Electric Facility	Oil Facility	Wastewater Facility	Communication Center	WinGIS Critical Facility	
Village of Cherry Valley	0	1	1	2	1	0	14	1	0	0	0	0	16	36
Village of Durand	0	3	0	2	2	1	2	0	0	0	1	0	6	17
City of Loves Park	0	9	1	14	2	0	32	3	0	0	0	1	38	100
Village of Machesney Park	0	8	0	13	1	0	14	0	0	0	0	0	15	51
Village of New Millford	0	0	0	1	0	0	2	0	0	0	0	0	2	5
Village of Pecatonica	0	0	1	6	1	2	3	0	0	0	2	0	8	23
City of Rockford	5	74	3	252	3	6	144	6	2	2	3	10	176	686
Village of Rockton	0	4	1	7	1	2	6	1	0	0	1	1	12	36
Village of Roscoe	0	1	1	10	1	1	21	1	0	0	0	0	24	60
City of South Beloit	0	5	1	7	2	1	7	0	0	0	1	1	12	37
Village of Winnebago	0	4	1	3	0	0	0	0	0	0	1	0	1	10
Winnebago County Uninc.	0	15	1	77	3	12	245	4	0	0	2	10	276	645
Winnebago County TOTALS:	5	124	11	394	17	25	490	16	2	2	11	23	586	**1706**

Table 47. Critical Facility Vulnerability – FEMA Mapped Floodplains Only

Community	Critical Facilities					Transportation		Utilities						TOTAL:
	Medical Centers	Schools	Police Stations	Church	Fire Stations	Airport	Bridges	Dams	Electric Facility	Oil Facility	Wastewater Facility	Communication Center	WinGIS Critical Facility	
Village of Cherry Valley	0	0	0	0	0	0	1	1	0	0	0	0	1	3
Village of Durand	0	0	0	0	0	0	2	0	0	0	0	0	2	4
City of Loves Park	0	0	1	0	1	0	25	2	0	0	0	0	2	31
Village of Machesney Park	0	1	0	0	0	0	5	0	0	0	0	0	0	6
Village of New Millford	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Village of Pecatonica	0	0	0	0	0	0	3	0	0	0	0	0	0	3
City of Rockford	0	1	0	1	0	0	88	3	0	0	1	0	2	96
Village of Rockton	0	0	0	0	0	0	3	1	0	0	1	0	0	5
Village of Roscoe	0	0	0	0	0	0	18	4	0	0	0	0	3	25
City of South Beloit	0	1	1	0	2	0	5	0	0	0	0	1	3	13
Village of Winnebago	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Winnebago County Uninc.	0	0	0	0	0	1	147	3	0	0	0	0	1	152
Winnebago County TOTALS:	0	3	2	1	3	1	298	14	0	0	1	1	14	**339**

Tornados, earthquakes, severe storms, severe winter storms, extreme heat, and drought could potentially affect any or every location within each jurisdiction depending on the path or area the event encompasses. These hazards and their occurrences are not limited to a particular geographic area based on historical events and documentation provided in the hazard profile section for each hazard. These hazards can affect any jurisdiction at any time making every asset vulnerable. Flooding, however, is unique in that probability can be isolated to areas primarily in or adjacent to FEMA mapped floodplains.

Each jurisdiction possessing a FEMA recognized flood hazard are mapped on the following pages.

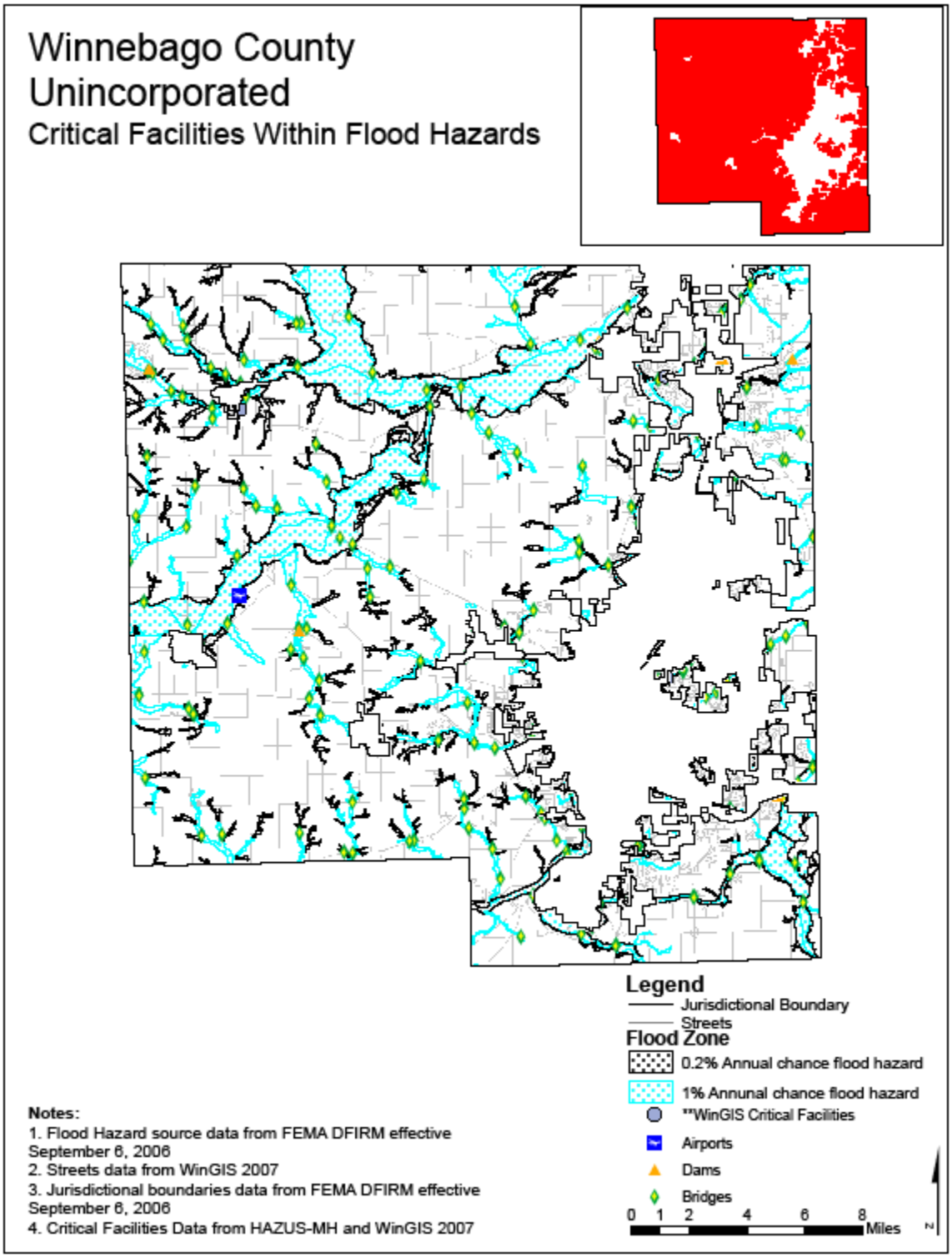


Figure 27. Winnebago County unincorporated Critical Facilities within Flood Hazards

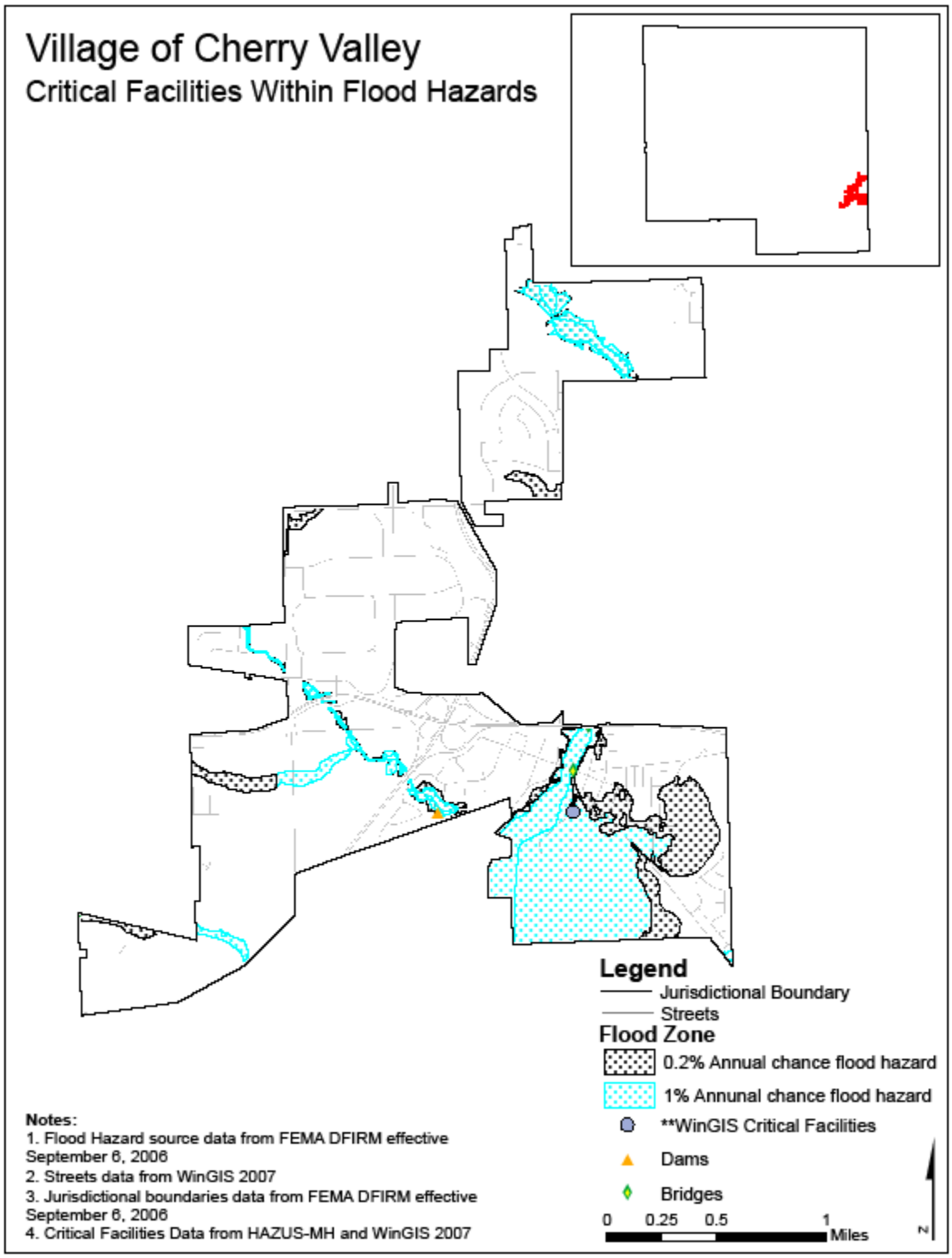


Figure 28. Village of Cherry Valley Critical Facilities within Flood Hazards

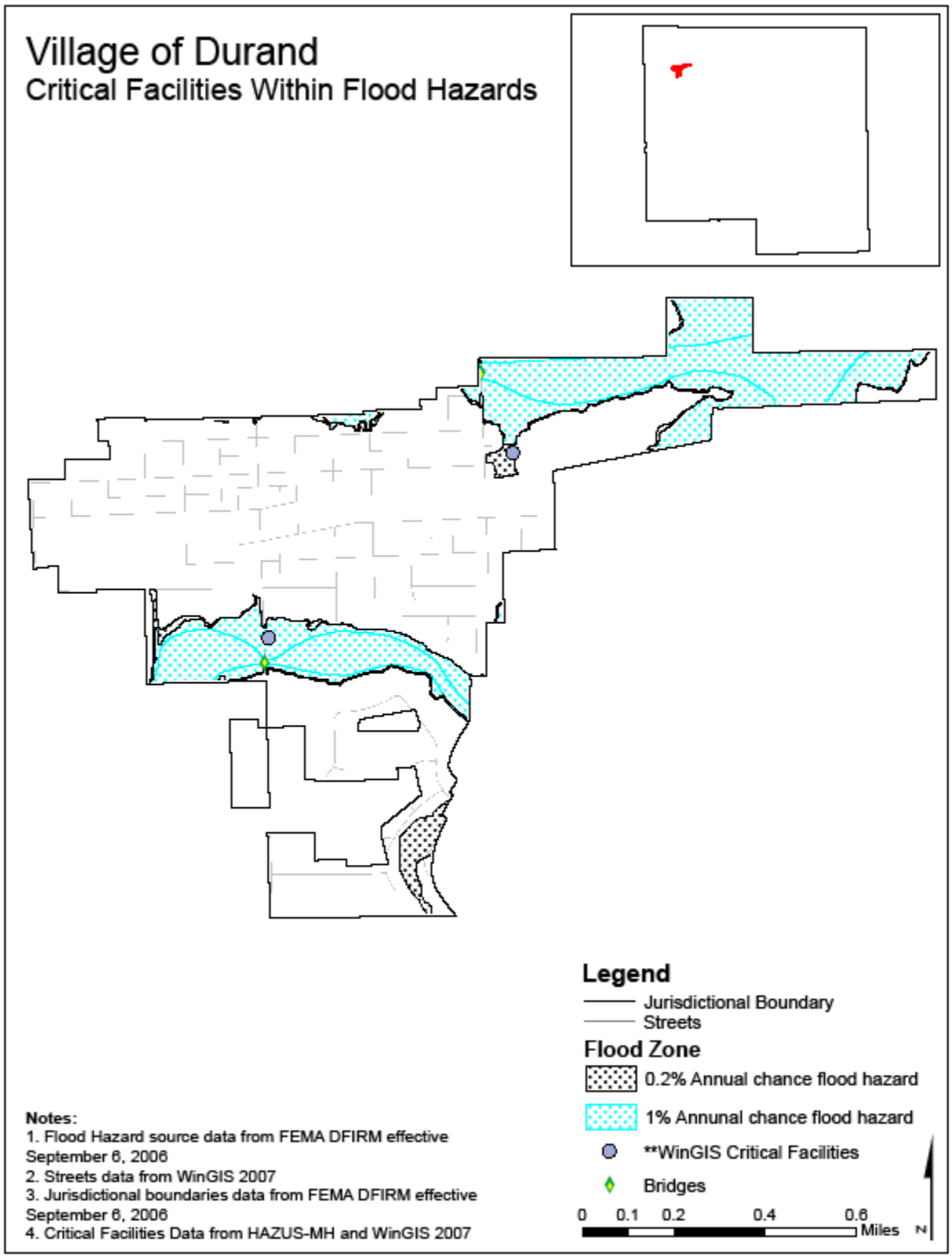


Figure 29. Village of Durand Critical Facilities within Flood Hazards

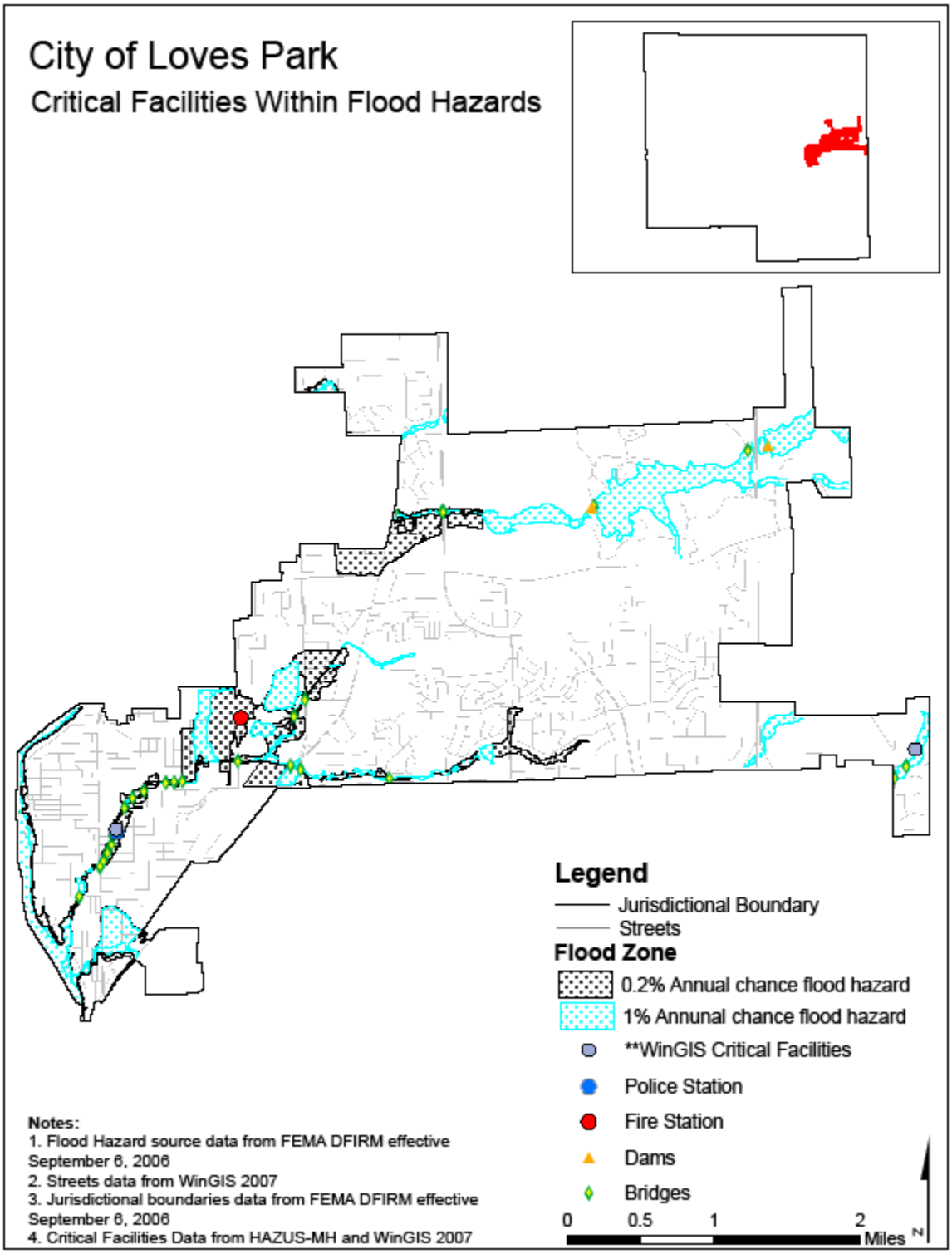


Figure 30. City of Loves Park Critical Facilities within Flood Hazards

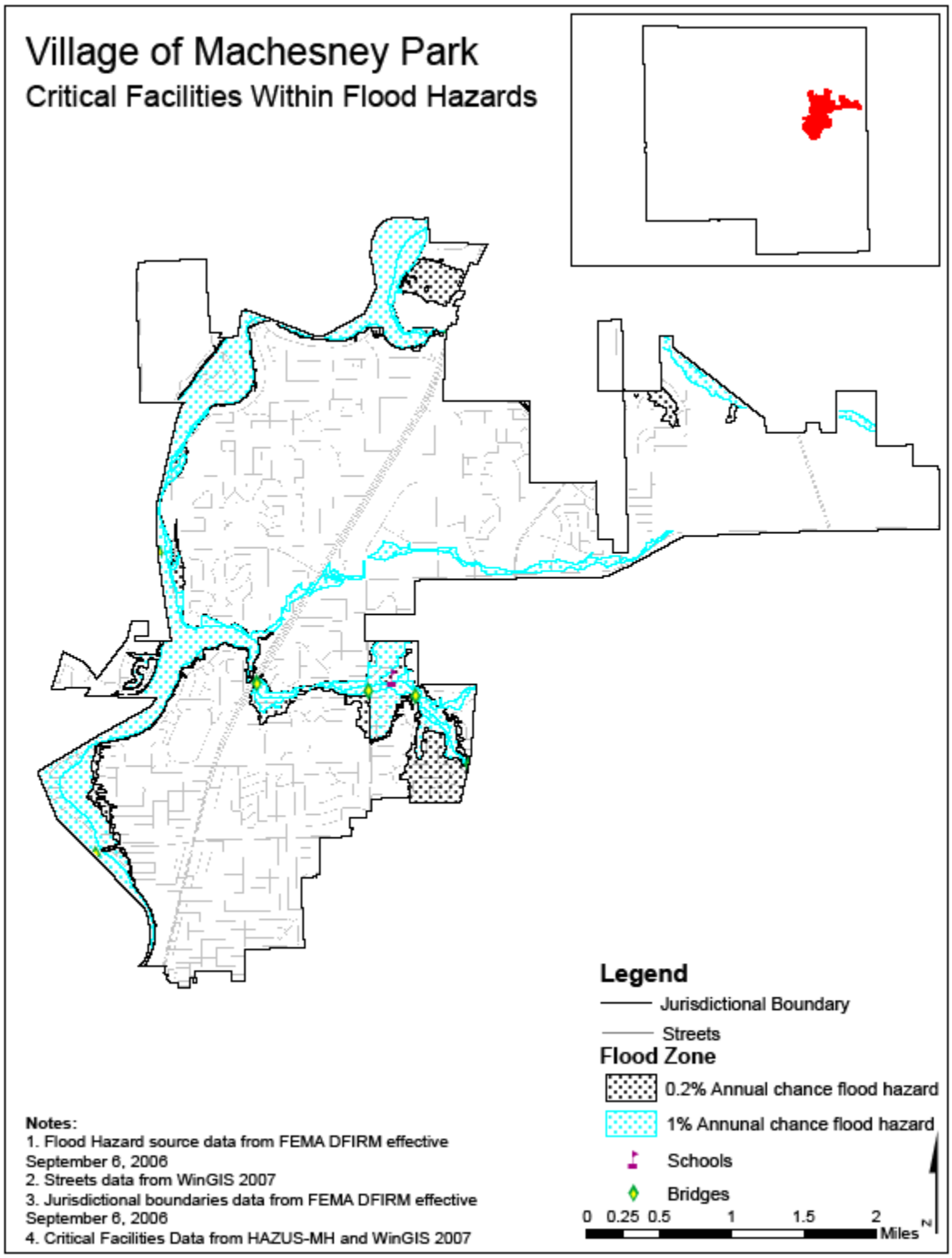


Figure 31. Village of Machesney Park Critical Facilities within Flood Hazards

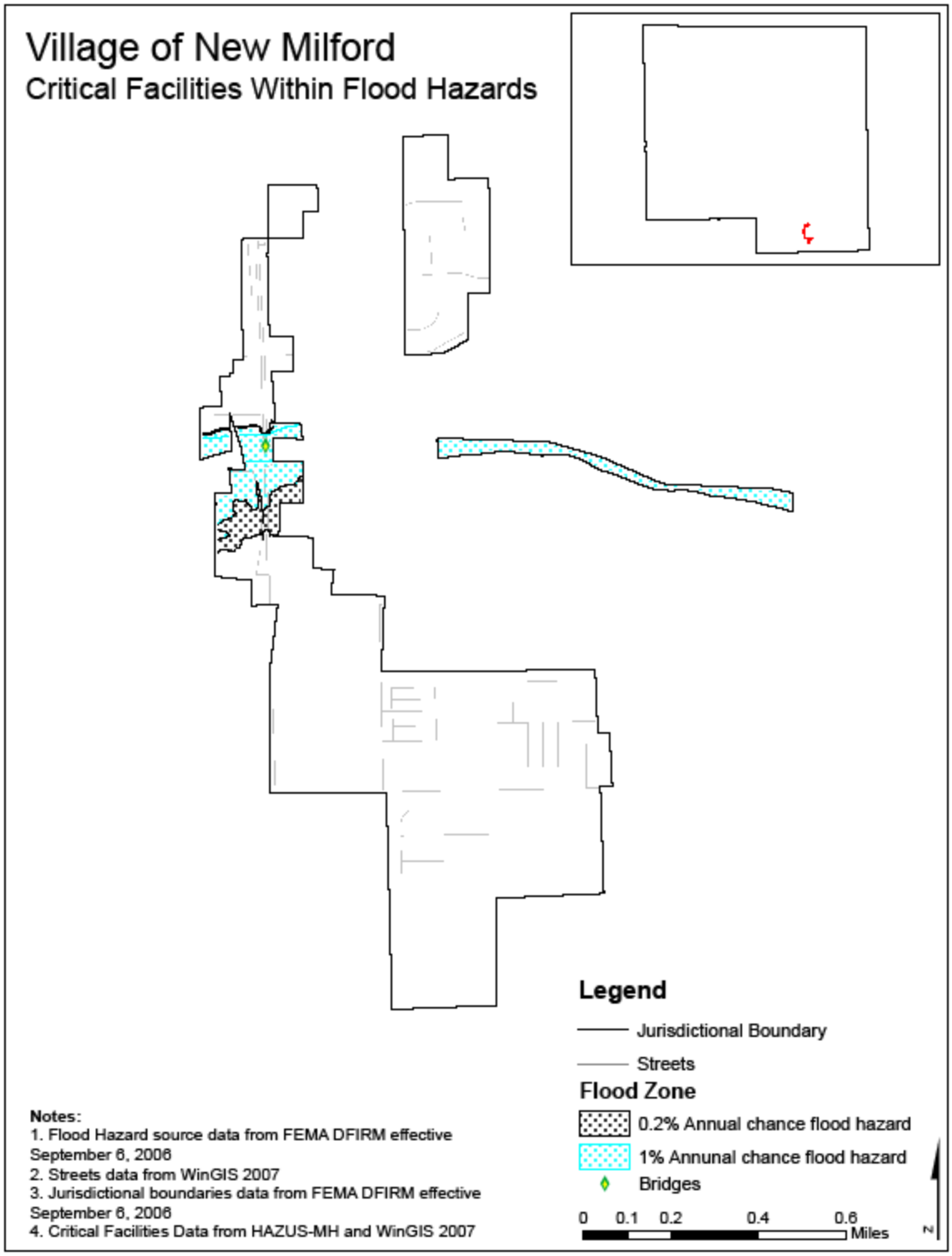


Figure 32. Village of New Millford Critical Facilities within Flood Hazards

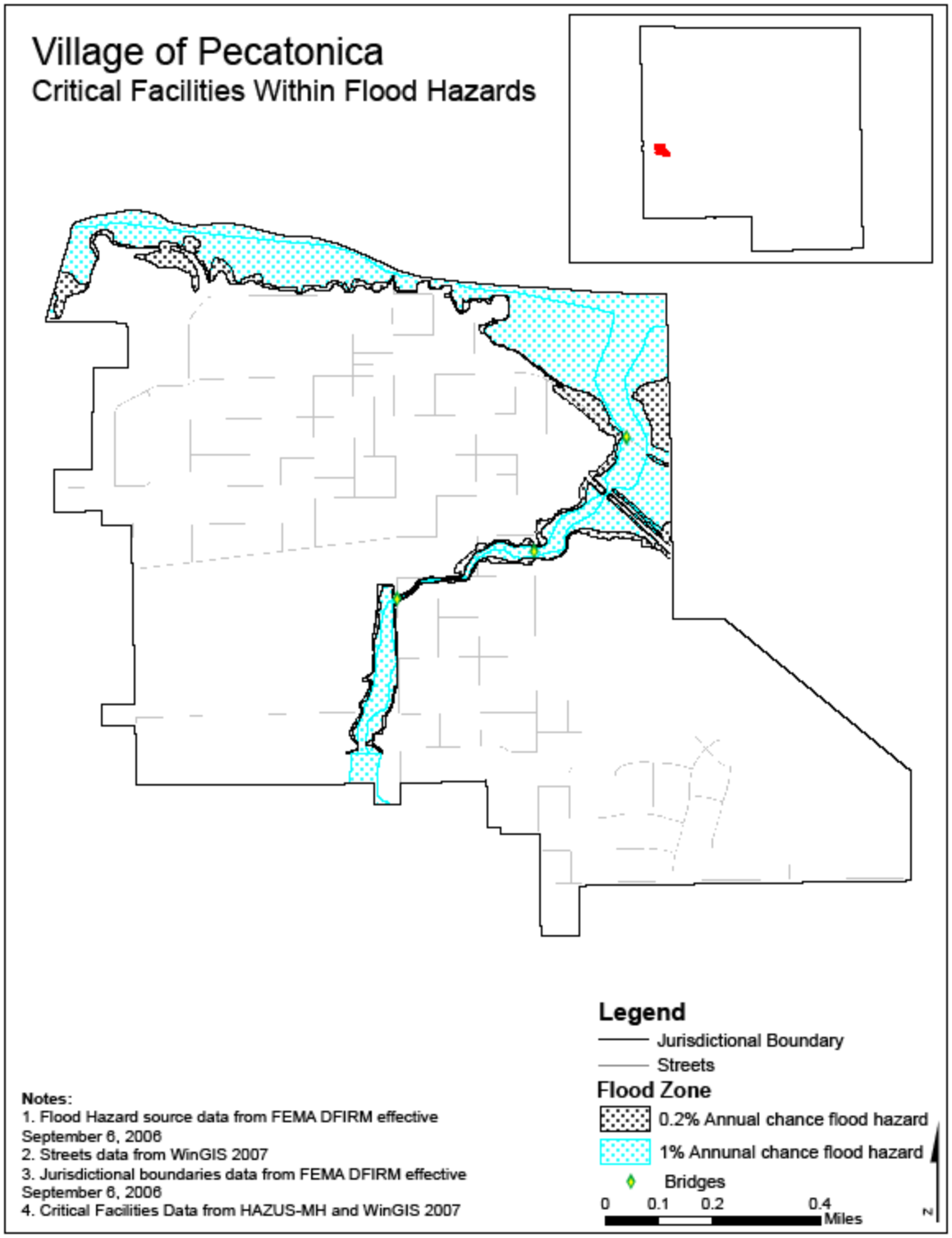


Figure 33. Village of Pecatonica Critical Facilities within Flood Hazards

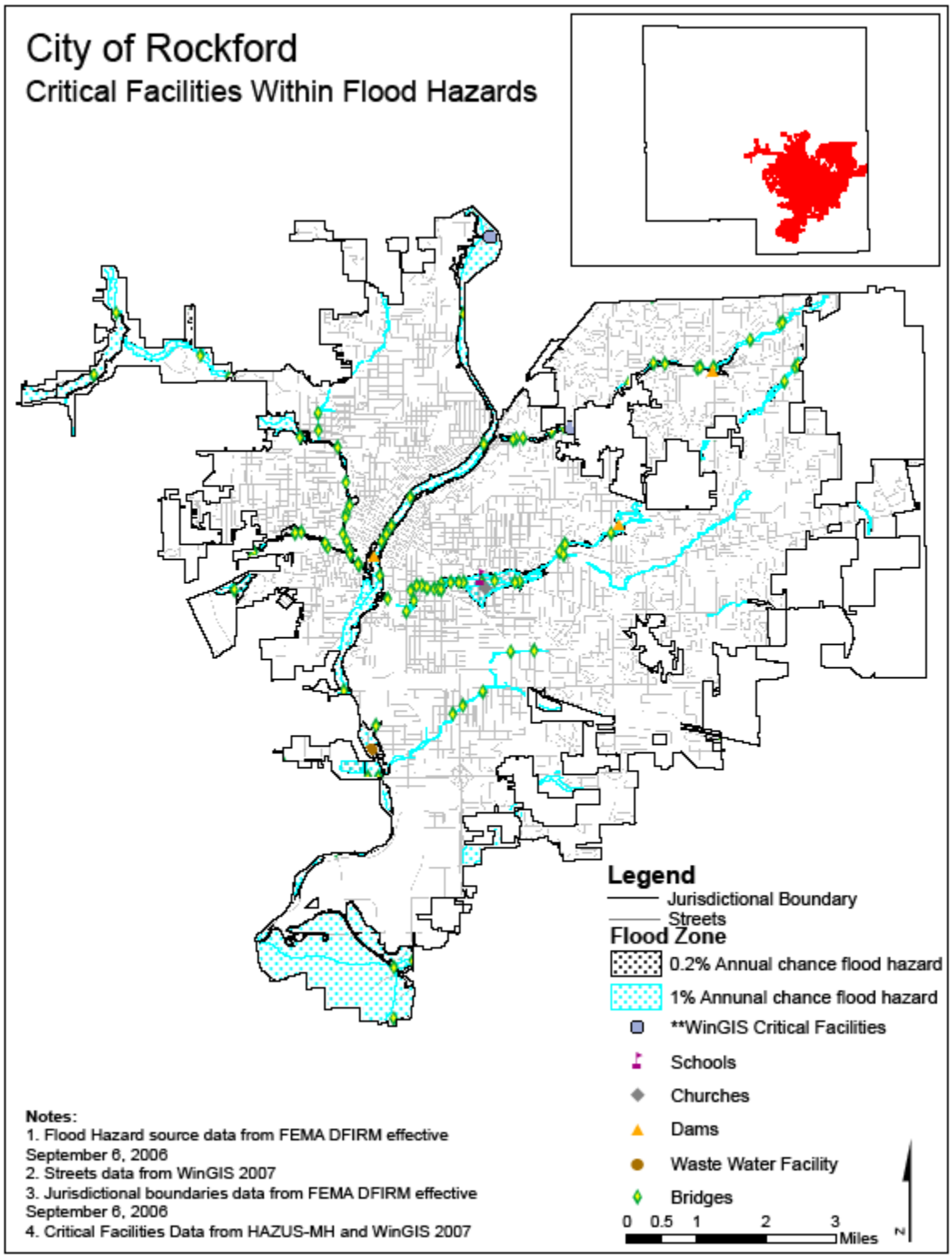


Figure 34. City of Rockford Critical Facilities within Flood Hazards

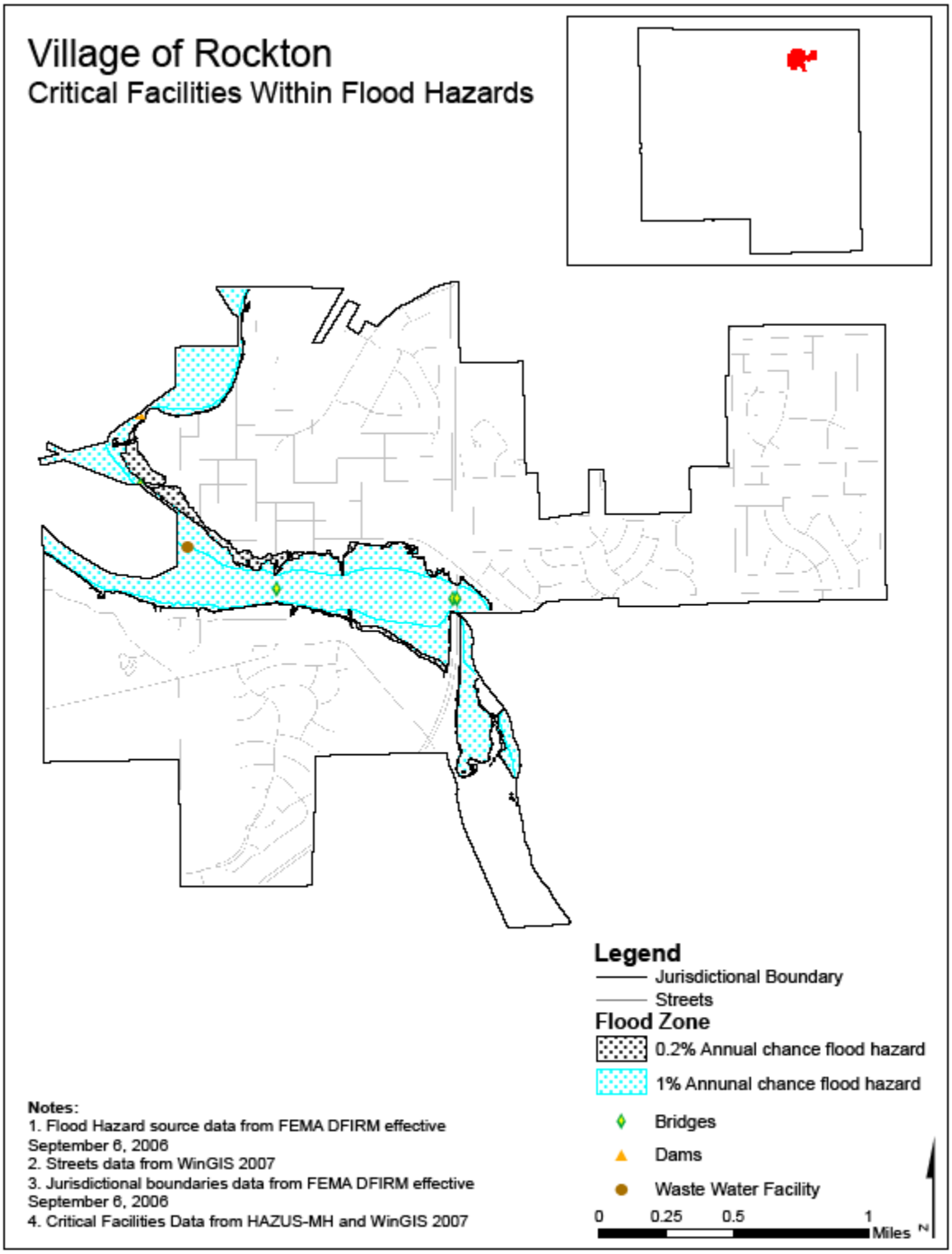


Figure 35. Village of Rockton Critical Facilities within Flood Hazards

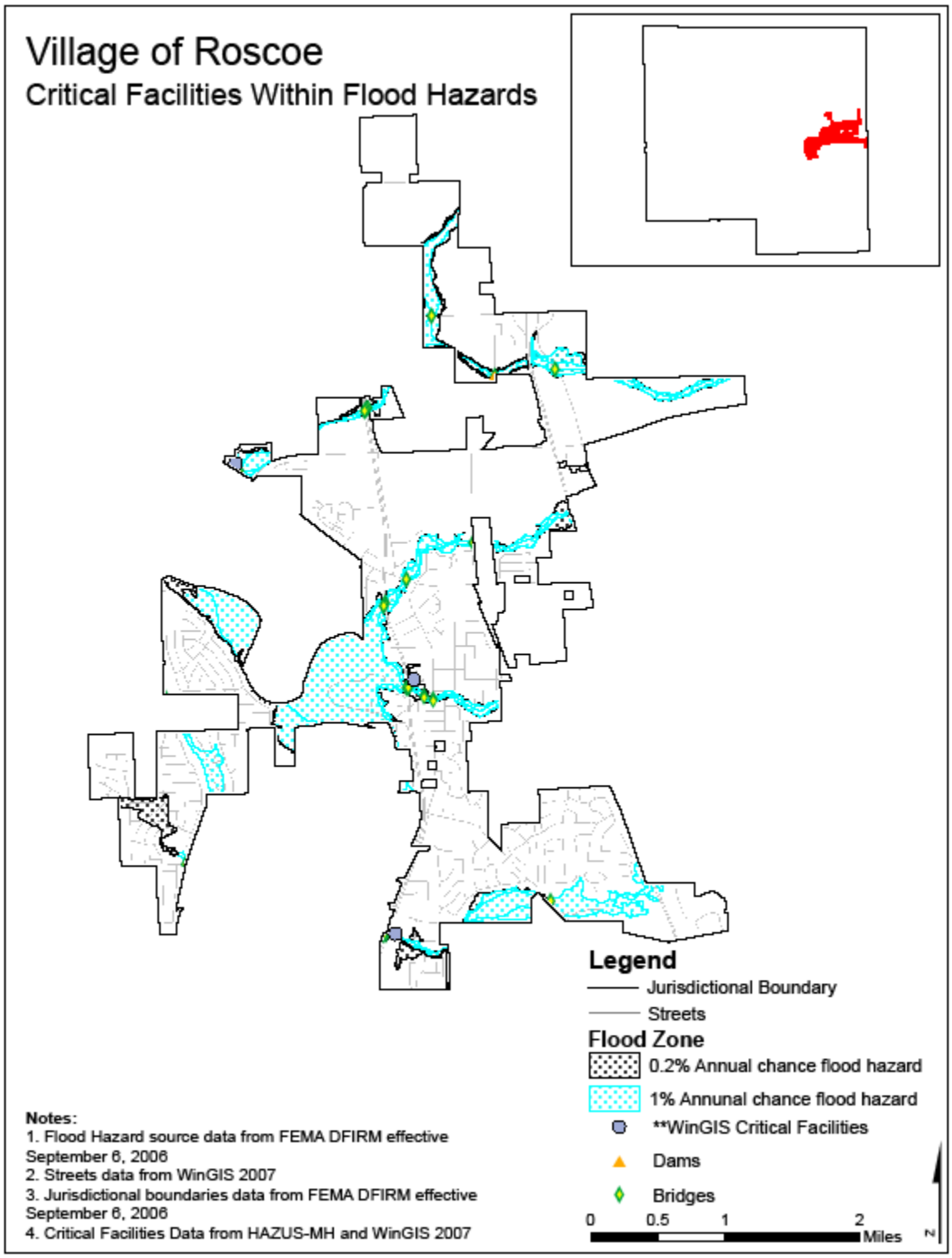


Figure 36. Village of Roscoe Critical Facilities within Flood Hazards

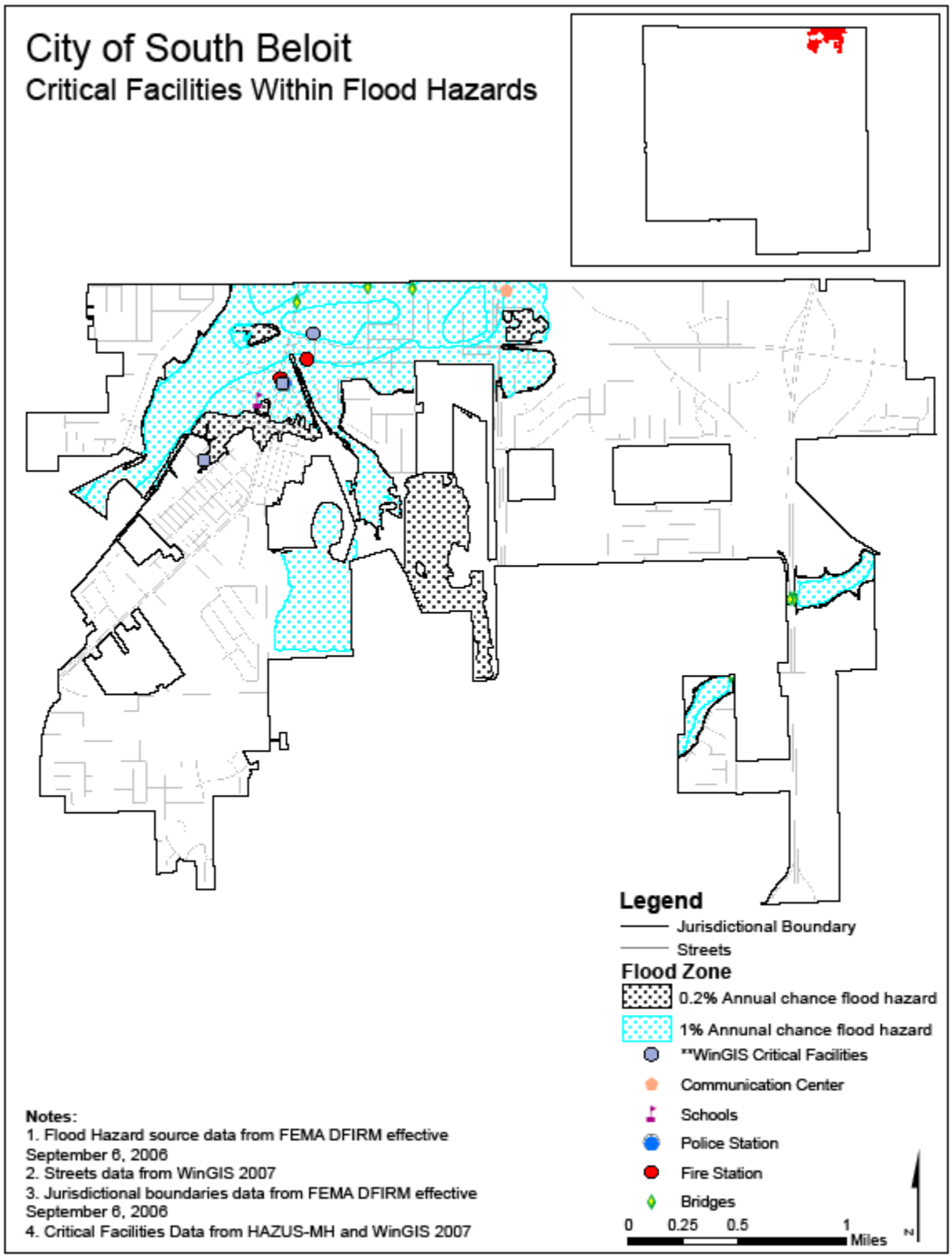


Figure 37. Village of South Beloit Critical Facilities within Flood Hazards

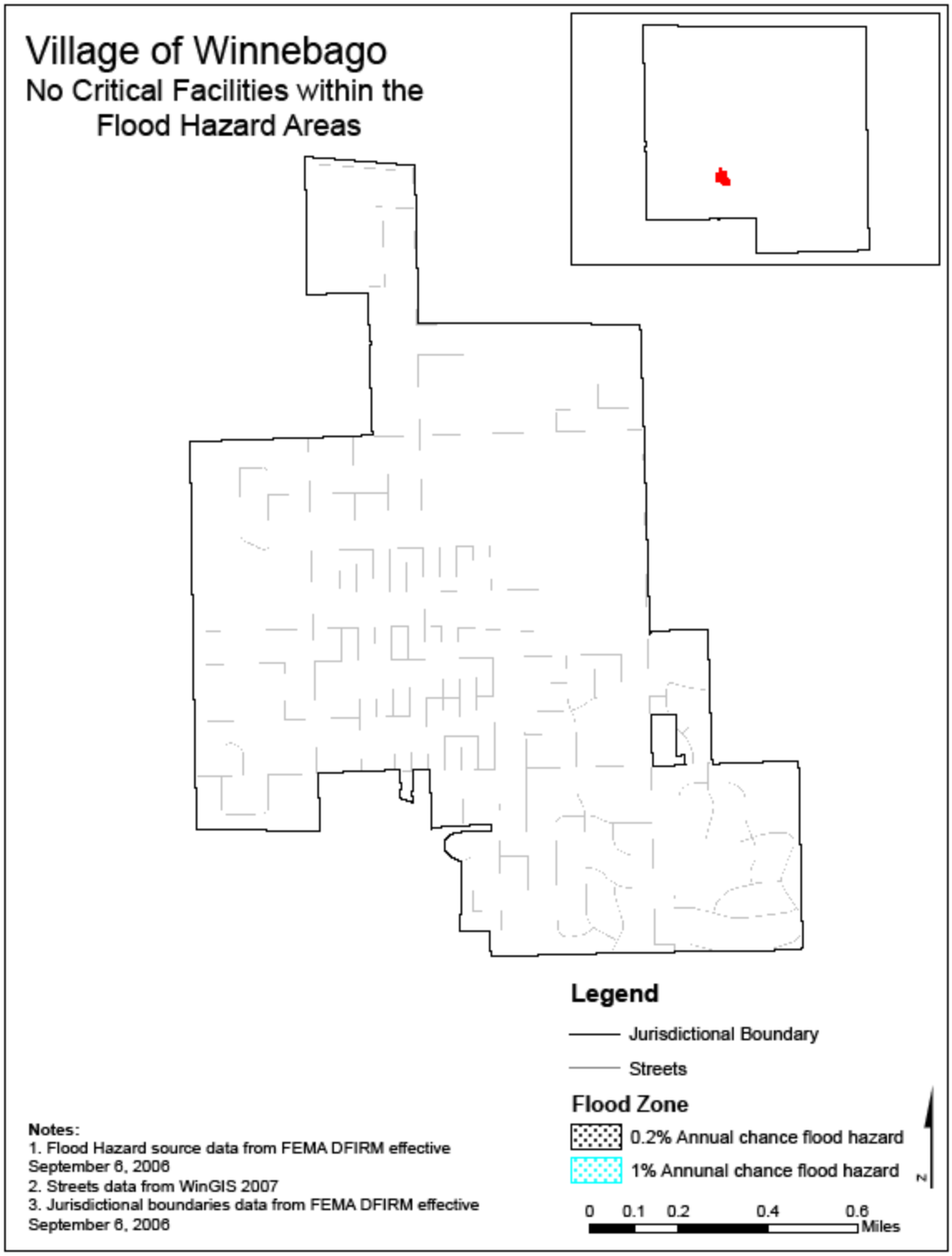


Figure 38. Village of Winnebago Critical Facilities within Flood Hazards

Repetitive Loss. Within Winnebago County there are 132 repetitive loss structures. Twelve repetitive losses have been in the Village of Machesney Park with a total paid amount of $281,329.83. The City of Rockford has 101 repetitive loss structures with a total paid amount of $4,977,329.02. The Village of Roscoe has 3 repetitive loss structures with a total paid amount of $112,031.63. Winnebago County Unincorporated has 18 repetitive loss structures with a total paid amount of $318,270.93. The total amount that has been paid out for repetitive loss structures for the entire Winnebago County area is $5,692,603.84.

The following table lists the repetitive loss structures by jurisdiction and shows the number of repetitive losses per structure, the total amount paid, and whether the owners had flood insurance.

Table 48. Repetitive Loss Properties

Community	No. of Losses to date	Insured?	Total Amt Paid
Village of Machesney Park	2	Yes	$46,248.68
Village of Machesney Park	2	Yes	$4,072.55
Village of Machesney Park	3	Yes	$37,282.05
Village of Machesney Park	5	No	$58,726.61
Village of Machesney Park	5	Yes	$7,776.75
Village of Machesney Park	2	Yes	$2,073.12
Village of Machesney Park	4	No	$51,185.79
Village of Machesney Park	2	No	$11,632.90
Village of Machesney Park	2	No	$19,220.41
Village of Machesney Park	2	Yes	$17,669.51
Village of Machesney Park	2	No	$5,505.83
Village of Machesney Park	2	Yes	$19,935.63
City of Rockford	3	Yes	$21,711.80
City of Rockford	3	Yes	$21,206.84
City of Rockford	2	No	$9,359.85
City of Rockford	2	No	$8,550.25
City of Rockford	2	No	$14,222.89
City of Rockford	2	Yes	$42,127.85
City of Rockford	2	Yes	$41,099.56
City of Rockford	2	Yes	$60,253.64
City of Rockford	2	Yes	$17,815.61
City of Rockford	2	Yes	$18,279.21
City of Rockford	2	Yes	$11,779.79
City of Rockford	2	Yes	$25,492.74
City of Rockford	2	Yes	$21,688.98
City of Rockford	2	Yes	$17,825.53
City of Rockford	2	Yes	$13,505.14
City of Rockford	2	Yes	$45,625.47
City of Rockford	2	Yes	$55,629.60
City of Rockford	2	Yes	$76,420.72
City of Rockford	2	Yes	$71,491.67
City of Rockford	2	Yes	$17,849.07
City of Rockford	2	Yes	$24,885.79
City of Rockford	2	Yes	$75,915.47
City of Rockford	2	Yes	$83,728.19
City of Rockford	2	Yes	$11,469.95
City of Rockford	2	Yes	$14,697.16

Table 48. Repetitive Loss Properties

Community	No. of Losses to date	Insured?	Total Amt Paid
City of Rockford	2	Yes	$29,474.38
City of Rockford	2	Yes	$17,518.16
City of Rockford	2	Yes	$31,991.69
City of Rockford	2	Yes	$13,175.27
City of Rockford	2	Yes	$60,107.13
City of Rockford	2	Yes	$26,496.72
City of Rockford	2	Yes	$15,225.27
City of Rockford	2	Yes	$45,870.74
City of Rockford	2	Yes	$136,499.16
City of Rockford	2	Yes	$52,267.07
City of Rockford	2	Yes	$6,606.77
City of Rockford	2	Yes	$6,971.79
City of Rockford	2	Yes	$41,966.21
City of Rockford	2	Yes	$130,694.40
City of Rockford	2	Yes	$30,821.01
City of Rockford	2	Yes	$77,627.30
City of Rockford	2	Yes	$20,337.33
City of Rockford	2	Yes	$124,991.10
City of Rockford	2	Yes	$97,382.71
City of Rockford	2	Yes	$18,840.60
City of Rockford	2	Yes	$16,639.92
City of Rockford	2	Yes	$35,106.45
City of Rockford	2	Yes	$5,259.74
City of Rockford	2	Yes	$14,548.16
City of Rockford	2	Yes	$7,160.10
City of Rockford	2	Yes	$13,740.93
City of Rockford	2	Yes	$26,266.58
City of Rockford	2	Yes	$15,900.57
City of Rockford	2	Yes	$28,870.34
City of Rockford	2	Yes	$11,250.68
City of Rockford	2	Yes	$33,472.70
City of Rockford	2	Yes	$11,053.68
City of Rockford	2	Yes	$27,695.43
City of Rockford	2	Yes	$23,212.19
City of Rockford	2	Yes	$14,108.92
City of Rockford	2	Yes	$22,876.17
City of Rockford	2	Yes	$31,200.98
City of Rockford	2	Yes	$12,562.01
City of Rockford	2	Yes	$73,560.61
City of Rockford	2	Yes	$22,081.00
City of Rockford	2	Yes	$22,910.77
City of Rockford	2	Yes	$16,605.24
City of Rockford	2	Yes	$21,918.38
City of Rockford	2	Yes	$45,889.34
City of Rockford	2	Yes	$257,198.70
City of Rockford	2	Yes	$25,276.15
City of Rockford	2	Yes	$12,885.82
City of Rockford	2	Yes	$12,701.47
City of Rockford	2	Yes	$38,601.78

Table 48. Repetitive Loss Properties

Community	No. of Losses to date	Insured?	Total Amt Paid
City of Rockford	2	Yes	$44,703.70
City of Rockford	2	Yes	$29,135.23
City of Rockford	2	Yes	$14,427.62
City of Rockford	2	Yes	$57,405.48
City of Rockford	2	Yes	$23,580.91
City of Rockford	2	Yes	$45,983.56
City of Rockford	2	Yes	$13,570.35
City of Rockford	2	Yes	$18,082.95
City of Rockford	2	Yes	$53,256.72
City of Rockford	2	Yes	$34,494.59
City of Rockford	2	Yes	$74,380.77
City of Rockford	2	Yes	$23,566.34
City of Rockford	2	Yes	$47,126.77
City of Rockford	2	Yes	$23,849.66
City of Rockford	2	Yes	$28,965.95
City of Rockford	2	Yes	$17,008.95
City of Rockford	2	Yes	$396,978.05
City of Rockford	2	Yes	$1,000,000.00
City of Rockford	2	Yes	$18,167.75
City of Rockford	2	Yes	$13,283.43
City of Rockford	2	Yes	$81,948.75
City of Rockford	2	Yes	$7,500.19
City of Rockford	2	Yes	$14,997.70
City of Rockford	2	Yes	$25,411.89
City of Rockford	2	Yes	$80,205.40
City of Rockford	2	Yes	$12,949.72
City of Rockford	2	Yes	$68,294.20
Village of Roscoe	3	No	$86,161.16
Village of Roscoe	2	No	$4,094.97
Village of Roscoe	4	No	$21,775.50
Winnebago County	5	No	$44,279.65
Winnebago County	7	Yes	$67,722.77
Winnebago County	2	No	$6,411.50
Winnebago County	2	No	$6,553.78
Winnebago County	5	SDF	$16,676.96
Winnebago County	2	No	$7,083.40
Winnebago County	2	Yes	$4,318.42
Winnebago County	2	No	$5,153.42
Winnebago County	4	No	$25,540.04
Winnebago County	3	Yes	$21,929.35
Winnebago County	2	No	$4,400.80
Winnebago County	3	Yes	$20,404.63
Winnebago County	3	No	$11,981.91
Winnebago County	3	Yes	$16,343.66
Winnebago County	2	No	$9,030.17
Winnebago County	3	Yes	$37,529.22
Winnebago County	2	No	$12,911.25
Winnebago County	2	No	$3,642.43
		TOTAL:	**$5,692,603.84**

It is a goal of each jurisdiction to reduce or eliminate repetitive loss throughtout the county.

3.3.5 Assessing Vulnerability – Analyzing Development Trends

Population is major component to estimating risk and should be considered when assessing vulnerability to natural hazards.

3.3.5.1 Existing Population at Risk

Severe storms, severe winter storms, drought, extreme heat, earthquakes and tornados can occur anywhere within Winnebago County. As a result, all population throughout the County is at risk to these natural hazards. Flood risk, however, is unique in that this risk is focused to areas near or adjacent to streams. The Planning Team agreed that flood vulnerability is best estimated in areas mapped as FEMA recognized floodplains. Therefore, residential population residing within these flood boundaries assumes a higher risk.

The two tables presented below identify population demographics for areas at risk to Winnebago County natural hazards.

Table 49. Population Vulnerability – Countywide – 2000 Census

Jurisdiction	Population	% of Total	Pop. 65+	%65+	Female	Male
Village of Cherry Valley	2,191	0.8%	175	8.0%	1,088	1,103
Village of Durand	1,081	0.4%	147	13.6%	563	518
City of Loves Park	2,044	0.7%	231	11.3%	10,230	9,814
Village of Machesney Park	20,759	7.5%	1,931	9.3%	10,460	10,299
Village of New Millford	541	0.2%	49	9.1%	252	289
Village of Pecatonica	1,997	0.7%	298	14.9%	1,043	954
City of Rockford	150,115	53.9%	21,166	14.1%	77,731	72,384
Village of Rockton	5,296	1.9%	519	9.8%	2,680	2,616
Village of Roscoe	6,244	2.2%	418	6.7%	3,136	3,108
City of South Beloit	5,397	1.9%	696	12.9%	2,725	2,672
Village of Winnebago	2,958	1.1%	246	8.3%	1,524	1,434
Winnebago County Unincorporated	79,795	28.7%	10,134	12.7%	30,791	31,004
Total County	**278,418**	**100.0%**	**36,010**	**12.9%**	**142,223**	**136,195**

Table 50. Flood Prone Population Characteristics-2000 Census

Jurisdiction	Population Vulnerable	% of Total
Village of Cherry Valley	250	11.4%
Village of Durand	76	7.0%
City of Loves Park	1,193	58.4%
Village of Machesney Park	3,321	16.0%
Village of New Millford	32	5.9%
Village of Pecatonica	68	3.4%
City of Rockford	3,363	2.2%
Village of Rockton	185	3.5%
Village of Roscoe	792	12.7%

Table 50. Flood Prone Population Characteristics-2000 Census

Jurisdiction	Population Vulnerable	% of Total
City of South Beloit	895	16.6%
Village of Winnebago	0	0.0%
Winnebago County Unincorporated	6,727	8.4%
Total County	**16,902**	**6.1%**

Population estimates for areas within a mapped flood hazard were based upon average occupancy per structure for residential parcels. Averages occupancies were provided from the 2000 US Census and ranged from 2.44 to 2.93 people per structure depending upon jurisdiction.

3.3.5.2 Population and Developmental Trends

Winnebago County experienced its two most significant growth periods between 1910 and 1930 and then again between 1950 and 1970. From 1970 to 1990, population growth remained largely stagnant. Growth resumed at a rate of 10% between 1990 and 2000. The US Census estimates Winnebago County's population in 2005 at 292,714- an increase of 5.1% since 2000 and 15.7% since 1990. The projected 2015 population is estimated at 320,683 which is a projected growth rate of 15% since 2000 and 9.6% since 2005. The projected 2030 population is estimated at 347,970, which is a projected growth of 12.2% since the 2015 estimate. These figures indicate that the County, on the whole, is on an upswing in terms of population growth.

The following chart shows that Winnebago County has a large population density and that is continuing to grow.

Table 51. Population Density as of 2005

County/Jurisdiction	Area (sq. miles)			Density (People per sq. mile)		
	Total	Land	Water	1990	2000	2005
Winnebago County	519.2	513.7	5.5	492.3	541.9	561.3
Cherry Valley	3.8	3.8	0.1	423.9	583.3	593.6
Village of Durand	0.9	0.9	0.0	1,222.2	1,200.9	1,200.0
City of Loves Park	14.5	14.2	0.4	1,063.4	1,411.0	1,625.1
Village of Machesney Park	12.4	12.0	0.4	1,584.8	1,728.8	1,822.6
Village of New Millford	1.1	1.1	0.0	424.8	496.6	507.3
Village of Pecatonica	1.3	1.2	0.0	1,419.4	1,607.2	1,746.0
City of Rockford	56.7	56.0	0.7	2,489.3	2,680.4	2,742.9
Village of Rockton	3.7	3.5	0.2	832.0	1,505.5	1,533.5
Village of Roscoe	9.3	9.3	0.1	224.8	675.1	940.1
City of South Beloit	4.1	4.0	0.1	1,028.3	1,362.9	1,385.6
Village of Winnebago	1.4	1.4	0.0	1,323.7	2,125.3	2,210.1
Winnebago County Unincorporated	410.0	406.4	3.6	*NA	196.3	*NA

Source: Census. Gov

* US Census does not provide population density values for unincorporated Winnebago County.

Winnebago County's Findings Memo: Comprehensive Land Use Plan Update & Unified Development Ordinance Creation states: "Like Winnebago County, Rockford's growth rate

was highest between 1910 and 1930 and then again between 1960 and 1970. Rockford lost population between 1970 and 1980, saw almost no change from 1980 to 1990, and grew only 8% between 1990 and 2000. In contrast, the fastest growing municipalities in 2000 were Roscoe, Rockton and Winnebago, which grew 200%, 81% and 61% from 1990 to 2000 respectively. In terms of the second and third largest population concentrations in the County, Machesney Park was only recently incorporated (in the 1990s) and grew 9% from 1990 to 2000. Loves Park has been enjoying a significant positive growth rate since its incorporation in the 1950s. The unincorporated area of the County has been losing population over the past twenty years–a 25% decrease from 1980 to 1990, and 2% decrease from 1990 to 2000. However, this is most likely due to annexation of land area by incorporated municipalities, rather than out-migration. Some incorporated municipalities' growth is due to annexation of land along municipal boundaries that was previously developed. As the County drafts its land use plan, the anticipated growth of the incorporated municipalities will be a key component of land use strategies. In particular, how the municipalities plan to accommodate future growth and their annexation strategies should be examined, especially along the 1½ mile planning jurisdiction outside the corporate limits that the municipalities share with the County."

Winnebago County has shown impressive gains in population over the past 10 years. There are several reasons behind this growth. One source of increased population in Winnebago County is the increased migrant numbers. The following pie chart details the influx of migrants into Winnebago County between 2000 and 2001 by origin.

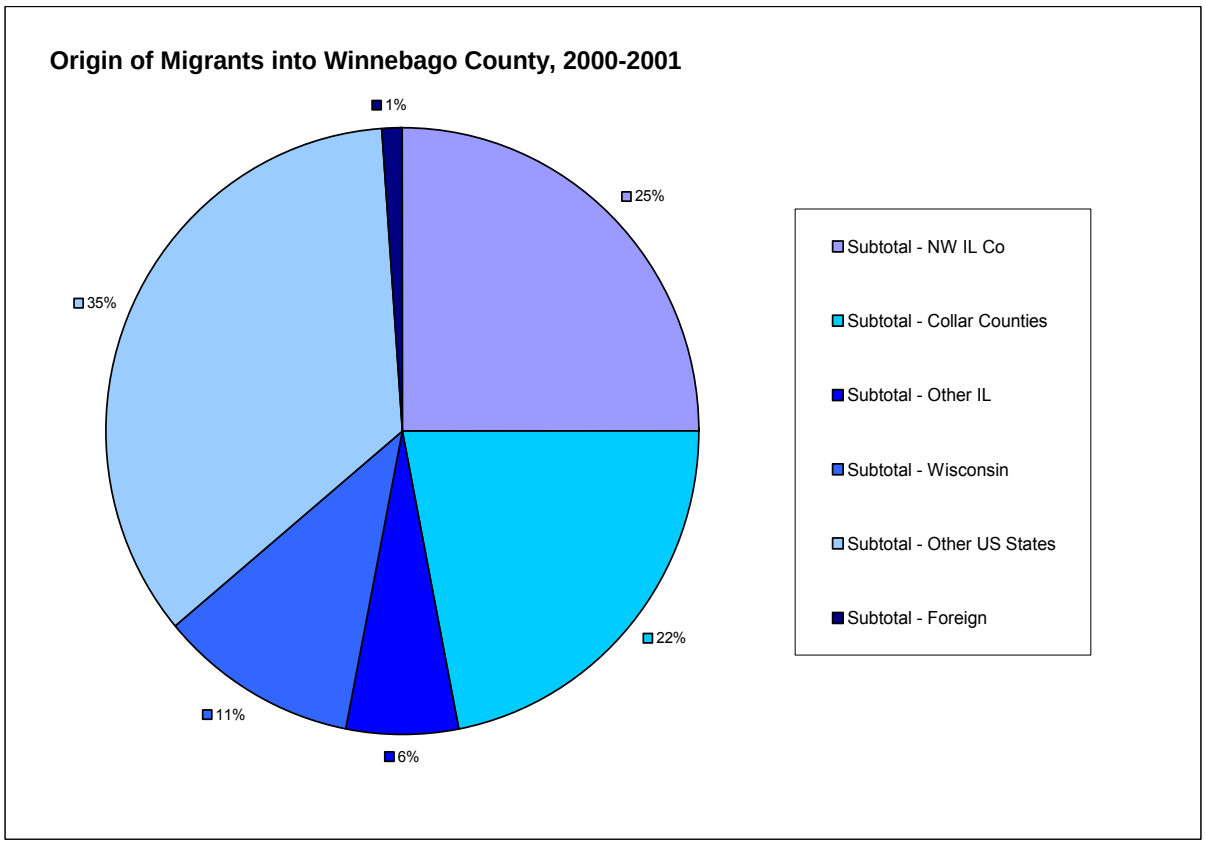


Figure 39. Origin of Migrants into Winnebago County, 2000-2001

Source: Internal Revenue Service

As you can see from the chart above, the most significant source of migrants are from other US States and from within Illinois State.

Another source of increase population is the average household size within Winnebago County has increased. The average family size decreased from 1980 to 2000, then increased in 2005. Typically, a smaller family size means fewer children and an aging population, also known as the empty-nester effect. The 2005 upswing in family size suggests that families with more children may be locating to the County which is leading to an increased overall population.

Non-family households in Winnebago County defined by the Census as single individuals living alone or households consisting of unrelated individuals, has gradually increased – from 29% to 33% of all households. This also has been a cause of the uprising population in Winnebago County.

Land use in the county has also changed with the increasing population and with the development of a new land use plan. According to the Winnebago County Comprehensive Land Use Plan **"**Growth and annexation must be focused on supporting the principals of 'balanced growth' by preserving open space and natural areas, reducing traffic congestion, utilizing existing infrastructure and resources, and preserving the quality of life within our community." This being said, one-third of the County's homes were built between 1940 and 1959. Between 1960 and 1979, in correlation with the population boom of that same time period, another third of the County's homes were constructed (36,597 homes over the 20 year period of 1960 to 1979). As the population growth slowed, so did home construction. Between 1980 and 1989 only 11,746 homes were built. Since 1990, again in line with positive population growth, home construction has picked up. The distribution of population throughout Winnebago County will depend on the geography of residential development, vacancy rates, and household size. The vacancy rate as a whole is currently projected to stay at about 6% while housing growth is expected to continue throughout most of the county.

The following charts are population pyramids for Winnebago County. Notice the change in population by gender and also by age. The greatest change in the pyramids will occur as the baby boomers continue to age and move up the pyramid over time.

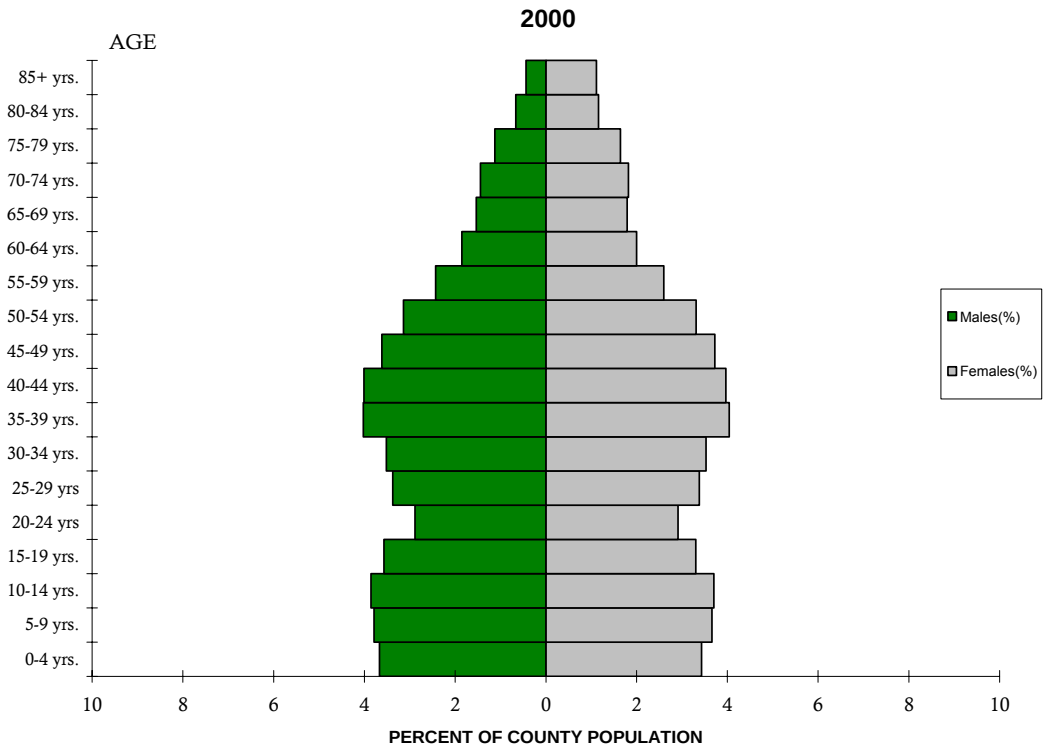


Figure 40. Winnebago County Population Pyramid, Year 2000

Figure 41. Winnebago County Population Pyramid, Year 2005

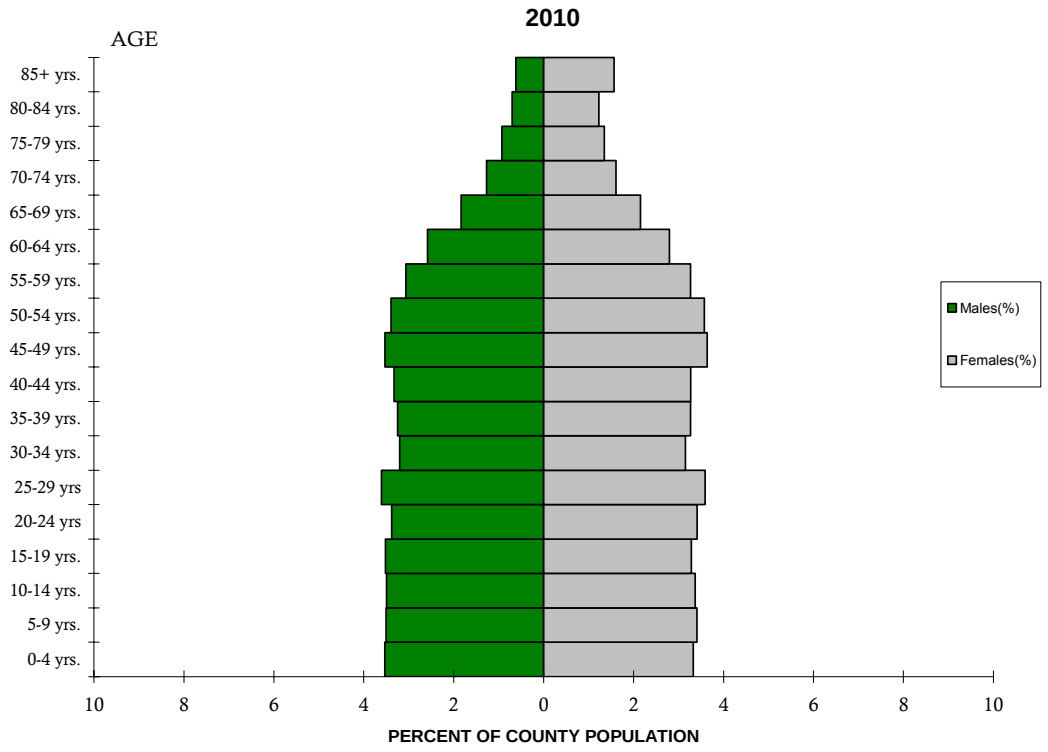


Figure 42. Winnebago County Population Pyramid, Year 2010

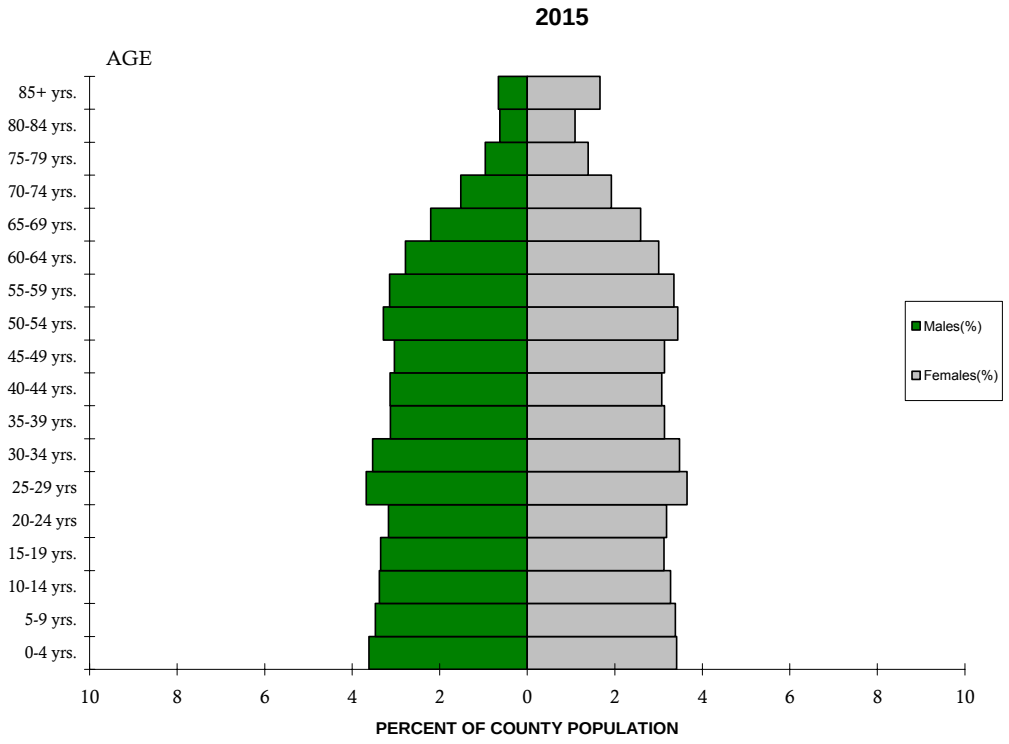


Figure 43. Winnebago County Population Pyramid, Year 2015

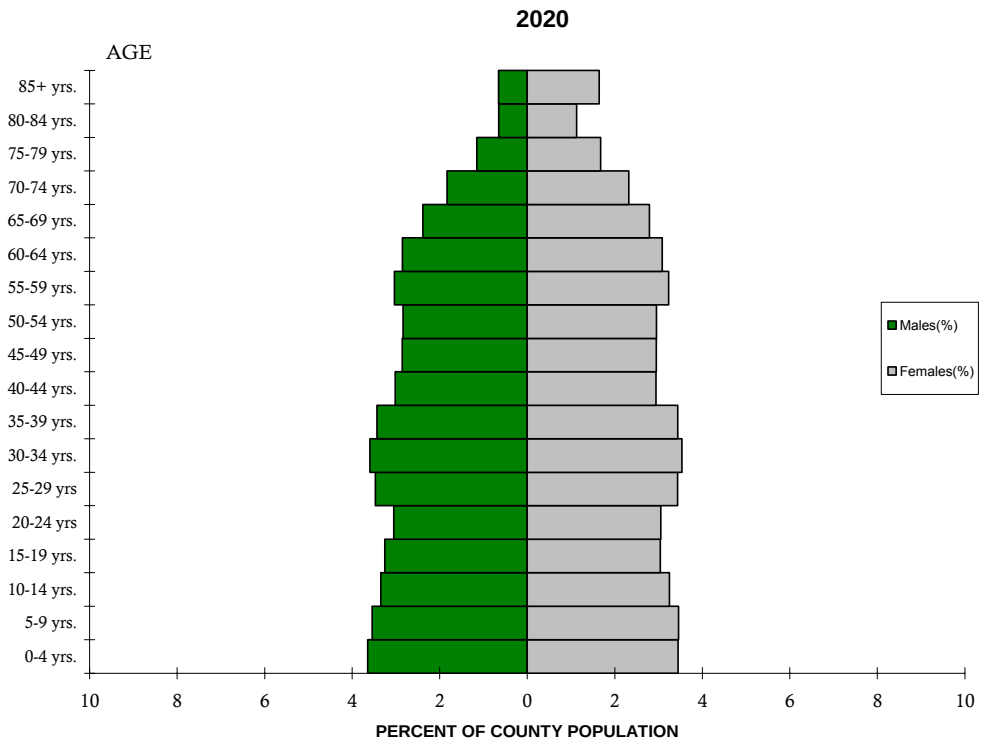


Figure 44. Winnebago County Population Pyramid, Year 2020

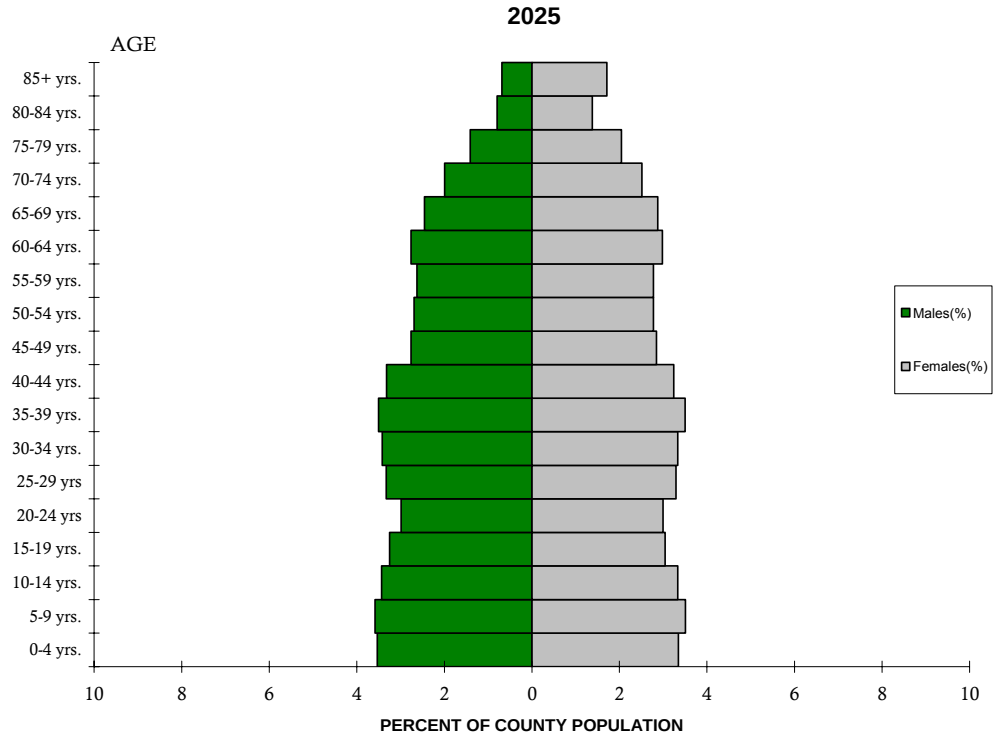


Figure 45. Winnebago County Population Pyramid, Year 2025

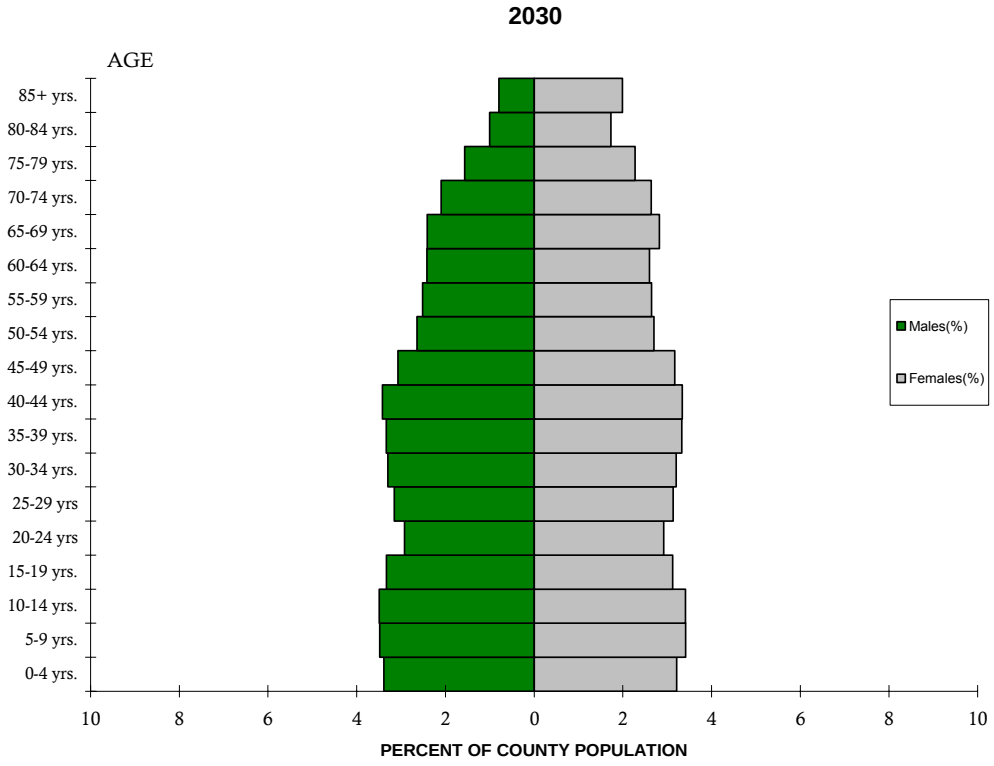


Figure 46. Winnebago County Population Pyramid, Year 2030

See Appendix H for a current land use map of Winnebago County and the 2010 future land use map for Winnebago County.

4. Mitigation Strategy

The Mitigation Strategy portion of this plan leverages the results of the hazard identification and vulnerability assessment to identify local risk reduction goals and actions. The process incorporated participation and coordination amongst the Planning Team to develop goals and actions that were specific, measurable, achievable, relevant and time or schedule dependent.

The mitigation strategies developed within the Plan provide a blueprint for reducing the potential losses identified in the risk assessments and does not conflict with existing authorities, policies, programs and resources.

4.1. Definition of Mitigation

Mitigation is defined as “sustained action that reduces or eliminates long-term risk to people and property from hazards and their effects.” Mitigation is the ongoing effort at the federal, state, local and individual levels to decrease the impact of disasters upon families, homes, the jurisdiction and the economy. Mitigation also includes making existing and future development in hazard prone areas safer. A jurisdiction can steer growth to areas with fewer risks, through non-structural measures such as avoiding construction in flood-prone areas. Preventing damages or loss to lives or property is the essence of mitigation. Incorporating

mitigation into decisions relating to a jurisdiction's growth can result in a safer, more resilient jurisdiction, and one that is more attractive to families and businesses.

4.2. Local Hazard Mitigation Goals

The Mitigation Strategy was developed through a series of Planning Team working sessions and phone conversations. The Planning Team members worked together to develop and complete a series of community mitigation worksheets. These worksheets required communities to work with local resources to develop mitigation goals, activities, priorities, and capabilities.

During the November 8, 2007 Planning Team and public stakeholder meeting, the Team reviewed the hazards profiles and results of the vulnerability assessments. Together the group worked to identify general problems, concerns, and specific activities to mitigate each of the hazards present throughout the County. As a result of the process, the group ultimately developed several mitigation goals to reduce or avoid long-term vulnerabilities for hazards within each jurisdiction. These goals are provided in Tables 53 thru 64.

4.3. Identification and Analysis of Mitigation Activities

The Planning Team worked together and individually throughout the planning process to identify, evaluate and analyze a comprehensive range of specific mitigation actions. These actions were based on the evaluation of the risk assessment and in coordination with the mitigation goals that were formed by each jurisdiction.

Mitigation Activities by Type

The group focused upon various levels of activities that could be performed to reduce the risk of natural hazards throughout their communities. These activities were categorized as follows:

a. Prevention.(PA) Prevention activities are designed to keep current problems from getting worse and to eliminate the possibility of future problems. Prevention activities reduce a jurisdiction's vulnerability to hazard events. This type of activity is especially effective in hazard prone areas where development has not occurred. Prevention activity examples include the following:

    1) Planning and Zoning
    2) Floodplain regulations
    3) Local ordinances.

b. Property Protection.(PP) Property protection activities are designed to adapt existing structures to withstand natural hazards or to remove structures away from hazard prone areas. Property protection activity examples include the following:

    1) Acquisition
    2) Relocation
    3) Foundation elevation
    4) Insurance – flood and homeowner's

5) Retrofitting (includes activities such as wind proofing, flood proofing, and seismic design standards)

c. Emergency Services.(ES) Emergency services minimize the impact that a natural hazard has on the residents of a jurisdiction. Usually, actions are taken by emergency response services immediately before, during, or in response to a hazard event. Emergency service activity examples include the following:

1) Warning systems
2) Evacuation planning and management
3) Sandbagging for flood protection

d. Structural Projects.(SP) Structural projects lessen the impact of a natural hazard by changing the natural progression of the hazard. These types of projects are usually designed by engineers. Structural projects include the following:

1) Storm sewers
2) Floodwalls
3) Highway projects
4) Tornado shelters.

e. Public Information and Awareness.(PI) Public information and awareness activities are used to educate the residents of a jurisdiction about the potential hazards that affect their area, hazard prone areas, and mitigation strategies they can take part in to protect themselves and their property. Public information and awareness activity examples include the following:

1) Public speaking events
2) Outreach projects
3) Availability of hazard maps
4) School programs
5) Library materials

4.4. Implementation of Mitigation Activities

Each jurisdiction's Plan representative(s) worked with community resources to develop mitigation activities based upon local vulnerabilities and capabilities. These actions were identified and prioritized using a prioritization scheme, generalized benefit / cost approach, and funding identification strategy. For each action developed, an action administrator or authority was defined along with an estimated timeframe for completing the activity.

The action plan recognizes, when possible, mitigation projects that can be implemented through existing programs and integrated into job descriptions, comprehensive plans, capital improvement plans, zoning and building codes, permitting, and other planning tools, where appropriate. Fortunately, many of the agencies who are implementing the Action Plan are members of the Planning Team.

The hazard mitigation actions developed were prioritized based upon each action's ability to eliminate or reduce risk, the category of activity performed, the generalized benefit to cost of each activity and its potential for funding.

4.4.1. Activity Prioritization

The Planning Team prioritized each activity based upon its ability to eliminate or reduce risk associated with mitigation goal. The following table was used to categorize each activity's priority as listed within Tables 53 and 64.

Table 52. Activity Prioritization

Priority	Description
A-Very High	Priority A projects permanently eliminate damages or significantly reduce the probability of deaths and injuries in a specified area. Priority A projects mitigate my community's most significant hazards. Priority A is also given to other activities that have a high probability of systematically reducing damages or deaths and injuries across a wide area from one or more of my community's most significant hazards.
B-High	Priority B projects permanently reduce damages in a specified area from one of my community's most significant hazards. Priority B is also given to other activities with the potential for reducing damages, deaths and injuries across a wide area from one or more of my community's most significant hazards.
C-Medium	Priority C projects, or activities, help alert the public to the approach of a threat from any of my community's hazards, or educate the public about the need for disaster preparedness and mitigation.
D-Low	Priority D projects, or activities, permanently reduce damages or significantly reduce the probability of deaths and injuries in a specified area from one of my community's less significant hazards.

4.4.2. Activity Benefit Cost Review

The Planning Team also considered the return on investment for each activity. This benefit-cost review was performed on a qualitative basis. This review considered each activity's benefit as a function of its ability to permanently eliminate or reduce risk (i.e. High, Medium, and Low). The costs to implement each activity were also examined qualitatively using a similar convention. The result produced a generalized approach for assessing relative benefits to cost. The Planning Team agreed that more detailed benefit cost analysis would be performed as necessary prior to the implementation of each activity. In cases of activities identified for funding through FEMA mitigation programs, the group recognized that FEMA approved benefit-cost analysis would be required.

4.4.3. Activity Funding and Implementation

The Planning Team considered and identified the funding resources that may be available for each activity. In several instances, local funding is already set aside to perform the identified activities. The planning effort revealed that several jurisdictions already have programs and capabilities in place to administer risk reduction measures. Each activity defined by a given

jurisdiction was required to identify a lead agency or personnel responsible for implementing the activity.

4.5. Multi-Jurisdictional Mitigation Activities

Mitigation goals and actions for each community are summarized in the following tables. Actions identified by each community will be reviewed annually for purposes of tracking progress and or revising implementation approaches.

The following table lists mitigation actions for each jurisdiction by hazard. These actions would mitigate the associated hazard and support the corresponding goals of the community. Below are descriptions and definitions of each category within the following tables.

- The primary hazard (s) addressed by each mitigation activity.
- The type of activity or project to be imp
- The lead implementer or contact is the person, department, company, responsible for each action listed.
- The proposed schedule or time frame each jurisdiction intends to complete their action or project.
- Funding budget considerations for each activity.
- The priority rankings for each activity.
- The category of family type or each activity.
- The benefit-cost analysis was completed whereby the higher the action's priority, the more cost beneficial the action was determined to be for the community.
- The structures category highlights whether the activity reduces the effects of the hazard on both new and existing structures within the community.

Village of Cherry Valley's Action Plan Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards.
- Goal 2: Minimize the loss of property and damage due to hazards.

Table 53. Village of Cherry Valley's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-2	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce soil erosion control on all new developments	Cherry Valley Public Works Department	ongoing/ as needed	TBD	D	PA	1,2	Medium/Low	New Structures
FLOODING, SEVERE STORMS, SEVERE WINTER STORMS	Maintain storm water outlets and inlets	Cherry Valley Public Works Department	ongoing/ as needed	TBD	B	SP	1,2	High/Medium	Existing Structures
FLOODING	Comply/ enforce floodplain building code restrictions	Cherry Valley Engineering	as needed	TBD	B	PA	1,2	High/Low	New and Existing Structures
FLOODING	Reduce effects of flooding by clearing creeks of debris and sending violation letters to property owners with obstructions	Cherry Valley Public Works Department	Yearly	TBD	B	PA	1,2	High/Medium	N/A
FLOODING	Modify/maintain Regional Detention Pond south of VanDiver Road	Village of Cherry Valley	2008	TBD	B	SP	1,2	High/High	Existing Structures

Village of Durand's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Minimize the loss of property and damage due to hazards
- Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 4: Enhance existing public services and response time to hazards

Table 54. Village of Durand's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Collect and assemble critical facilities building locations	Village of Durand	ongoing	TBD	B	PA	1,3,4	High/Low	N/A
ALL HAZARDS	Minimize the loss of power/utilities; develop cross information management	Fire Department, Police Department, EDSA, ComEd	2008	General Funds	B	PA	4	High/High	N/A
ALL HAZARDS	Collect and assemble building values for critical facilities	TBD	TBD	General Funds	B	PA	3,4	High/Low	N/A
ALL HAZARDS	Establish an Emergency Response Assessment Team which will assess types of damage, number or damaged buildings, and dollar amounts	TBD	2008	TBD	B	PA	3,4	High/Low	N/A
DROUGHT	Educate/notify public on water restrictions and drought	DPW	2007	TBD	C	PI	3	High/Low	N/A
DROUGHT	Pass and Install further ordinances for reduction in fresh water waste	DPW	2008	TBD	D	PA	3,4	High/Low	N/A
EXTREME HEAT	Partner with local non-profit organizations to establish cooling centers	Police Department, Fire Department, EC	2008	TBD	D	SP	1,4	High/Medium	New Structures
FLOODING	Prevent buildings from being built in the current floodplains by enforcing floodplain ordinance regulations	Village of Durand	ongoing	TBD	B	PA	1,2	High/Low	New Structures
FLOODING	FWEEPs (Flood warning and emergency evacuation plans): List all locations for evacuation upon possibility of dam bursting	Police Department, Fire Department, ESDA	2008	General Funds, Winnebago County	A	PA	1,3,4	High/Low	N/A

Table 54. Village of Durand's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
SEVERE STORM and TORNADOES	Monitor, test, and utilize local outdoor warning system	Fire Department	ongoing	Fire Department, General Funds, Winenbago County	B	PA	1,3,4	High/Low	New and Existing Structures
SEVERE STORM and TORNADOES	Encourage and promote safe rooms, especially in new construction	Insurance Companies, Builders	2009	TBD	C	PA	1,3	High/Low	New Structures
SEVERE WINTER STORMS	Clear road of snow and ice following winter storm event	DPW	ongoing	Winnebago County	B	PA	1,4	High/High	N/A

City of Loves Park's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Minimize the loss of property and damage due to hazards
- Goal 3: Strengthen relationships between separate units of government
- Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 5: Build on existing GIS capabilities in Winnebago County
- Goal 6: Minimize the loss of utilities during hazards.

Table 55. City of Loves Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-6	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce existing City codes and ordinances such as development, building, and flood control	Loves Park	ongoing	Local	B	PA	1,2,3,6	High/Low	New Structures
ALL HAZARDS	Strengthen GIS Database with Hazard Data	Loves Park, WinGIS	ongoing	Local	D	PA	3,5	High/Low	N/A
ALL HAZARDS	Increase and strengthen police and fire outreach, eduction, and prevention programs	Loves Park Police and Fire Department	ongoing	Local	C	PI	4	High/Low	N/A
ALL HAZARDS	Monitor, test, and utilize warning siren system	Loves Park	ongoing	Local	B	PA	4	High/Low	N/A

Table 55. City of Loves Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-6	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
DROUGHT	Improve utility company communication to customers during periods of water usage restrictions	Loves Park Public Works / Media	as needed per event	Local	C	PI	4,6	High/Low	N/A
FLOODING	Monitor and maintain existing streams and channels within Loves Park	Loves Park, USACE	ongoing	Local	B	SP	1,2	High/High	New and Existing Structures
FLOODING	Develop a study and implement improvements to the Howard Creek Drainage Basin	Loves Park/ Landowners	2008	Local- TIF, General	B	SP	1,2	High/Medium	New and Existing Structures
FLOODING	Develop and monitor a repetitive loss list and incorporate into a GIS	Loves Park, WinGIS	ongoing	Local	B	PA	1,2,5	High/High	N/A
SEVERE WINTER STORM	Develop regional salt storage facilities in the area	Loves Park, Winnebago County	ongoing	Local	B	SP	1	High/Medium	New Structures
SEVERE WINTER STORM, SEVERE STORM	Develop regulations to require below-grade utility installations in new development	Loves Park, Utilities	ongoing	Local	B	PA	2,6	High/High	New Structures

Village of Machesney Park's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Minimize the loss of property and damage due to hazards
- Goal 3: Enhance existing public services and response time to hazards
- Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 5: Minimize the loss of utilities to hazards

Table 56. Village of Machesney Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce building code review and inspection	Winnebago County, State of Illinois	ongoing	Permit Fees	B	PA	1,2	High/Low	New and Existing Structures
ALL HAZARDS	Conduct yearly "right of way" tree trimming	IHDA	Yearly	IHDA, General Funds	D	PA	2,5	Medium/Low	New and Existing Structures
ALL HAZARDS	Improve low-income residential structures to meet minimum health and safety standards	IHDA	Yearly	IHDA, General Funds	B	PP	1,2,3	High/Medium	New and Existing Structures
ALL HAZARDS	Establish policy which coordinates Village, Winnebago County, fire and utility provider response to natural hazards	Winnebago County, Fire Department, North Park Water, Rock River Water	2008	General Funds, Grants	B	PA	1,3	High/Low	N/A
ALL HAZARDS	Increase community awareness, education, and understanding of natural hazards	Village of Machesney Park, Utilities, Public Works	2008	General Funds, Grants	C	PI	4	High/Low	N/A
DROUGHT	Establish policy coordinating Village and North Park Water response to drought	North Park Public Water	2008-2009	General Funds, Grants	D	PA	1,3	High/Medium	N/A
EXTREME HEAT	Open cooling centers at Village Hall to public during high heat events	Village Hall	as needed	General Funds	D	ES	1,3	High/Low	Existing Structures
EXTREME HEAT	Establish formal policy for cooling centers and coordinate with other governmental agencies to help reduce heat related health issues	Other governmental agencies	2008-2009	General Funds, Grants	D	ES	1,3	High/Medium	Existing Structures
FLOODING	Reduce the number of properties at risk for flooding; Comply with Flood Hazard and Storm Water	FEMA/ IDNR	ongoing	Permit Fees, General Funds	B	PA	2	High/High	New and Existing Structures

Table 56. Village of Machesney Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	ordinances								
FLOODING	Provide sand bag materials to public during flooding events	Harlem Township	as needed	General Funds	B	ES	1,2,3	High/Medium	Existing Structures
FLOODING	Aquire property located within the NFIP designated floodway	FEMA/ IDNR	2008-2010	FEMA, Grants, General Funds	A	PP	1,2	High/High	Existing Structures
SEVERE WINTER STORM	Clear roads of ice and snow and salt roads during a winter storm event	Winnebago County	as needed	General Funds	A	ES	1,3	High/High	N/A

Village of New Millford's Action Plan and Mitigation Goals:

Goal 1: Reduce the life threatening effects of natural hazards on local populations (injuries / death)

Table 57. Village of New Millford's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Purchase and Implement warning siren system	New Millford	2008-2010	Local / HMGP	A	PA	1	High/ Medium	N/A

Village of Pecatonica's Action Plan and Mitigation Goals:

- Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
- Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
- Goal 3: Reduce physical / structural damages from natural hazards
- Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 5: Minimize the loss of utilities during hazards
- Goal 6: Aid citizens in essential services

Table 58. Village of Pecatonica's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-6	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Have arborist inspect, trim, and remove dead or damaged trees	Public Works / Citizens	ongoing	General Funds	D	PA	1,3,5	High/Low	New and Existing Structures
ALL HAZARDS	Buy an Emergency generator for water pump at well #1 & #2	Public Works, PDC	ongoing	General Funds / HMGP	A	PA	1,6	High/Medium	N/A
ALL HAZARDS	Buy a PIO drive for pump at well #1	Public Works, Local Farmers	ongoing	General Funds	B	PA	1,6	High/Medium	N/A
ALL HAZARDS	Buy Emergency generator for Police Department and Village Hall	Police Department, Village Hall	2008	HMGP	A	PA	1,2,5,6	High/Medium	Existing Structure
DROUGHT	Reduce risk to private well users by having water utility notify local authority of the drought	Public Works, Police Department, Media	ongoing	General Funds	C	PI	1,3,5,6	High/Low	N/A
DROUGHT	Partnership with Freeport for safe water delivery	VOP/Freeport	ongoing	General Funds	D	ES	1,6	Medium/Medium	N/A
EXTREME HEAT	Notify citizens of cooling center locations and offerings	Village Hall, Police Department, Public Works, Churches	ongoing	General Funds	C	PI	1,2,6	High/Low	N/A
SEVERE STORMS, TORNADOES, SEVERE WINTER STORMS	Install and maintain alarm systems	Police Department, Fire Department	2008	General Funds	B	PA	1,2,4	High/Medium	N/A
SEVERE STORMS, TORNADOES, SEVERE WINTER STORMS	Alert local citizens of hazards via media	Media	ongoing	TBD	C	P	1,2,4	High/Low	N/A

City of Rockford's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Minimize the loss of property and damage due to hazards
- Goal 3: Increase community awareness, education, and understanding of natural hazards and mitigation
- Goal 4: Encourage future policies and enforce current policies, procedures, and documents to reduce risk

Table 59. City of Rockford's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Follow load restrictions on building design, fire suppression requirements, and electrical/plumbing regulations	Building and Fire Departments	Ongoing	Fees and Property Taxes	D	PA	1,2,4	High/High	New and Existing Structures
ALL HAZARDS	Follow in place Plans/Procedures/Contacts/ Strategies for hazard situations	All Departments; Salvation Army; Red Cross; Hospitals; IEMA; EMTD; County Sheriff	Ongoing	FEMA Grant	B	PA	1,4	High/High	N/A
ALL HAZARDS	Promote Smart Growth by transitioning to Rail Plan, pedestrian path plan, population household forecasting and commuter patters	RATS; Public Works Department	Ongoing	IDOT and Federal Grants Metropolitan Planning Organization	D	PA	4	High/Low	New Structures
ALL HAZARDS	Develop public service announcements and educational material for each hazard	All City Departments, IEMA	2008-2009	Property Taxes, State Funds	C	PI	1,2,3	Medium/Low	N/A
ALL HAZARDS	Develop a community rating system	Public Works, Building and Comm. Dev. Departments	2008	Sales Tax	B	PA	3	High/Low	N/A
ALL HAZARDS	Accredidation of Fire Department	All City Departments	2008	Property Taxes	D	PA	3,4	High/Low	Existing Structures
ALL HAZARDS	Accredidation of Public Works	Public Works Department	2008-2012	Property Taxes	D	PA	3,4	High/Low	Existing Structures
DROUGHT	Restrict water usage during drought	Public Works department	Ongoing	Water Division	B	PA	1,3	High/Low	N/A
DROUGHT	Complete the $75 mil. Water Rehabilitation Program	Public Works	2008-2010	Water Billing	B	SP	1,2	High/High	New Structures
FLOODING	Enforce regulations, floodplain and detention requirements, and Clean Water Act	Building and Public Works	Ongoing	Fees and Property Taxes	B	PA	1,2,3	High/Medium	New and Existing Structures
FLOODING	Map repetitive loss and substantially damaged properties	Public Works, Building and Human Services Department	Ongoing	IEMA, Property and Sales Tax	B	PA	1,2,3	High/Low	New and Existing Structures

Table 59. City of Rockford's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
FLOODING	Map priority acquisition and unsuitable for development areas	Community Development, Public Works Department, Rockford Area Economic Development Council, RRWRD, Rockford Park District, Winn City Forest Pres.	Ongoing	Property Taxes	B	PA	1,2,3	High/Low	N/A
FLOODING	Floodproof, Relocate, Elevate, and Demolish at risk structures	Public Works, Human Services, Building, IEMA, FEMA	2008	Sales Tax, Property Tax, State and Federal Grants	A	PP	1,2	High/High	New and Existing Structures
FLOODING	Alpine Dam and Keith Creek Modernization	Public Works Department, State and Federal Governments, United States Corp of Engineers	2008-2010	Sales Tax, State and Federal Funds	A	SP	1,2	High/High	New and Existing Structures
FLOODING and DROUGHT	Enforce landscaping and buffer requirements, open space requirements, impervious ratio requirements, Rock River and Well Head Setback Overlay Districts	Community Development/Public Works	Ongoing	Fees and Property Taxes	B	PA	4	High/High	New and Existing Structures
FLOODING and DROUGHT	Enforce engineering design standards	Public Works department	Existing/ Under Revision	Property Taxes	B	PA	2,4	High/Low	New and Existing Structures
FLOODING and DROUGHT	Enforce flood mitigation, flood control, stormwater management, planning and $75 mil Water Rehabilitation Projects	Public Works department	Ongoing	Water Billing; Sales Tax, MFT Funds; State/Federal Grants	A	SP	2,4	High/High	New and Existing Structures
SEVERE WINTER STORMS	Follow parking restriction; allow arterial/residential plow routes; follow plowing/salting policies	Public Works	Ongoing	Property Taxes	B	PA	3,4	High/Low	N/A
SEVERE WINTER STORMS, SEVERE STORMS, TORNADOES	Enforce tree and bush trimming/pruning requirements/ planting and removal requirements	Public Works department	Ongoing	Property Taxes	C	PA	2,3,4	Medium/Medium	N/A

Village of Rockton's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Minimize the loss of property and damage due to hazards
- Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation

Table 60. Village of Rockton's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-3	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Monitor, test, and utilize warning siren system	Village of Rockton	Ongoing	Local	A	PA	1,3	High/Low	N/A
ALL HAZARDS	Create rapid response teams for down electrical lines, trees, etc	Village of Rockton, Public Works, Police Department, Fire Department	2007-2009	Local	A	PA	1,2	Medium/Low	N/A
ALL HAZARDS	Creat traffic flow paths for Emergency Vehicles during or after a natural hazard	Village of Rockton, Police Department, Fire Department	2007-2009	Local	A	PA	1,3	High/Low	N/A
EARTHQUAKES	Shelter/House survival supplies and backup power supplies	Village of Rockton	Ongoing	Local	D	PA	1	Medium/Low	N/A
EXTREME HEAT	Designate Cool Zone Shelters	Village of Rockton	2007-2009	Local	D	ES	1	High/Medium	N/A
FLOODING	Prohibit building in the floodplain; Comply with NFIP Building Standards	Village of Rockton	Ongoing	Local	B	PA	1,2	High/Low	New Structures

Village of Roscoe's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury that could be caused by natural hazards.
- Goal 2: Minimize the loss of property
- Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 4: Aid citizens in essential services

Table 61. Village of Roscoe's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Construct an emergency shelter to use to distribute water, food, sanitation products, etc; Use as a cooling center also	Fire Department	2007-2008 (ASAP)	General Funds, State and Federal Funding	A	PA	1,4	High/Medium	N/A
ALL HAZARDS	Improve roads, public water, and sewer to withstand natural hazards	Capital Improvement Committee	ongoing	General Funds and NPPWD	B	SP	4	High/High	New and Existing Structures
DROUGHT	Construct public water system to reduce the number of residents using shallow wells	North Park Public Water District	ongoing	General Funds, State and Federal Funding	A	SP	1,2,4	High/High	N/A
EARTHQUAKE	Increase public awareness by creating earthquake preparedness brochures and flyers and by public outreach	Local Township	2007-2008 (ASAP)	General Funds, State and Federal Funding	C	PI	1,3	Medium/Low	N/A
FLOODING	Continue to participate in the National Flood Insurance Program	FEMA, IDNR	ongoing	General Funds, State and Federal Funding	B	PA	1,2	High/Low	New and Existing Structures
FLOODING	Control Stormwater run off	Developers	ongoing	Developers	B	SP	1,2	High/Medium	N/A
FLOODING	Prevent construction of structures within the floodplain	Floodplain Administrator (Mayor or Village Trustee)	ongoing	General Funds	B	PA	1,2	High/Low	New Structures
SEVERE STORM, SEVERE WINTER STORM, TORNADO	Require all utilities to be burried underground	Utility Companies (Com Ed, AT&T, Verizon, Rock Co. Co-op, cablevision)	ongoing	General Funds, State and Federal Funding	B	PA	1,2	High/High	N/A
SEVERE STORM, TORNADOES	Install sirens in the outer areas of the village	Fire Department, Fire Districts, ESDA	2007-2008	General Funds, Homeland Security Grant	A	PA	1	High/Medium	N/A
SEVERE WINTER STORMS	Create multiple centers for salt and sand to be stored for Municipal trucks to use during Severe Winter Storms	County and Township Highway Department, Department of Transportation	2007-2010	General Funds, State and Federal Funding	B	SP	1,2	High/Medium	New Structures

City of South Beloit's Action Plan and Mitigation Goals:

- Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
- Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
- Goal 3: Reduce physical / structural damages from natural hazards
- Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation

Table 62. City of South Beloit's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Buy a backup generator that will be placed in the Emergency Center at the Fire Station	Fire Department	2010	General Funds	B	PA	1,2	High/Medium	Existing Structures
ALL HAZARDS	Create Emergency Center at Fire Station	Fire Department	2007 - 2010	General Funds and Association Funding	B	ES	1,2	High/Medium	Existing Structures
DROUGHT	Reduce risk to private well users by reducing unnecessary water consumption in the area	Illinois American Water / Community website	As needed based on weather	Customer Billing	D	PA	1,3	High/Low	N/A
DROUGHT	Reduce risk to private well users by having water utility notify local authority of the drought	Utility Company	ongoing	TBD	D	PI	1,3,4	High/Low	N/A
FLOODING	Reduce effects of flooding by clearing creeks of debris	Public Works	1 per year.	Public Works General Funds	B	SP	1,2,3	High/Medium	New and Existing Structures
FLOODING	Develop ordinance to require trestle bridges structural integrity checked for flooding	Public Works / Railroads	2010	Public Works General Funds	B	PA	1,2,3	Medium/Medium	New and Existing Structures
SEVERE STORM/ EXTREME HEAT/ EARTHQUAKE/ SEVERE WINTER STORMS	Alert local area via Media outlets of hazardous weather or conditions	Media	2007	TBD	C	PI	1,2,4	High/Low	N/A
SEVERE STORM/ SEVERE WINTER STORMS/ TORNADOES	Install new alarm systems	Fire Department	2007, 2008	General Funds and Homeland Security Grant	B	PA	1,2	High/Medium	N/A
SEVERE STORM/ TORNADOES/ SEVERE WINTER STORMS	Clear roadways of debris, snow, etc post-hazard	Public Works	As needed based on weather	General Funds	B	ES	1,2	High/High	N/A
TORNADO	Reduce loss of life by	Fire Department Chief	2007 - 2012	FEMA HMGP	D	ES/PA	1,2	High/Medium	Existing Structures

Table 62. City of South Beloit's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	providing local tornado shelters in city buildings								
TORNADO	Make city buildings (i.e. Library, Community Center, Fire Department, Schools, City Hall, etc) compliant with structural codes in order to withstand high winds produced from Tornadoes	Fire Department and City Council	2007 - 2012	FEMA Mitigation Funds	D	PA	1,2,3	High/Medium	New and Existing Structures

Village of Winnebago's Action Plan and Mitigation Goals:

- Goal 1: Minimize the loss of life and injury due to hazards
- Goal 2: Increase community awareness, education, and understanding of natural hazards and mitigation
- Goal 3: Minimize the loss of property and damage due to hazards

Table 63. Village of Winnebago's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-3	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
SEVERE STORMS	Alert local citizens of hazards via the media	Village of Winnebago	As needed based on weather	Local, Media	C	PI	1,2	High/Low	N/A
ALL HAZARDS	Monitor, test, and utilize warning siren system	Village of Winnebago	Yearly	Local	C	PA	1,2	High/Low	Existing Structures
SEVERE STORMS, SEVERE WINTER STORMS, TORNADOES	Clear roadways of debris, snow, etc post-hazard	Public Works, County Highway Department	As needed based on weather	Local, County	B	ES	1	High/High	N/A
ALL HAZARDS	Provide critical services from transportation, health services, law enforcement, etc to aid after a hazard has occurred	Winnebago County	Ongoing	Local, County operating budget, IEMA, FEMA	B	ES	1	High/High	N/A
FLOODING	Encourage floodproofing practices and codes to those structures located near streams or prone flash flooding areas	Village of Winnebago	2007-2012	County, IEMA, FEMA	B	PA/PP	1,3	High/Medium	New and Existing Structures

Winnebago County's Action Plan and Mitigation Goals:

- Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
- Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
- Goal 3: Reduce physical / structural damages from natural hazards
- Goal 4: Minimize the loss of utilities during hazards.
- Goal 5: Increase community awareness, education and understanding of natural hazards and mitigation
- Goal 6: Enhance existing GIS and other technical data
- Goal 7: Strengthen relationships between separate units of government, businesses and the general public

Table 64. Winnebago County's Multi-Jurisdictional Mitigation Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Increase structural resistance from seismic, wind, snow, etc by enforcing building codes	Building and Zoning Department	ongoing	General Funds and Permit Fees	B	PA	3	High/Medium	New and Existing Structures
ALL HAZARDS	Maintain critical avenues of communication	IEMA, IEPA, FEMA, Winnebago County	TBD (when funding is available)	State, Federal, and Local funding	B	PA	4,5	High/Low	N/A
ALL HAZARDS	Disseminate public notification and information on hazards	Telephone and Cell Phone Companies and Media	ongoing	State, Federal, and Local funding	C	PI	1,2,5	High/Low	N/A
ALL HAZARDS	Provide critical services from transportation, health services, law enforcement, and other protective services	Winnebago County Highway Department	ongoing	Annual operating budget, IEMA, and FEMA	B	ES	1,2,4	High/High	N/A
ALL HAZARDS	Maintain and promote ingress and egress routes	Winnebago County Highway Department	ongoing	Annual operating budget, IEMA, and FEMA	B	ES	1,2,5	High/High	N/A
ALL HAZARDS	Conduct an assessment of susceptibility	ESDA, IEMA, and FEMA	ongoing	Annual operating budget	B	PA	1,2,5	High/Medium	New and Existing Structures
ALL HAZARDS	Maintain facilities that optimize survivability and or reduce loss	Winnebago County Highway Department	ongoing	Annual operating budget	B	PA	1,2,4	High/High	Existing Structures
ALL HAZARDS	Protect critical resources and services	Winnebago County Highway Department	ongoing	Annual operating budget	B	PA	1,2,4,7	High/High	N/A
ALL HAZARDS	Develop post-development storm water controls to maximize infiltration	Winnebago County Highway Department and Winnebago County Building and Zoning Department	2008/2009	Minimal operating budget impact	B	SP	1,2,4	High/Medium	N/A
ALL HAZARDS	Continue providing community outreach by	ESDA	ongoing	None	C	PI	5	High/Low	N/A

Table 64. Winnebago County's Multi-Jurisdictional Mitigation Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	reviewing emergency plans for pulbic and private facilities and public speaking events (Emergency Services Director)								
ALL HAZARDS	Host yearly public severe weather training	NWS, Winnebago County ESDA	Yearly	None	C	PI	5	High/Low	N/A
ALL HAZARDS	Operate the Integrated Emergency Management Committee (IEMC) promoting information sharing and relationship building among police, fire, emergency management, public facilities, hospitals, schools, non-profit, and State agencies	ARC, Salvation Army, WC ESDA, Rock River water Reclamation District, North Park Public Water District, all local hospitals, all law enforcement departments within Winnebago County, all fire protection districts and fire departments within Winnebaco County, IEMA, Center for sight and hearing, Winnebago County Health department, Veteran's Administration, Regional Office of Eduction and more	regular meetings	None	B	PI	5	High/Low	N/A
ALL HAZARDS	Coordinate emergency vehicle routes in consideration of snowplow movement, transportation of other personnel (medical, police, communications, emergency servicecs, etc)	Winnebago County Highway Department, WC ESDA	2008	Winnebago County Highway Department, WC ESDA	B	PA	1,2,7	High/Low	N/A
ALL HAZARDS	Install adequate outdoor warning devices to cover all of Winnebago County	Winnebago County (including all cities and villages)	TBD (when funding is available)	State, Federal, and Local funding	B	PA	1,2,5	High/High	N/A
ALL HAZARDS	Promote more stringent building codes and retrofitting of critical facilities	Winnebago County	2008	Winnebago County	B	PA	1,2,3	High/Low	New and Existing Structures
DROUGHT	Maintain adequate water supply thru public information / education	Winnebago County, Public Works	ongoing	TBD	C	PI	1,5	High/Low	N/A

Table 64. Winnebago County's Multi-Jurisdictional Mitigation Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	outreach								
DROUGHT	Recharge groundwater areas by reducing excess water run-off	Winnebago County	ongoing	TBD	D	PA	4	High/Medium	N/A
DROUGHT	Modify storm water detention areas by imporving storage time	Winnebago County, Public Works	ongoing	TBD	D	SP	1,3,4	High/High	Existing Structures
DROUGHT, FLOODING, SEVERE STORMS	Install and operate streamgages for monitoring water levels	Winnebago County ESDA, Winnebago County Sheriff's Office, USGS, Army Corp of Engineers, NWS, Commonwealth Edison	Installed 2002, ongoing	Commonwealth Edison, Winnebago County Sheriff's Office, USGS, Army Corp of Engineers, Winnebago County Highway Department, State Grants	B	SP	1,2,4,5,6	High/Medium	New Structures
FLOODING	Maintain drainage systems with isolated maintenance programs	Rock River Water Reclamation	ongoing	TBD	B	SP	1,2	High/Medium	Existing Structures
FLOODING	Continue to participate in the National Flood Insurance Program	Rock River Water Reclamation, FEMA, IDNR	ongoing	TBD	B	PA	1,2,3	High/Low	N/A
FLOODING	Prevent/strictly control construction of structures within the floodplain; comply with Winnebago County Surface Water Management Ordinance	Couty Highway Department, Building/Zoning Departments, Health Department, Soil and Water Conservation District	ongoing	Highway Funds, General Funds	B	PA	1,2,3	High/Low	New Structures
FLOODING	Implement and further expand maintenance programs for drainage systems	Winnebago County	ongoing	TBD	B	SP	1,2,3	High/Medium	Existing Structures
FLOODING	Improve capacity of drainage systems county-wide	Winnebago County	TBD (when funding is available)	TBD	B	SP	1,2,3	High/High	Existing Structures
FLOODING	Construct or improve storm water drainage and management facilities	IEMA, IEPA, FEMA, Winnebago County Highway Dept	TBD (when funding is available)	State, Federal, and Local funding	B	SP	1,3,4	High/High	New and Existing Structures
FLOODING	Floodproof homes in the floodplains	WC ESDA, FEMA	TBD (when funding is available)	FEMA Grants, Federal, State and Local Grants	B	PP	1,2,3	High/High	New and Existing Structures
FLOODING	Promote NFIP to businesses and homeowners in Winnebago County	WC ESDA	ongoing	None	C	PA	1,2,3	High/Low	New and Existing Structures
FLOODING and SEVERE STORMS	Continue to maintain the two sandbaggers	ESDA, Winnebago County Sheriff's office,	ongoing	Winnebago County	B	PA	1,2,3	High/Medium	N/A

Table 64. Winnebago County's Multi-Jurisdictional Mitigation Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	and sandbagging equipment to keep on hand for emergency use	Harlem Township							
SEVERE STORMS, SEVERE WINTER STORMS, TORNADOES	Utilize Amateur Radio Emergency Services (ARES) and storm spotters	Winnebago County ESDA, ARES	ongoing	None	B	PA	1,2,5	High/Low	N/A

4.6. Local Mitigation Strategy and Capabilities Assessment

This plan includes specific actions for each jurisdiction in Winnebago County. These actions are based on goals developed to address the risks identified throughout the region. It is the intent of each jurisdiction to implement these actions using practices that are cost-effective, environmentally sound, and technically feasible.

Following the Plan's adoption, the Planning Committee will continue to work with the Winnebago County government, departments and other regional organizations to implement mitigation strategies on a regional basis where feasible. While the commitment to implementing this strategy is strong, the potential for success is directly linked to each jurisdiction's capability.

The purpose of the capability assessment is to identify the potential hazard mitigation opportunities available to each jurisdiction that may already exist as part of each jurisdiction's daily operations (e.g. code enforcement, operations, maintenance, etc).

This assessment will highlight the positive measures already in place in the jurisdiction as well as identify weaknesses that could increase vulnerability in a jurisdiction. The capability assessment serves as the foundation for an effective hazard mitigation strategy. By establishing goals and objectives for jurisdictions to pursue under the Plan, it ensures that the goals and objectives that are decided upon are realistically attainable given local resources.

The following summary and assessment is based upon a questionnaire sent to each jurisdiction's planning representative (i.e. Planning Committee*)*. This questionnaire asked committee members to distinguish which plans and ordinances were currently in place within their jurisdictions and what resources they had access to that would aid in mitigation actions and hazard preparedness. See Appendix I for the complete table containing available resources from each jurisdiction

4.6.1. Local Mitigation Practices

The following defines local practices already in place throughout the county's jurisdictions that encourage or promote mitigation activities. These practices reside within existing polices, ordinances, programs, and other planning efforts.

Mitigation Management Policies. The Emergency Operations Plan (EOP) provides for an integrated countywide emergency preparedness and response plan, utilizing public, nonprofit, and private resources. Winnebago County maintains an emergency operations plan. The plan was a source for hazard identification and emergency operation procedure. Procedure includes roles and responsibilities of persons/departments in charge of dispatching help during a natural hazard, rules that are followed, evacuation procedures dispersed by the transportation officer to be followed, etc. The EOP proved to be a valuable source of information for both risk assessment and mitigation for this hazard mitigation plan.

Existing Plans. In general, the County's policies encourage cooperation and coordination within its jurisdictional agencies, as well as cooperation, including mutual aid compacts, between neighboring counties and municipalities within the region. The EOP provides for an integrated countywide emergency preparedness and response plan, utilizing public, nonprofit, and private resources.

Mitigation Programs. The main mitigation programs are the county's floodplain management regulations and participation in and administration of the National Flood Insurance Program. Additional programs include:

a. The County's Floodplain Regulations which are aimed at restricting any new development in the floodplain. The current ordinance requires one foot of additional freeboard for new structures and requires an increase, if necessary, to that elevation when structures are significantly reconstructed within the floodplain. The Jurisdictions within the county would like to participate in floodplain property acquisition, specifically the City of Rockford, funded through FEMA's Hazard Mitigation Program.

b. The County's Surface Water Management Ordinance addresses flood potential by (A) strictly controlling new developments and substantial improvements in flood prone areas in accordance with and beyond FEMA minimum floodplain regulations; (i.e. Flood safe building elevation is a minimum of 1 foot above BFE; Establishing safe base flood passageways for areas down to 10-acres tributary—significantly augmenting DFIRMs with 640 +/- acres tributary) and (B) reducing increased flood peak flows with post-development, 100 year max allowable release rate of 0.2 cubic feet per second per developed acre.

c. Winnebago County severe weather warnings will be disseminated by activation of emergency radio warning systems and subsequent rebroadcast by broadcast stations and cable television system.

d. Winnebago County geographic Information System (WinGIS) capabilities have facilitated the development of limited critical facilities layers and points of interest data which allows the county and its jurisdictions to map the most important features in each of their communities and mitigate those structures based on risk and need.

4.6.2. Available Funding Resources

There are several sources of funding for both pre - and post-disaster hazard mitigation policies and projects. While all mitigation techniques will save money by avoiding different types of losses, the implementation of mitigation efforts can be costly and well beyond the local jurisdiction or county's capacity to fund the mitigation activity. There are existing federal and state funding programs that can be utilized for funding assistance. The following is a list of some sources of funding presently available. This list is not comprehensive, as new programs can be developed or existing programs can be eliminated or modified over time.

a. Federal Sources:

1) *Pre-disaster Mitigation Program: Federal Emergency Management Agency (FEMA)*: Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. The Pre-Disaster Mitigation (PDM) Program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program, and reduce injuries, loss of life, and damage and destruction of property.

2) *Emergency Management Performance Grant*: *Federal Emergency Management Agency (FEMA):* Encourages the development of comprehensive emergency management, including for terrorism consequence management, at the State and local level and to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities. Funding is provided to the States, which can be used to educate people and protect lives and structures from natural and technological hazards.

3) *Public Assistance Program Agency: Federal Emergency management Agency (FEMA):* To provide supplemental assistance to States, local governments, and certain private non-profit organizations to alleviate sufferings and hardship resulting from major disasters or emergencies declared by the President. These grants allow State and local units of government to respond to disasters, recover from their impact, and mitigate impact from future disasters.

4) *Flood Mitigation Assistance Program*: *Federal Emergency management Agency (FEMA):* FEMA's Flood Mitigation Assistance Program (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). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the NFIP. FMA is a pre-disaster grant program, and is made available to states on an annual basis. This funding is exclusively available for mitigation planning and implementation of mitigation measures.

   Criteria: Community must be a participant in NFIP, the project must be cost effective, beneficial to the NFIP fund, and technically feasible. The project must conform with the minimum standards of the NFIP Floodplain Management Regulations, the applicant's Flood Mitigation Plan, and all applicable laws and regulations.

5) *Hazard Mitigation Grant Program: Federal Emergency Management Agency (FEMA):* The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The

   HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

   Criteria: Project must conform with the State's Hazard Mitigation Plan, provide a beneficial impact on the disaster area, meet environmental requirements, solve a problem independently, and be cost-effective.

6) *Flood Control Works/Emergency Rehabilitation Agency: Department of Defense, US Army Corp of Engineers*: To assist in the repair and restoration of public works damaged by flood, extraordinary wind, wave, or water action. The Corps provides public works and engineering

support to supplement State and local efforts toward the effective and immediate response to a natural disaster

7) *National Earthquakes Hazards Reduction Program: Federal Emergency Management Agency*: The NEHRP's premise is that while earthquakes may be inevitable, earthquake-related damages are not. Activities of the program include basic and applied research; technology development and transfer; and training, education and advocacy for seismic risk reduction measures. FEMA administers a program of grants and technical assistance to States to increase awareness of earthquake hazards, foster plans, and implement mitigation actions to reduce seismic vulnerability.

8) *Community Development Block Grants: US Department of Housing and Urban Development*: The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low-and moderate-income people. The CDBG program also provides grants for post disaster hazard mitigation and recovery following a Presidential disaster declaration.

   Criteria: CBDG eligible communities (generally communities with under 50,000 population and counties under 200,000 population) located within a Presidential disaster declaration area.

9) *Sustainable Development Assistance: Department of Energy*: The team works with communities to help them define and implement sustainable development strategies as part of their comprehensive community planning efforts. The team provides technical assistance to disaster – affected communities as they plan for long-term recovery by introducing a wide array of environmental technologies and sustainable redevelopment planning practices.

10) *Emergency Watershed Protection: Department of Agriculture*: Natural Resources Conservation Service *(NRCS)*: The Emergency Watershed Protection Program (EWP) provides financial assistance to sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a disaster. Activities include providing financial and technical assistance to remove debris from streams, protect destabilized stream banks, and the purchase of flood plain easements. The program is designed for installation of recovery measures. It is not necessary for a national emergency to be declared to be eligible for assistance.

11) *Transportation Emergency Relief Program: Department of Transportation, Federal Highway Administration*: To provide aid for repair of Federal-aid roads. The funds can be used to repair federal-aid roads by using new technologies that improve the quality and lifespan of the roads.

b. State Funding:

1) *Section 208 Snagging and Clearing for Flood Control: United States Corps of Engineers*: Corps of Engineers designs and constructs the project. Each project must be engineering feasible, complete within itself, and economically justified. The nonfederal sponsor must provide all lands, easements, and rights of way. Non-Federal sponsor pays all project costs in excess of the Federal limit of $500,000. Sponsor agrees to maintain the project.

2) *Volunteer Labor Force (G): Illinois Department of Corrections*: Prisoners can be used to sandbag, construct levees and flood fight. Prisoners are also occasionally used to clean streams of brush and debris or clean up following a flood disaster.

3) *Community Development Assistance Program (Community Development BlockGrant: Illinois Department of Commerce and Community Affairs:* Eligible projects must include activities that improve community welfare, specifically in moderate or low-income areas. Conservation related projects can possibly include the acquisition of real property (e.g., flood-prone areas), construction of water or sewer facilities, and initiatives for energy conservation. Funding competition is intense. Application deadlines vary; no match required.

4) *Hazard Mitigation Assistance Program: IEMA Agency:* Governments must be enrolled and in good standing with the NFIP. Eligible initiatives are eligible for projects that include acquisition of insured structures and underlying real property for open space use. Provides up to 75% of project costs, 25% match required.

5) *Greenways and Trails Planning Assistance Program: Illinois Department of Natural Resources*: IDNR provides community-wide or individual assistance and training to communities trying to regulate floodplain development activities and reduce existing flood problems. Can provide communities with training manuals, model floodplain and storm water ordinances, technical assistance, risk assessment, and floodplain mapping.

   - Eligible units of government include counties and communities 10,000
   - $20,000 maximum awarded, 50% in-kind contribution required
   - Must follow a planning process

6) *Open Space Lands Acquisition and Development (OSLAD) Program and Open Lands Trust Program: Illinois Department of Natural Resources*: Eligible products include money for acquisition and development of public parks for passive recreation/open spaces. Application deadlines vary. Conservation easement required with both programs. Funding is reimbursable up to 50% of project costs, reimbursable up to $2 million for the Trust Grant.

There are several sources of available funding for hazard mitigation projects. Those identified here, while they are significant, do not comprise all potential sources of funding. It should be noted that new programs can become available while existing programs can be modified or dropped. Many funds available are leveraged with "local" matching funds at various contribution percentages. Diligence in keeping abreast of changes in funding opportunities will be necessary to institute hazard mitigation projects that take advantage of non-local funds.

Winnebago County and its jurisdictions are well positioned to perform successful implementation of the activities identified within the Plan. As a result, the communities are better prepared to achieve their identified goals for mitigating local risk to natural hazards throughout the region.

5. Plan Maintenance

Plan Maintenance is the process in which the Plan will be monitored, evaluated, and updated within a five-year cycle. When updated, the plan will be reviewed, revised, and resubmitted to the State/IEMA within five years of the plan for approval by FEMA Region V. As appropriate, the plan will also be evaluated after a disaster, or after unexpected changes in land use or demographics in or near hazard areas. The Planning Committee also will be kept apprised of a change in federal regulations, programs and policies, such as a change in the allocation of FEMA's funding for mitigation grant programs. These evaluations will be addressed in the annual progress report for the plan and may affect the Action Plan for Mitigation goals and activities.

5.1. Monitoring, Evaluating, and Updating the Plan

Monitoring. Members of the Planning Committee and Advisory Group (i.e. the Planning Team) will continue to monitor the status and track the progress of the plan elements on an annual basis. The Planning Committee will oversee the progress made on the implementation of the identified actions and update the plan as needed to reflect changing conditions. The Planning Committee will meet annually to evaluate plan progress and recommend updates.

Evaluating. Evaluation of the plan will not only include checking the implementation status of mitigation actions, but also assessing their degree of effectiveness and assessing whether other natural hazards need to be addressed and added to the plan (man-made hazards). This will be accomplished by reviewing the benefits (or avoided losses) of the mitigation activities that were in place within each jurisdiction and county. These will be compared to the goals the Plan has set to achieve. The team will also evaluate whether mitigation actions need to be discontinued or modified in light of new developments or changes within the community. Public comment on the plan and achievement of goals and objectives will also be solicited annually during the evaluation by the committee. The progress will be documented by the Planning Committee and submitted to the Winnebago County for review who will then update the Winnebago County website with any review updates.

Updating. As required by part 201.6(c)(4)(i) of the Local Hazard Mitigation Plan Review Crosswalk, this plan will be updated within 5 years of the date of the Federal Emergency Management Agency's (FEMA) approval of the plan. The plan may be updated earlier, at the discretion of the Planning Committee and its jurisdictions. Also, the Committee's ability to

update the mitigation process by adding new data and incorporating it into the mitigation plan, will allow for the efficient use of available resources, staff, and programs. Any changes in the Plan will be documented and appended in a section titled “Amendments”. The Action Plan will be maintained as an Appendix so it can remain a living document.

5.2. Implementation Through Existing Programs

The Local Capabilities Assessment Matrix and the Local Code Summary in Appendix I demonstrate the local planning mechanisms available for incorporating the requirements of the hazard mitigation plan. The assessments will be updated as needed, during the annual review and standard enforcement of the existing authorities, programs, and mitigation actions.

The identified action projects address reducing the effects of hazards on new buildings and infrastructure as well as existing buildings and infrastructure. Activities also incorporate mitigation activities into other planning mechanisms and recommends mitigation projects that can be integrated into Master Plans, Flood Mitigation Plans, Capital Improvement Plans, Land-use Plans, Emergency Management Plans, Zoning Ordinances, Building Codes, and Post-Disaster Mitigation Policies and Procedures where appropriate. In addition, projects will be implemented through existing or ongoing programs.

5.3. Continued Public Participation

In order to have continued public support of the mitigation process, it is important that the public be involved not only in the preparation of the initial plan, but also in any modifications or updates to the plan. To ensure that the public support is maintained, the following actions may be taken by the Planning Team or Project Administrator:

- Develop informational mailings to be distributed to the public about mitigation efforts in the County and updates made by the Planning Team.
- Develop mitigation flyers or mailings that contain mitigation activities and actions that promote reducing damages and risks of natural hazards.
- Develop a survey following a Presidential, Emergency, or State Declaration to solicit public input about current or possible future mitigation activities, and place it on the County website.
- Hold a public meeting prior to plan update/re-adoption every 5 years, to allow for public comment on the plan.

6. Additional State Requirements

The Planning Team has reviewed the additional requirements for local plans as identified within the Illinois Natural Hazards Mitigation Plan. The State plan requests that local plans include the following tables and worksheets for each jurisdiction represented by the plan:

a. Worksheet 3A. Critical Facilities, Structures, and Population Information.

b. Potential Structure Losses for Floods.

c. Potential Structure Losses for Earthquakes.

The tables provided below satisfy Illinois requirements and may be used to augment future natural hazard planning practices and risk mitigation approaches

Worksheet 3a: Village of Cherry Valley– Inventory Assets

Table 65.. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	972	972	100%	$141,050,760	$141,050,760	100%	1128	1128	100%
Commercial	143	143	100%	$130,483,821	$130,483,821	100%	1044	1044	100%
Industrial	6	6	100%	$1,718,316	$1,718,316	100%	14	14	100%
Religious	2	2	100%	N/A	N/A	0%	0	0	0%
Education	1	1	100%	$555,000	$555,000	100%	0	0	0%
Government	1	1	100%	$2,886,000	$2,886,000	100%	0	0	0%
Utilities	1	1	100%	N/A	N/A	0%	0	0	0%
Agricultural	23	23	100%	$698,313	$698,313	100%	6	6	100%
TOTAL:	**1149**	**1149**	**100%**	**$273,951,210**	**$273,951,210**	**100%**	**2192**	**2192**	**100%**

Table 66.. Floods

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	972	98	10%	$141,050,760	$11,663,739	8%	1128	250	22%
Commercial	143	14	10%	$130,483,821	$13,919,625	11%	1044	0	0%
Industrial	6	0	0%	$1,718,316	$0	0%	14	0	0%
Religious	2	0	0%	$0	$0	0%	0	0	0%
Education	1	0	0%	$555,000	$0	0%	0	0	0%
Government	1	0	0%	$2,886,000	$0	0%	0	0	0%
Utilities	1	1	100%	N/A	$0	0%	0	0	0%
Agricultural	23	7	30%	$698,313	$698,313	100%	6	18	100%
TOTAL:	**1149**	**120**	**10%**	**$273,951,210**	**$26,281,677**	**10%**	**2192**	**268**	**12%**

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Durand – Inventory Assets

Table 67. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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 Hazar d Area	% in Hazard Area
Residential	516	516	100%	$47,052,207	$47,052,207	100%	848	848	100%
Commercial	75	75	100%	$11,910,357	$11,910,357	100%	215	215	100%
Industrial	16	16	100%	$800,274	$800,274	100%	14	14	100%
Religiouis	2	2	100%	N.A	N/A	0%	0	0	0%
Education	3	3	100%	$1,665,000	$1,665,000	100%	0	0	0%
Government	5	5	100%	$1,332,000	$1,332,000	100%	0	0	0%
Utilities	1	1	100%	$73,926,000	$73,926,000	100%	0	0	0%
Agricultural	6	6	100%	$205,686	$205,686	100%	4	4	100%
TOTAL:	**624**	**624**	100%	**$136,891,524**	**$136,891,524**	100%	**1081**	**1081**	100%

Table 68. Floods

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	516	31	6%	$47,052,207	$4,063,707	9%	848	76	9%
Commercial	75	4	5%	$11,910,357	$1,678,191	14%	215	0	0%
Industrial	16	0	0%	$800,274	$0	0%	14	0	0%
Religiouis	2	0	0%	$0	$0	0%	0	0	0%
Education	3	0	0%	$1,665,000	$0	0%	0	0	0%
Government	5	0	0%	$1,332,000	$0	0%	0	0	0%
Utilities	1	0	0%	$73,926,000	$0	0%	0	0	0%
Agricultural	6	3	50%	$205,686	$95,658	47%	4	7	100%
TOTAL:	**624**	**38**	6%	**$136,891,524**	**$5,837,556**	4%	**1081**	**83**	8%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: City of Loves Park– Inventory Assets

Table 69. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	7908	7908	100%	$836,535,477	$836,535,477	100%	1431	1431	100%
Commercial	709	709	100%	$248,235,300	$248,235,300	100%	425	425	100%
Industrial	360	360	100%	$109,563,138	$109,563,138	100%	187	187	100%
Religious	14	14	100%	N/A	N/A	0%	0	0	0%
Education	9	9	100%	$4,995,000	$4,995,000	100%	0	0	0%
Government	6	6	100%	$2,886,000	$2,886,000	100%	0	0	0%
Utilities	4	4	100%	$333,000	$333,000	100%	0	0	0%
Agricultural	30	30	100%	$418,779	$418,779	100%	1	1	100%
TOTAL:	**9040**	**9040**	100%	**$1,202,966,694**	**$1,202,966,694**	100%	**2044**	**2044**	100%

Table 70. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	7908	489	6%	$836,535,477	$48,833,670	6%	1431	1193	83%
Commercial	709	92	13%	$248,235,300	$34,406,595	14%	425	0	0%
Industrial	360	50	14%	$109,563,138	$25,666,719	23%	187	0	0%
Religious	14	0	0%	N/A	$0	0%	0	0	0%
Education	9	0	0%	$4,995,000	$0	0%	0	0	0%
Government	6	2	33%	$2,886,000	$2,220,000	77%	0	0	0%
Utilities	4	0	0%	$333,000	$0	0%	0	0	0%
Agricultural	30	3	10%	$418,779	$95,625	23%	1	7	100%
TOTAL:	**9040**	**636**	7%	**$1,202,966,694**	**$111,222,609**	9%	**2044**	**1200**	59%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Machesney Park

Table 71. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	8908	8908	100%	$902,080,896	$902,080,896	100%	17199	17199	100%
Commercial	226	226	100%	$115,219,083	$115,219,083	100%	2197	2197	100%
Industrial	212	212	100%	$70,753,386	$70,753,386	100%	1349	1349	100%
Religious	13	13	100%	N/A	N/A	0%	0	0	0%
Education	8	8	100%	$4,440,000	$4,440,000	100%	0	0	0%
Government	1	1	100%	$666,000	$666,000	100%	0	0	0%
Utilities	0	0	0%	$0	$0	0%	0	0	0%
Agricultural	30	30	100%	$750,198	$750,198	100%	14	14	100%
TOTAL:	**9398**	**9398**	100%	**$1,093,909,563**	**$1,093,909,563**	100%	**20759**	**20759**	100%

Table 72. Floods

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	8908	1239	14%	$902,080,896	$151,956,819	17%	17199	3321	19%
Commercial	226	40	18%	$115,219,083	$40,698,636	35%	2197	0	0%
Industrial	212	15	7%	$70,753,386	$2,591,901	4%	1349	0	0%
Religious	13	0	0%	N/A	$0	0%	0	0	0%
Education	8	1	13%	$4,440,000	$555,000	13%	0	0	0%
Government	1	0	0%	$666,000	$0	0%	0	0	0%
Utilities	0	0	0%	$0	$0	0%	0	0	0%
Agricultural	30	12	40%	$750,198	$374,508	50%	14	14	100%
TOTAL:	**9398**	**1307**	14%	**$1,093,909,563**	**$196,176,864**	18%	**20759**	**3335**	16%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of New Millford– Inventory Assets

Table 73. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	483	483	100%	$19,059,903	$19,059,903	100%	475	475	100%
Commercial	14	14	100%	$2,552,916	$2,552,916	100%	64	64	100%
Industrial	1	1	100%	$73,671	$73,671	100%	2	2	100%
Religious	1	1	100%	N/A	N/A	0%	0	0	0%
Education	0	0	0%	$0	$0	0%	0	0	0%
Government	0	0	0%	$0	$0	0%	0	0	0%
Utilities	0	0	0%	$0	$0	0%	0	0	0%
Agricultural	7	7	100%	$0	$0	100%	0	0	100%
TOTAL:	**506**	**506**	100%	**$21,686,490**	**$21,686,490**	100%	**541**	**541**	100%

Table 74. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	483	14	3%	$19,059,903	$1,317,444	7%	475	32	7%
Commercial	14	2	14%	$2,552,916	$1,004,145	39%	64	0	0%
Industrial	1	0	0%	$73,671	$0	0%	2	0	0%
Religious	1	0	0%	$0	$0	0%	0	0	0%
Education	0	0	0%	$0	$0	0%	0	0	0%
Government	0	0	0%	$0	$0	0%	0	0	0%
Utilities	0	0	0%	$0	$0	0%	0	0	0%
Agricultural	7	0	0%	$0	$0	0%	0	0	0%
TOTAL:	**506**	**16**	3%	**$21,686,490**	**$2,321,589**	11%	**541**	**32**	6%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Pecatonica– Inventory Assets

Table 75. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	866	866	100%	$83,633,883	$83,633,883	100%	1687	1687	100%
Commercial	82	82	100%	$9,624,357	$9,624,357	100%	194	194	100%
Industrial	37	37	100%	$5,721,564	$5,721,564	100%	115	115	100%
Religious	1	1	100%	N/A	N/A	0%	0	0	0%
Education	0	0	100%	$0	$0	0%	0	0	0%
Government	2	2	100%	$2,220,000	$2,220,000	100%	0	0	0%
Utilities	2	2	100%	$147,852,000	$147,852,000	100%	0	0	0%
Agricultural	11	11	100%	$9,768	$9,768	100%	0	0	100%
TOTAL:	**1001**	**1001**	100%	**$249,061,572**	**$249,061,572**	100%	**1996**	**1996**	100%

Table 76. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	866	27	3%	$83,633,883	$2,145,438	3%	1687	69	4%
Commercial	82	9	11%	$9,624,357	$2,373,588	25%	194	0	0%
Industrial	37	4	11%	$5,721,564	$226,506	4%	115	0	0%
Religious	1	0	0%	N/A	$0	0%	0	0	0%
Education	0	0	0%	$0	$0	0%	0	0	0%
Government	2	0	0%	$2,220,000	$0	0%	0	0	0%
Utilities	2	0	0%	$147,852,000	$0	0%	0	0	0%
Agricultural	11	2	18%	$9,768	$0	0%	0	5	0%
TOTAL:	**1001**	**42**	4%	**$249,061,572**	**$4,745,532**	2%	**1996**	**74**	4%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: City of Rockford – Inventory Assets

Table 77. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	48729	48729	100%	$4,514,029,449	$4,514,029,449	100%	113252	113252	100%
Commercial	3742	3742	100%	$1,423,605,519	$1,423,605,519	100%	35717	35717	100%
Industrial	1685	1685	100%	$545,643,666	$545,643,666	100%	1145	1145	100%
Religious	252	252	100%	N/A	N/A	0%	0	0	0%
Education	74	74	100%	$47,175,000	$47,175,000	100%	0	0	0%
Government	5	5	100%	$76,590,000	$76,590,000	100%	0	0	0%
Utilities	17	17	100%	$467,310,000	$467,310,000	100%	0	0	0%
Agricultural	97	97	100%	$63,592	$63,592	100%	2	2	100%
TOTAL:	**54601**	**54601**	100%	**$7,074,417,226**	**$7,074,417,226**	100%	**150116**	**150116**	**100%**

Table 78. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	48729	1369	3%	$4,514,029,449	$156,350,088	3%	113252	3491	3%
Commercial	3742	246	7%	$1,423,605,519	$123,448,788	9%	35717	0	0%
Industrial	1685	155	9%	$545,643,666	$64,672,281	12%	1145	0	0%
Religious	252	1	0%	N/A	$0	0%	0	0	0%
Education	74	1	1%	$47,175,000	$1,665,000	4%	0	0	0%
Government	5	0	0%	$76,590,000	$0	0%	0	0	0%
Utilities	17	4	24%	$467,310,000	$147,852,000	32%	0	0	0%
Agricultural	97	34	35%	$63,592	$0	0%	2	84	100%
TOTAL:	**54601**	**1810**	3%	**$7,074,417,226**	**$493,988,157**	7%	**150116**	**3575**	2%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Rockton – Inventory Assets

Table 79. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	2399	2399	100%	$337,545,249	$337,545,249	100%	4821	4821	100%
Commercial	119	119	100%	$27,207,501	$27,207,501	100%	389	389	100%
Industrial	16	16	100%	$5,787,564	$5,787,564	100%	83	83	100%
Religious	7	7	100%	N/A	N/A	0%	0	0	100%
Education	4	4	100%	$2,220,000	$2,220,000	100%	0	0	100%
Government	2	2	100%	$2,220,000	$2,220,000	100%	0	0	100%
Utilities	3	3	100%	$74,037,000	$74,037,000	100%	0	0	100%
Agricultural	3	3	100%	$264,564	$264,564	100%	4	4	100%
TOTAL:	**2553**	**2553**	100%			100%	**5297**	**5297**	100%

Table 80. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	2399	68	3%	$337,545,249	$12,017,043	4%	4821	173	4%
Commercial	119	18	15%	$27,207,501	$3,547,173	13%	389	0	0%
Industrial	16	2	13%	$5,787,564	$1,388,610	24%	83	0	0%
Religious	7	0	0%	N/A	N/A	0%	0	0	0%
Education	4	0	0%	$0	$0	0%	0	0	0%
Government	2	0	0%	$0	$0	0%	0	0	0%
Utilities	3	2	67%	$147,852,000	$147,852,000	100%	0	0	0%
Agricultural	3	2	67%	$264,564	$264,564	100%	4	5	100%
TOTAL:	**2553**	**92**	4%	**$518,656,878**	**$165,069,390**	32%	**5297**	**178**	3%

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Roscoe– Inventory Assets

Table 81. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	3381	3381	100%	$404,617,726	$404,617,726	100%	5006	5006	100%
Commercial	175	175	100%	$80,914,113	$80,914,113	100%	1001	1001	100%
Industrial	79	79	100%	$18,280,746	$18,280,746	100%	226	226	100%
Religious	10	10	100%	N/A	N/A	100%	0	0	100%
Education	1	1	100%	$1,665,000	$1,665,000	100%	0	0	100%
Government	2	2	100%	$2,220,000	$2,220,000	100%	0	0	100%
Utilities	1	1	100%	N/A	N/A	100%	0	0	100%
Agricultural	58	58	100%	$906,657	$906,657	100%	11	11	100%
TOTAL:	**3707**	**3707**	**100%**	**$508,604,242**	**$508,604,242**	**100%**	**6244**	**6244**	**100%**

Table 82. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	3381	281	8%	$404,617,726	$45,446,514	11%	5006	717	14%
Commercial	175	22	13%	$80,914,113	$7,738,445	10%	1001	0	0%
Industrial	79	18	23%	$18,280,746	$1,879,953	10%	226	0	0%
Religious	10	0	0%	N/A	N/A	0%	0	0	0%
Education	1	0	0%	$1,665,000	$0	0%	0	0	0%
Government	2	0	0%	$2,220,000	$0	0%	0	0	0%
Utilities	1	1	100%	N/A	N/A	0%	0	0	0%
Agricultural	58	35	60%	$906,657	$652,611	72%	11	99	100%
TOTAL:	**3707**	**357**	**10%**	**$508,604,242**	**$55,717,523**	**11%**	**6244**	**816**	**13%**

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: City of South Beloit – Inventory Assets

Table 83. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	2808	2808	100%	$213,349,986	$213,349,986	100%	3765	3765	100%
Commercial	260	260	100%	$49,410,672	$49,410,672	100%	872	872	100%
Industrial	146	146	100%	$42,830,274	$42,830,274	100%	756	756	100%
Religious	7	7	100%	N/A	N/A	100%	0	0	100%
Education	6	6	100%	$3,330,000	$3,330,000	100%	0	0	100%
Government	3	3	100%	$2,886,000	$2,886,000	100%	0	0	100%
Utilities	2	2	100%	$74,037,000	$74,037,000	100%	0	0	100%
Agricultural	22	22	100%	$217,614	$217,614	100%	4	4	100%
TOTAL:	**3254**	**3254**	**100%**	**$386,061,546**	**$386,061,546**	**100%**	**5397**	**5397**	**100%**

Table 84. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	2808	364	13%	$213,349,986	$16,219,849	8%	3765	928	25%
Commercial	260	143	55%	$49,410,672	$16,256,832	33%	872	0	0%
Industrial	146	94	64%	$42,830,274	$19,120,242	45%	756	0	0%
Religious	7	0	0%	N/A	N/A	0%	0	0	0%
Education	6	1	17%	$3,330,000	$555,000	17%	0	0	0%
Government	3	3	100%	$2,886,000	$2,886,000	100%	0	0	0%
Utilities	2	1	50%	$74,037,000	$111,000	0%	0	0	0%
Agricultural	22	2	9%	$217,614	$28,884	13%	4	5	100%
TOTAL:	**3254**	**608**	**19%**	**$386,061,546**	**$55,177,807**	**14%**	**5397**	**933**	**17%**

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Village of Winnebago – Inventory Assets

Table 85. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	1037	1037	100%	$120,753,261	$120,753,261	100%	2728	2728	100%
Commercial	63	63	100%	$7,627,575	$7,627,575	100%	172	172	100%
Industrial	6	6	100%	$2,214,666	$2,214,666	100%	50	50	100%
Religious	3	3	100%	N/A	N/A	0%	0	0	0%
Education	4	4	100%	$2,220,000	$2,220,000	100%	0	0	0%
Government	1	1	100%	$1,554,000	$1,554,000	100%	0	0	0%
Utilities	1	1	100%	$73,926,000	$73,926,000	100%	0	0	0%
Agricultural	13	13	100%	$362,361	$362,361	100%	8	8	100%
TOTAL:	**1128**	**1128**	**100%**	**$208,657,863**	**$208,657,863**	**100%**	**2958**	**2958**	**100%**

Table 86. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	1037	0	0%	$120,753,261	0	0%	2728	0	0%
Commercial	63	0	0%	$7,627,575	0	0%	172	0	0%
Industrial	6	0	0%	$2,214,666	0	0%	50	0	0%
Religious	3	0	0%	N/A	0	0%	0	0	0%
Education	4	0	0%	$2,220,000	0	0%	0	0	0%
Government	1	0	0%	$1,554,000	0	0%	0	0	0%
Utilities	1	0	0%	$73,926,000	0	0%	0	0	0%
Agricultural	13	0	0%	$362,361	0	0%	8	0	0%
TOTAL:	**1128**	**0**	**0%**	**$208,657,863**	**0**	**0%**	**2958**	**0**	**0%**

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Worksheet 3a: Winnebago County – Inventory Assets

Table 87. Drought, Earthquake, Extreme Heat, Severe Storms, Severe Winter Storms and Tornadoes

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	28072	28072	100%	$3,439,940,415	$3,439,940,415	100%	70283	70283	100%
Commercial	617	617	100%	$182,834,949	$182,834,949	100%	3736	3736	100%
Industrial	299	299	100%	$100,824,627	$100,824,627	100%	2060	2060	100%
Religious	77	77	100%	N/A	N/A	0%	0	0	0%
Education	15	15	100%	$8,325,000	$8,325,000	100%	0	0	0%
Government	4	4	100%	$3,552,000	$3,552,000	100%	0	0	0%
Utilities	16	16	100%	$3,552,001,000	$3,552,001,000	100%	0	0	0%
Agricultural	4521	4521	100%	$181,874,478	$181,874,478	100%	3716	3716	100%
TOTAL:	**33621**	**33621**	**100%**	**$7,469,352,469**	**$7,469,352,469**	100%	**79795**	**79795**	**100%**

Table 88. Floods

Type of Structure (Occupancy Class)	Number of Structures			Value of Structures			Number of People		
	# in Community or State	# in Hazard Area	% in Hazar d Area	$ in Community or State	$ in Hazard Area	% in Hazard Area	# in Community or State	# in Hazard Area	% in Hazard Area
Residential	28072	2660	9%	$3,439,940,415	$349,296,618	10%	70283	6783	10%
Commercial	617	104	17%	$182,834,949	$21,976,467	12%	3736	0	0%
Industrial	299	64	21%	$100,824,627	$19,522,755	19%	2060	0	0%
Religious	77	0	0%	N/A	$0	0%	0	0	0%
Education	15	0	0%	$8,325,000	$0	0%	0	0	0%
Government	4	0	0%	$3,552,000	$0	0%	0	0	0%
Utilities	16	3	19%	$3,552,001,000	N/A	N/A	0	0	0%
Agricultural	4521	1407	31%	$181,874,478	$50,926,224	28%	3716	3560	96%
TOTAL:	**33621**	**4238**	**13%**	**$7,469,352,469**	**$441,722,064**	6%	**79795**	**10343**	**13%**

1. Do you know where your greatest damages may occur in your hazard areas? YES
2. Do you know whether your critical facilities will be operational after a hazard event? NO
3. Is there enough data to determine which assets are subject to the greatest potential damages? NO
4. Is there enough data to determine whether significant elements of the community are vulnerable to potential hazards? YES
5. Is there enough data to determine whether certain areas of historic, environmental, political or cultural significance are vulnerable to potential hazards? YES
6. Is there concern about a particular hazard because of its severity, repetitiveness, or likelihood of occurrence? YES
7. Is additional data needed to justify the expenditure of community or state funds for mitigation initiatives? YES

Potential Structure Losses for Floods Worksheet:

Table 89. Potential Structure Losses for Floods

Jurisdiction	County	Estimated # of People	% of Structures in Floodplain	# 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)
Village of Cherry Valley	Winnebago	268	10.4%	98	11663739	14	13919625	0	0	3
Village of Durand	Winnebago	86	6.2%	31	4063707	4	1678191	0	0	4
City of Loves Park	Winnebago	1254	7.0%	489	48833670	92	34406595	50	25666719	31
Village of Machesney Park	Winnebago	3192	13.9%	1239	151956819	40	40698636	15	2591901	6
Village of New Millford	Winnebago	36	3.2%	14	1317444	2	1004145	0	0	1
Village of Pecatonica	Winnebago	74	4.2%	27	2145438	9	2373588	4	226506	3
City of Rockford	Winnebago	3575	3.3%	1369	156350088	246	123448788	155	64672281	96
Village of Rockton	Winnebago	179	350.0%	68	12017043	18	3547173	2	1388610	5
Village of Roscoe	Winnebago	815	9.6%	281	45446514	22	7738455	18	1879953	25
City of South Beloit	Winnebago	933	18.6%	364	16219869	143	16256832	94	19120242	13
Village of Winnebago	Winnebago	0	0.0%	0	0	0	0	0	0	0
Winnebago County	Winnebago	10343	12.6%	2660	349296618	104	21976467	64	19522755	165

Appendix A

Resolution and Executive Orders

Appendix B

Winnebago County Multi-Hazard Mitigation Plan Original Scope of Work

Winnebago County Multi-Hazard Mitigation Plan
Winnebago County, Illinois
Scope of Work

Purpose and Objectives

Winnebago County is very much interested in better identifying and mitigating risk to our local assets that are vulnerable to natural hazards. The County understands that preparing an initial multi-jurisdictional mitigation plan is the first step in a process that will ultimately improve the quality of life throughout our communities.

This plan will be developed according to criteria set forth under the Disaster Mitigation Act of 2000. The plan will address hazards that include flooding, severe summer storms, severe winter storms, earthquakes, tornados and other manmade hazards including transportation and utility interruptions.

The objectives of this plan are to:

1. Work cooperatively with local, state, federal and private entities,
2. Encourage local participation in the plan by leveraging multi-media resources,
3. Prepare a plan that follows the criteria established within 44.CFR Part 201,
4. Develop the plan in a manner that compliments the 2004 Illinois Natural Hazard Mitigation Plan
5. Utilize existing data whenever possible, and
6. Prepare maps and data in a consistent GIS format,

Scope of Work

The purpose of this scope of work is to identify the primary processes required to achieve a successful countywide multi-hazard mitigation plan. Each process is described below and clearly identifies what will be done, who will do it, the anticipated outcome and the metrics that will be used to measure the success and benefits from each process.

The scope of work to develop this plan will consist of the following five primary processes: Planning, Risk Assessment, Mitigation Strategy, Plan Maintenance, Plan Adoption. The products delivered through each process will be provided to the local Hazard Mitigation Planning Committee for review and incorporation into the countywide plan. The Committee will also rely upon the input and coordination to be provided by a qualified hazard mitigation consultant.

Process 1: Planning Process

The Hazard Mitigation Planning Team currently consists of local County and community officials that are committed to hazard mitigation. The current group includes the Winnebago County Emergency Services and Disaster Agency (ESDA), City of Rockford floodplain administer and ESDA, the County Housing Authority and Health Department, and WinGIS, a countywide geographic information systems agency. This local planning team will grow to include additional representatives to complete a cross section of the communities throughout Winnebago County including residents, government officials, community leaders and business owners.

The consultant will provide a draft resolution for the County Board to recognize the planning team as a Committee and specify its duties and appointing chair. The resolution will detail each community's participation, responsibility and authorized / appointed representative.

The Hazard Mitigation Planning Committee is expected to meet four to five times throughout the planning process. It will be the responsibility of this committee to participate individually as well as collectively throughout the entire duration of the plan's development. This responsibility includes:

- Holding public hearings, meetings and workshops,
- Soliciting hazard related input from knowledgeable resources,
- Gathering and assessing reasonable mitigation measures,
- Reviewing products derived from planning activities and providing value-added feedback,
- Involvement in the adoption, implementation and overall sustainability of the plan.

The Hazard Mitigation Planning Committee will work with its consultant to develop an inventory of needed data, plans, studies, maps, ordinances and other documents to support the development of the mitigation plan. In addition, the committee will involve the public throughout the planning process.

Public involvement will be achieved multiple ways. Besides public meetings and including public stakeholders as part of the Hazard Mitigation Planning Committee, press releases will be disseminated via multi-media outlets to solicit local comments and concerns. A website will also be hosted by WinGIS to keep the public informed to the plan's development and progress, meeting dates and provide access to the local hazards survey/questionnaire. A finally, a final public meeting will be held to share to the draft hazard mitigation plan for the County.

The consultant will facilitate the review of products and information received during the data collection phase of the planning process. This will be performed in conjunction with local research to determine if any other activities the County may be involved in could impact hazard mitigation or success.

The benefits of the planning process are numerous. It not only builds support for the plan, but establishes the foundation for identifying and understanding the risks throughout Winnebago County. If performed correctly, this process will provide the momentum to ensure the plan's success and ultimate adoption / implementation.

Please refer to the *Schedule Section* within this document for a time table of the Planning Process.

<u>Process 2: Risk Assessment (Hazard Identification and Vulnerability)</u>

The risk and vulnerability assessment process will develop a description and prioritization of the natural hazards that have occurred within each community. At a minimum, the assessments will be performed for: Severe Storms (including wind, hail and lightning), Floods, Severe Winter Storms, Drought, Extreme Heat, Earthquakes, and Tornados. These natural hazard categories are consistent with the 2004 Illinois Natural Hazard Mitigation Plan.

The Hazard Identification component of this process will consist of the consultant reviewing the available data from the following sources:

- County and municipal databases and historic records,
- Existing plans, studies and publications,
- Federal databases including past claims and repetitive loss information,
- 2004 Illinois Natural Hazard Mitigation Plan, and

- Other resources including individuals and public documents.

The consultant will work with the above information and local Hazard Mitigation Planning Committee to identify the frequency of each hazard and the probability of future events. The hazard information will coincide with relevant descriptions and quantifications of the local vulnerability. Once identified, the data created from this effort will then be incorporated geographically within the County's GIS system and according to WinGIS standards. This geospatial data will include locations, types and numbers of existing and, where possible, future buildings, infrastructure and critical facilities at risk to various hazards assessed within this plan. Corresponding cost estimates for past and future potential losses will also be calculated and included within this activity.

The consultant will summarize this information using hazard identification assessment worksheets and mapping. Together, the consultant and the Hazard Mitigation Planning Committee will work to establish a hazard profile for the County and relate the information to potential impacts to public safety, public health, infrastructure and property damage.

Given the City of Rockford is interested in joining FEMA's Community Rating System (CRS), special attention will focused toward investigating local repetitive loss and past mitigation activities. Repetitive loss areas will be identified and this plan will detail the activities that meet all CRS planning and loss reduction criteria.

This process will benefit the plan significantly. As a result of researching and assessing the risks to our communities, Winnebago County will become positioned to set the goals and objectives for the mitigation plan. Please refer to the *Schedule Section* within this document for a time table of the Planning Process.

Process 3: Multiple Hazard Mitigation Strategy

The planning committee will work with its consultant to develop mitigation strategies consistent with goals for reducing risk associated with each of the hazards. These strategies will ultimately serve as the action plan to reduce or avoid long-term vulnerabilities to the hazards identified throughout the County. The strategies will consist of actions and projects that reduce the effects of each hazard with particular emphasis on buildings and infrastructure. As part of this plan, hazard type, mitigation measures, estimated costs and responsible agencies, and targeted timeframes will be identified to better ensure and track the plan's success throughout the future.

Specifically the mitigation strategies will account for ongoing or proposed future activities planned throughout the County. These and other recommend activities will be organized into the five general categories:

- *Preventative activities* that keep problems from becoming exacerbated through regulations including building codes, development of hazardous areas and local planning or capital improvement projects.
- *Property protection* activities that are building or parcel specific such as flood proofing, acquisition or retrofitting.
- *Emergency services* measures implemented during a disaster to minimize associated impacts.
- *Structural projects* that control flooding, drainage, and other hazards.
- *Public information* initiatives that educate residents to local hazards and the protective measures they can perform to better protect themselves and their property.

The consultant will work with the Committee and representatives from each community to incorporate all of the above strategies into the countywide plan. As a group, the Committee will

seek to identify and establish incentives that will encourage participation in each of the recommended mitigation strategies / activities. Please refer to the *Schedule Section* within this document for a time table of the Planning Process.

Process 4: Hazard Mitigation Plan Maintenance Process

As part of this process, the Committee will identify how the mitigation plan will be updated and maintained. This will consist of incorporating the requirements of the mitigation strategies into appropriate County and community planning documents with a specified maintenance schedule.

It will be the Committee's responsibility to assist local jurisdictions in:

- Monitoring, evaluating and updating the plan,
- Incorporating into existing planning mechanisms,
- Designating an implementation schedule with plan revisions and updates every five years,
- Continuing public involvement through appropriate outreach activities.

These details will be organized as part of the Draft Plan. In addition to providing an overview and descriptions of the planning process, the hazard assessment, the goals and a summary of appropriate measures, the plan will include a section for Action Plans.

Process 5: Hazard Mitigation Plan Review, Approval and Adoption.

Following the Committee's review and approval, a draft version of the mitigation will be provided to appropriate agencies and organizations that participated during the plan's developmental process. The comments received during this review will be incorporated to generate an updated draft version of the plan.

The plan will then be made available to the general public through various multi-media avenues. A final public meeting will be held where all members of the Committee, community officials, stakeholders and the general public will be invited to review the Draft Mitigation Plan. Once comments have been received, the Committee will work with its consultant to revise the plan accordingly. Following revisions, a final version of the plan be submitted to the Illinois Emergency Management Agency and FEMA for official review. While this official review and revision process may be iterative, it is to be performed based upon plan approval pending local adoption.

Following FEMA and IEMA's approval of the plan pending adoption, the plan will be submitted to the County Board and the City Councils and Village Boards for each participating jurisdiction. Each Board or Council will then formally adopt the plan. Following receipt of proof of adoption and approval, both FEMA and IEMA will formally recognize the plan complete and approved.

Schedule

The development of the Winnebago County Multi-Hazard Mitigation Plan is estimated to approximate 16 months. The planning process requires much coordination and is envisioned to continue throughout the project's entire duration. Tasks will be performed concurrently when possible to expedite the project. The Committee will ensure that all hours are recorded properly and that in-kind matching support is maximized in a responsible and value-added manner. It is understood that FEMA's review process could take up to 2 months per review period.

	Months from Award Notice							
Tasks	**1 2**	**3 4**	**5 6**	**7 8**	**9 10**	**11 12**	**13 14**	**15 16**
1 - Planning Process	X	X	X	X	X	X	X	X
2 - Risk Assessment		X	X	X				
3 - Mitigation Strategy			X	X	X			
4 - Plan Maintenance					X	X		
5 - Plan Adoption & Approval						X	X	X

Costs

The total estimated cost to complete the Winnebago County Multi-Hazard Mitigation Plan is $80,000. The 25% non-federal share of this project is provided by Winnebago County and its participating communities. The match is comprised of $10,000 worth of in-kind services and $10,000 of cash matching through hard dollars, GIS products and materials.

	Consultant $125/hr		Winnebago County $40/hr			
Tasks	Hours	Cost	Hours (in kind)	Cost (in kind)	Cash and GIS Products	**Task Budget**
Pre-Award Planning *		*($5,000)*	11	$ 440	$ 5,000	**$ 5,440**
1 - Planning Process	85	$ 10,625	40	$ 1,600	$ 200	**$ 12,425**
2 - Risk Assessment	125	$ 15,625	55	$ 2,200	$ 150	**$ 17,975**
3 - Mitigation Strategy	150	$ 18,750	55	$ 2,200	$ 150	**$ 21,100**
4 - Plan Maintenance	55	$ 6,875	40	$ 1,600		**$ 8,475**
5 - Plan Adoption & Approval	65	$ 8,125	40	$ 1,600		**$ 9,725**
Document Reproduction			10	$ 360	$ 1,500	**$ 1,860**
Consultant Travel *		*($3,000)*			$ 3,000	**$ 3,000**
Totals	480	$ 60,000	$ 251	$ 10,000	$ 10,000	**$ 80,000**
Percent of Project		75%		12.5%	12.5%	

* The City of Rockford is a primary participant with vested interest for initiating the Winnebago County Multi-Hazard Mitigation Plan. The City has contributed hard dollar cash matching funds to reimburse consultant expenses for pre-award planning and application initiation fees. These fees were recognized prior to award but after the PDM application period had opened. Additional cash match funding has been obligated by the City for anticipated future consultant travel expenses.

Funding

IEMA/FEMA Planning Grant	$60,000	75%
Winnebago County Cash Match	$10,000	12.5%
Winnebago County In-Kind Services	$10,000	12.5%
Project Total	$80,000	100%

Appendix C

Timeline

Appendix C: Timeline

The timeline for plan completion is as follows:

Wednesday September 26: Stakeholder and community meeting invitation materials sent to Winnebago County from FMSM.

Thursday, September 27: Winnebago County forwards stakeholder meeting invitations to designated representatives and publicly advertises October 4 Community Meeting. The County is also encouraged to use radio, television and newspaper media to promote the public portion of the meeting.

Thursday October 9, Afternoon Stakeholder Meeting. This meeting will be to inform stakeholders of project roles and responsibilities. The primary purpose of this meeting will be to describe the Hazard Assessment portion of the project and request local data sets, historical documents, and other information sources to help better identify local areas of risk.

Thursday October 9, Evening Public Meeting. This meeting will be to inform general public of plan goals and ways in which they may participate. Specifically locals will be invited to complete Hazard Surveys (either online or on paper) to better inform the project team of area hazards. Their input is heavily encouraged by FEMA.

Thursday November 8. Afternoon Stakeholder Meeting. This meeting will present the results of the Hazard Assessment and to specifically define local mitigation actions and strategies. For example, clear creek of debris 2x per year. Develop a flood warning system, etc.

Thursday November 8. Evening Public Meeting. This meeting will be to inform the general public the results of the afternoon meeting and solicit any additional feedback. The County is encouraged to use radio, television and newspaper media to promote this public meeting prior to its occurrence.

Wednesday November 30. FMSM submits draft plan to Winnebago County for digital dissemination and local review. Winnebago County will be encouraged to also print public copies of the plan in visible places (ie. Libraries, Post Offices, etc). The County is encouraged to use radio, television and newspaper media to promote document locations and encourage review.

Friday December 14, Local comment period ends. Winnebago County sends comments to FMSM. Together we conference call to resolve issues.

Friday December 21, FMSM submits Final plan to Winnebago County.
Friday December 21, Winnebago County forwards plan to IEMA.

Appendix D

Documentation of Meetings

Appendix D: Documentation of Meetings

Meeting Minutes:

Minutes of the Winnebago Multi-Hazard Mitigation Planning Committee Stakeholder Kick-Off Meeting
October 9, 2007
1:30pm to 3:30pm

Members Present: Chad Atkinson, Village of Machesney Park; Gary Ballard, Village of Roscoe; Bonnie Beard, Village of New Millford; Stephen Butler, Winnebago County; Joe Caveny, Village of Cherry Valley; Scott Christiansen, Winnebago County; Jon Paul Diipla, City of Rockford; Brian Eber, City of Rockford; Marilyn Hartley, City of South Beloit; Dan Jacobson, City of Loves Park; Jonah Katz, City of Rockford; Rob Martin, Winnebago County; Dennis McMullin, Village of Rockton; Pat McNamer, Village of Pecatonica; Lawrence Morrissey, City of Rockford; David Nord, Village of Cherry Valley; Gordon Nygren, Village of Rockton; Todd Stockbarger, Winnebago County; David Townsend, Winnebago County; Burnie Turner, City of Rockford; Joe Vanderwerff, Winnebago County; Linda Vaughn, Village of Machesney Park; Alan Zais, Winnebago County

FMSM Staff Present: Mike Anderson and John Malueg

The first meeting of the Winnebago Multi-Hazard Mitigation Planning Committee was held on October 9, 2007 in Room 510 at the Winnebago County Administration Building at 404 Elm Street, Rockford Illinois. Mike Anderson called the meeting to order at 1:30pm and gave the opening remarks and thanked everyone for being there.

Overview of Presentation:

- Winnebago County has been awarded a Pre-Disaster Mitigation (PDM) planning grant.
- What should a countywide mitigation plan do?
    - Reduce or eliminate long-term risk to human life and property.
    - Give a community a ‘comprehensive’ guide for future mitigation efforts.
    - Include representation from every community in the county.
- What should a mitigation plan not do?
    - It will not replace your Emergency Operation Plan
    - It will only look at natural hazards
- What can a hazard mitigation plan do?
    - Identify and assess risk.
    - Develop strategies for reducing risk.
    - Improve communication between agencies.
    - Enhance existing programs.
    - Provide eligibility for future mitigation program funding.

- Project Goals:
    - Create a countywide Multi-Hazard Mitigation Plan to:
        - Protect lives, property, economic viability and quality of life,
        - Become more disaster resistant,
        - Compliment existing efforts
        - Organize future mitigation efforts.
- Roles and Responsibilities
    - Core Group: Have an awareness of the process, gather information, offer your expertise, be a representative of your jurisdiction.
    - Planning Team Requirements: Obtain official recognition, understand plan process and maintenance, meet monthly during the plan, contribute to mitigation goals, and update the plan every 5 years.
    - Advisory Group: Provide documents, offer feedback, perform reviews on plan draft.
- Project Overview:
    - Planning Process
        - Meetings, stakeholder input, data gathering
    - Risk Assessment (Hazard Identification and Vulnerability)
        - Analyze past occurrences, probabilities, documents, and maps
    - Multiple Hazard Mitigation Strategy
        - Determine strategies to reduce risk (preventative, protection, projects, education, etc)
    - Hazard Mitigation Plan Maintenance Process
        - Periodic plan monitoring, evaluating and updating through annual reviews and the 5 year update.
    - Hazard Mitigation Plan Review, Approval, and Adoption
        - Committee, Advisory group, public review, and council adoption
- Plan Schedule and Important Dates:
  1. Planning Process [throughout the 3 month period]
  2. Risk Assessment (Hazard Identification and Vulnerability), [October 9, 2007 – November 8, 2007]
  3. Multiple Hazard Mitigation Strategy, [November 8, 2007 – November 21, 2007]
  4. Hazard Mitigation Plan Maintenance Process, [November 8, 2007 – December 7, 2007]
  5. Hazard Mitigation Plan Review, Approval and Adoption, [December 14, 2007 – X]

After the schedule was sketched out, the Planning committee then began to complete tasks that were relevant to the planning process. The planning committee and advisory group then formed a mission statement to best describe the purpose of the plan, prioritized hazard, defined critical facilities, reviewed a draft questionnaire, and completed a questionnaire. Next, data and current document needs were discussed within the group, and the Planning committee was given the task

to find these items. Overviews of the remaining sections of the plan were given including: Risk Assessment, Mitigation Strategies, Plan Maintenance, and Review, Approval, and Adoption of the plan.

Minutes of the Public Kickoff Meeting
October 9, 2007
6:30-8:30pm

The first public kickoff meeting was held on October 9, 2007 in the auditorium at Memorial Hall at 211 North Main Street, Rockford IL. While the public meeting was poorly attended, local news / media were present to document the purpose and intent of the hazard mitigation plan. Ultimately, the news segment that aired highlighted the planning effort and directed people to the website for more information. Information on the website included:

- The Mission statement which is: "To protect life, property, and the environment through coordination and cooperation among stakeholders, reduce risk and loss, and enhance the quality of life for the people of Winnebago County" which was formed by the Planning Committee and Advisory group,
- The Winnebago County Multi-Hazard Mitigation Plan PowerPoint presentation,
- The brochure which was distributed to each community and placed in government buildings and city halls,
- The Kickoff meeting agenda,
- The Planning Committee's Roles and Responsibilities,
- The draft Hazard Profile section of the plan;
- The dates of future Planning Committee meetings and public meetings (both open to the public), and
- The Multi-Hazard Questionnaire which allows for additional comments and feedback at the end.

Also, due to media attention and local official encouragement, the hazard mitigation questionnaire, that was available online and by hard copy, received a large circulation and completion ratio compared to before the media was involved.

Minutes of the Winnebago Multi-Hazard Mitigation Planning Committee Second Stakeholder Meeting
November 8, 2007
1:30pm to 3:30pm

Members Present: Dale Adams, Village of Rockton; Chad Atkinson, Village of Machesney Park; Sharon Atkins, Village of Roscoe; Bonnie Beard, Village of New Millford; Joe Caveny, Village of Cherry Valley; Robert Corwin, Village of Durand; Jon Paul Diipla, City of Rockford; Brian Eber, City of Rockford; Dina Getty, Winnebago County; Marilyn Hartley, City of South Beloit; Dan Jacobson, City of Loves Park; Jonah Katz, City of Rockford; Marcy Leach, City of Rockford; Dennis Lolli, Winnebago County; Pat McNamer, Larry Morrissey, City of Rockford;

Village of Pecatonica; Gordon Nygren, Village of Rockton; David Townsend, Winnebago County; Burnie Turner, City of Rockford; Joe Vanderwerff, Winnebago County; Jeff White, Village of Winnebago; Angela Wood-Zuzevich, Winnebago County

FMSM Staff Present: Mike Anderson

The second meeting of the Winnebago Multi-Hazard Mitigation Planning Committee was held on November 8, 2007 in Room 510 at the Winnebago County Administration Building at 404 Elm Street, Rockford Illinois. Mike Anderson called the meeting to order at 1:30pm and gave the opening remarks and thanked everyone for being there and asked that they sign the sign-in sheet.

Overview of Presentation and Work Group Session:

- Winnebago County has been awarded a Pre-Disaster Mitigation (PDM) planning grant.
- What can a hazard mitigation plan do?
    - Identify and assess risk.
    - Develop strategies for reducing risk.
    - Improve communication between agencies.
    - Enhance existing programs.
    - Provide eligibility for future mitigation program funding.
- Mission Statement:
    - To protect life, property and the environment through coordination and cooperation among stakeholders, reduce risk and loss, and enhance the quality of life for the people of Winnebago County.
- Today's Agenda:
    - Share Survey Results- The results gathered from the online questionnaire were shared with the group. Thus far, 257 people had completed it online.
    - Share Hazard Profile Results- The hazard profile section of the draft plan were displayed to ensure that all planning committee and advisory group members agreed with historical occurrences, emergency declarations, presidential declarations, and probability figures.
    - Share Vulnerability Assessment Results- The vulnerability assessment strategy was shared to make sure that everyone agreed with the methodology behind assessing the vulnerability. Next, the actual assessment results were shared with the group to verify that the hazard rankings concurred with their knowledge of the hazards. After discussing the vulnerability assessment, the critical facilities were examined and what their role was within the assessment. A couple of the jurisdictions wanted to supplement the HAZUS/WinGIS data with what they thought was critical facilities within their community. This data was to be given to the director of WinGIS so that a new GIS layer could be constructed and incorporated into the plan.

- Develop Mitigation Goals- The group separated out into working clusters to work on the mitigation worksheet packet to help develop broad mitigation goals for each of their jurisdictions for each of the hazards.
- Develop Mitigation Actions- After mitigation goals were in place, the groups then discussed possible mitigation actions that they could implement that would reduce their loss and risk to the hazards discussed.
    - New Structures/Infrastructure- The groups looked at new mitigation strategies that could be put in place for new structures that would decrease the effects from a natural hazard.
    - Existing Structures/Infrastructure- The separate groups also looked at possible mitigation strategies that could be implemented to older, existing structures to reduce their risk and loss to hazards.
- Prioritize Mitigation Actions- Once mitigation actions were decided upon, the teams next had to prioritize these projects in the order of importance, plausibility, funding, etc to help determine which mitigation actions were to be completed first.
- Capability Assessment- The group was given a checklist worksheet which was to be completed by November 16, 2007. The worksheet asked each jurisdiction which plans, ordinances, and documents they had in place and whether there were any mitigation strategies, emergency response routines, hazard notification policies (i.e. warning systems), etc in place currently that could be incorporated into the Multi-Hazard Mitigation Plan.
- Plan Maintenance Responsibilities- Plan maintenance responsibilities were discussed among the committee and group and they decided that a yearly committee meeting would be in order to review the plan and the years events to see how the plan worked for them before, during, and after any natural hazard occurred.
- Review Schedule- The schedule for the remaining time was reviewed, future action items were delegated and set a deadline, and dates were confirmed.

After the work session ended, deadline dates were given out for each jurisdiction to complete the mitigation worksheet packet and get any new critical facilities data to the director of WinGIS. Also, the jurisdictions were given the task to familiarize themselves with their existing plans and ordinances so that the incorporation into this plan could take place.

Minutes of the Public Kickoff Meeting
November 8, 2007
6:30-8:30pm

The second public kickoff meeting was held on November 8, 2007 in the City Counsel Chambers of Rockford City Hall located at 425 East State Street, Rockford Illinois. While the public meeting was poorly attended, local news / media Channel 13 were present to document the purpose and intent of the hazard mitigation plan. Joe Vanderwerff gave a statement to the media about what had occurred thus far on the plan, and where public could learn more information on the Hazard Mitigation Plan. Ultimately, the news segment that aired highlighted the planning effort and directed people to the website for more information. Information on the website included:

- The Mission statement which is: "To protect life, property, and the environment through coordination and cooperation among stakeholders, reduce risk and loss, and enhance the quality of life for the people of Winnebago County" which was formed by the Planning Committee and Advisory group,
- The Winnebago County Kickoff Multi-Hazard Mitigation Plan PowerPoint presentation and the Second Stakeholder's PowerPoint presentation
- The brochure which was distributed to each community and placed in government buildings and city halls,
- The Kickoff meeting agenda and the Second meeting's agenda
- The Planning Committee's Roles and Responsibilities,
- The draft Hazard Profile section, the draft Hazard Identification section, and the draft Profile tables sections of the plan
- The dates of future Planning Committee meetings and public meetings (both open to the public), and
- The Multi-Hazard Questionnaire which allows for additional comments and feedback at the end.

Also, due to media attention and local official encouragement, the website's overall exposure increased with more questionnaires's being completed and the draft sections of the plan reviewed.

Throughout various meetings, hazards were identified, analyzed, and prioritized by the likelihood of them affecting Winnebago County and its jurisdictions. The Planning Committee members adopted the HAZUS definition of a critical facility which separates critical buildings and facilities into five categories: Essentials facilities, Transportation Systems, Lifeline Utility Systems, High Potential Loss Facilities, and Hazardous Material Facilities and then identified those critical facilities in their jurisdiction. GIS resources and public input were used to identify hazards that affect the Winnebago County region. The Planning Committee members used the Illinois State Mitigation Plan as a source of information to help in identifying hazards and the Planning committee members and advisory group reviewed the definitions and discussed their occurrence in the region. Members also participated in identifying goals, objective, and strategies for each hazard that affects the region. FMSM Staff developed a plan maintenance schedule for the Winnebago Multi-Hazard Mitigation Plan. The plan maintenance schedule was presented to the Planning Committee and was approved to be included in the plan. Copies of the minutes from each of the Hazard Mitigation Planning Committee meetings are available in the above section.

Meeting Dates and Agenda:

A. A "KICKOFF" meeting was held on Tuesday, October 9, 2007 from 1:30 p.m. to 3:30 p.m. at the Winnebago County Administration Building at 404 Elm Street, Rockford IL, announcing the Winnebago County Multi-Hazard Mitigation Plan. Invitations were extended to each jurisdiction within Winnebago County to send a representative. Mike Anderson of FMSM Engineers gave a presentation on the requirements of the plan and what hazard mitigation plans accomplish. Next, the Planning Committee and Advisory group identified the roles and responsibilities of each Planning Committee and Advisory Group participant, developed a "Mission Statement" for the plan, defined critical facilities, reviewed and completed the Multi-Hazard Mitigation Questionnaire, and scheduled additional meetings dates.

B. A Public "KICKOFF" meeting was held on Tuesday, October 9, 2007 from 6:30 p.m. to 8:30 p.m. at Memorial Hall at 211 North Main Street in the City of Rockford, announcing the Winnebago County Multi-Hazard Mitigation Plan. Press releases were sent out the week before the meeting was held inviting all residents of Winnebago County to attend the informational meeting about the Multi-Hazard Mitigation Plan and to participate in the planning process. While the public meeting was poorly attended, local news/media were present to document the process and intent of the meeting. Joe Vanderwerff, a Winnebago County Engineer, gave a statement to the news crew encouraging the public's participation and for them to visit the Winnebago County website. Ultimately, the news segment aired highlighting the planning efforts and directed people to the website for additional information, handouts, presentations, etc. Also, local officials have encouraged public participation through filling out the questionnaire. Due to the media attention and local official encouragement, the public's response to the questionnaire has grown greatly from before the first meeting.

C. On Wednesday, October 24, 2007, the Planning Committee and Advisory Groups were asked to review the Hazard Profile section of the plan and offer their feedback. The two groups were asked to review historical data and events that had been collected for each natural hazard and to revise them if the listed historical events did not show the intensity or severity for Winnebago County. If the events were not up to par, the groups were asked to supplement the current events, with occurrences they had found. The groups were also asked to review the possible impacts associated with each hazard and to supplement them as needed if any particular impact had been left out of the profile. Also, the groups ranked the hazards in order of greatest concern for their area in order for the plan to reflect the thoughts of the planning team.

D. On October 26th and October 29th, a phone interview took place between each Planning Committee member and Mike Anderson of FMSM. The intent of the interview was to review the member's roles and responsibilities within the Planning Committee, ask them for their existing documents and plans currently in place, and to receive their feedback from the Hazard Profile review they completed earlier. Future meeting agendas and dates were discussed.

E. On Thursday, November 8, 2007, the second stakeholder meeting was held in the Winnebago County Administration Building at 404 Elm Street, Rockford IL from 1:30 p.m. to 3:30 p.m. Invitations were once again extended to each jurisdiction within Winnebago County to send a representative. Each jurisdiction sent at least one representative to this meeting to participate. Mike Anderson of FMSM Engineers gave a presentation on the plan and the progress that had been made to date. Results from the online questionnaire, hazard profiles, and

vulnerability assessment were shared and discussed among communities. Next, the Planning Committee and Advisory group got into groups and began filling out their mitigation activity worksheets. These worksheets asked the members to fill in existing mitigation activities from previous plans, possible mitigation goals and activities each community would like to initiate, and each community's capabilities in terms of existing documents, programs, and accessibility to information. The meeting ended with confirmation of action items to be completed by the planning committee by November 16th and future dates were established.

F. On Thursday, November 8, 2007, the second public meeting was held from 6:30 to 8:30 on Nov 8th in the City Council Chambers of Rockford City Hall located at 425 E. State Street in Rockford. Two separate newspaper articles were released prior to the meeting inviting all residents of Winnebago County to attend the informational meeting about the Multi-Hazard Mitigation Plan, to participate in the planning process and to offer input on mitigation strategies. One article was released from the Rockford Register Star, which is a daily countywide newspaper, on November 7th and the other article was released from the Beloit Daily News, which is a daily newspaper serving the northern portion of the county, on November 5th. While the public meeting was poorly attended, local news/media, Channel 13, were present to document the process and intent of the meeting. Joe Vanderwerff, a Winnebago County Engineer, gave a statement to the news crew encouraging the public's participation and for them to visit the Winnebago County website. Ultimately, the news segment aired highlighting the planning efforts and directed people to the website for additional information, handouts, presentations, and also for the draft sections of the plan that were available for public review. Due to the media attention and local official encouragement, the public's response to the draft mitigation plan has increased and responses have been reviewed.

Meeting Attendance:

An X next to the name and below a meeting date represents a "present" attendance at that Winnebago Multi-Hazard Planning Committee Meeting.

Table 1 Planning Committee Members and Meeting Participation

Jurisdiction	Representative	October 9, 2007	November 8, 2007
Village of Cherry Valley	David Nord	X	X[a]
Village of Durand	Gary Haughton	X	X[b]
City of Loves Park	Dan Jacobson	X	X
Village of Machesney Park	Chad Atkinson	X	X
Village of New Millford	Bonnie Beard	X	X
Village of Pecatonica	Pat McNamer	X	X
City of Rockford	Brian Eber	X	X
Village of Rockton	Gordy Nygren	X	X
Village of Roscoe	Sharon Atkins	X	X
City of South Beloit	Marilyn Hartley	X	X
Village of Winnebago	Stephen Butler	X	X[c]
Winnebago County	Dave Townsend	X	X

X*: Village of Cherry Valley sent representation through another community contact. That contact was Joe Caveny who is also an advisory group member.

X**: Village of Durand sent representation through another community contact. The contact was Robert Corwin who is also an advisory group member.

X***: Village of Winnebago sent representation through another community contact. That contact was Jeff White who is also an advisory group member.

Table 1. Advisory Group Members and Meeting Participation

Agency	Representative	October 9, 2007	November 8, 2007
Village of Cherry Valley	Joe Caveny	X	X
Village of Durand	Robert Corwin		X
Village of Machesney Park	Linda Vaughn	X	
Village of Rockton	Dale Adams		X
Village of Rockton	Dennis McMullen	X	
Village of Roscoe	Gary Ballard	X	
City of Rockford	John Paul Diipla	X	X
City of Rockford	Jonah Katz	X	X
City of Rockford	Lawrence Morrissey	X	X
City of Rockford	Marcy Leach		X
Village of Winnebago	Jeff White		X
Winnebago County	Allen Zais	X	
Winnebago County	Joe Vanderwerff	X	X
Winnebago County	Todd Stockbarger	X	
Winnebago County	Rob Martin	X	
Winnebago County	Burnie Turner	X	X
Winnebago County	Scott Christiansen	X	
Winnebago County	Dennis Lolli		X
Winnebago County	Dina Getty		X
Winnebago County	Angela Wood-Zuzevich		X

Appendix E

Record of Public Notice

Appendix E: Record of Public Notices

A public notice press release of each Winnebago County Multi-Hazard Mitigation Planning Committee meeting and public meeting was sent to all the media, elected officials, appointed officials, county board members, and everyone employed by the county that has an email. The media outlets include:

- Beloit Daily News Newspaper
- Radio Station WROK 1440 AM
- River Times Rock
- Rockford Register Star Newspaper
- TV Channel 13 (WREX)
- TV Channel 17 (WTVO)
- TV Channel 23 (WIFR)
- TV Channel 39 (WQRF)

Proof of sent notices is archived at the _____.

The following table lists dates the press releases or articles were distributed and announced to the media outlets.

Date Released	Media Outlet
October 1, 2007	Beloit Daily News
October 1, 2007	WROK 1440 AM
October 1, 2007	River Rock Times
October 1, 2007	Rockford Register Star
October 1, 2007	TV-WREX 13
October 1, 2007	TV- WTVO 17
October 1, 2007	TV-WIFR 23
October 1, 2007	TV- WQRF 39
October 10, 2007	Beloit Daily News
October 10, 2007	WROK 1440 AM
October 10, 2077	River Rock Times
October 10, 2007	Rockford Register Star
October 10, 2007	TV-WREX 13
October 10, 2007	TV- WTVO 17
October 10, 2007	TV-WIFR 23
October 10, 2007	TV- WQRF 39
November 5, 2007	Beloit Daily News
November 7, 2007	Rockford Register Star

<u>The October 1st Press Release was distributed to the above media and stated the following:</u>

"Rockford IL- Winnebago County Board Chairman Scott Christiansen announces the Kickoff Meeting for community input into preparation of the County's Multi-Hazard Mitigation Plan:

Tuesday, October 9, 2007
6:30 to 8:30 PM
Veteran's Memorial Hall Auditorium
211 North Main Street, Rockford IL 61101

Winnebago was recently awarded a FEMA grant to identify and assess countywide risk to natural hazards and develop measures for reducing this risk. This planning grant supports a partnership between the Illinois Emergency Management Agency, Winnebago County, local area governments, and the general public. The public is strongly encouraged to participate in the development of this plan beginning with the kickoff meeting. This is an important document that allows the County and other jurisdictions in the County to apply for federal assistance to help offset the cost of those measures.

All questions regarding the plan and this meeting should be directed to David Townsend of the Winnebago County Highway Department at 815-319-4000.

The October 10th Press Release was distributed to the above media and stated the following:

"Rockford IL- Winnebago County Board Chairman Scott Christiansen announces the Winnebago County Multi-Hazard Mitigation Plan kickoff meeting was held at Memorial Hall on October 9, 2007. This plan will identify and assess areas at risk to natural hazards including flooding, severe storms, drought, snow, earthquakes, and tornadoes. The plan will also develop mitigation strategies to reduce associated risk while also qualifying participating communities for future federal mitigation funding.

Local residents are encouraged to contribute to the planning process by completing an online survey that can be found on the County's website at http://www.co.winnebago.il.us and clicking on the Hazard Mitigation Planning link and then clicking on the Hazard Mitigation Survey link. For paper copies of the survey form and additional information, please contact David Townsend, Winnebago County Highway Department (815) 319-4000.

Area residents will have another opportunity to participate by attending the November 8, 2007 public meeting. Location and time is to be announced."

The November 5th News article in the Beloit Daily News stated the following:
"Winnebago County prepares for floods, other disasters"
"In an effort to prepare for future flooding in Winnebago County, officials are working on developing a pre-disaster mitigation plan and are asking for input from residents. 'It identifies and assesses probable natural hazards and estimates their consequences within Winnebago County for the following: Flooding, Severe Storms, Severe Winter Storms, Drought, Snow, Earthquakes, Tornadoes, and potentially other hazards,' said David Townsend, an engineer with the Winnebago County Highway Department.

Winnebago County got involved after receiving direction from the Federal Emergency Management Agency (FEMA) to develop the plan. 'The concept for the plan came from FEMA's commitment to better identify and mitigate the consequences of natural hazards and to protect or save lives from natural hazards,' Townsend explained. The county is working with the

Fuller, Mossbarger, Scott, and May Engineer consulting firm out of Lexington, Ky. Townsend explained FEMA hired the firm about four years ago to help update the county's flood maps. The flooding in Rockford and Cherry Valley area in the last two years has raised significant concerns and completing of the plan is therefore being expedited', he said. Having this plan would pre-qualify Winnebago County for future federal funding for possible mitigation projects. 'The local communities and county still must compete for federal funding on a project-by-project basis either nationally or statewide,' Townsend said. 'Examples of projects that might be eligible for federal funding could be purchasing properties that are at risk of flooding, flood proofing homes and businesses, making improvements that would lessen flood damage, building tornado shelters. The list goes on.'

On Thursday, a public hearing will be held and county residents are welcomed to hare concerns or suggestions. The meeting will be held 6:30-8:30 p.m. in the City Council Chamber of the Rockford City Hall, 425 E. State St. Before the public hearing, the stakeholders will meet 1:30-3:30 p.m. in the County Administration Building, 404 Elm Street, Rockford. 'The stakeholders meeting will be a works session, most likely with the attendees breaking up into focus groups to address the various (issues)', Townsend explained. 'The attendees will be elected officials and staff from each local community and from the county.'

Residents also can contribute to the planning process though an online survey found on the county's Web site, http://www.co.winnebago.il.us. Hard copies of the survey can be found at the Winnebago County Highway Department. Townsend said the county is looking to complete the plan by the end of the year, so it is on expedited schedule. If it is completed this year, the county, along with municipalities within the county, will be eligible for grants in the first part of 2008."

**The Beloit Daily News is a daily newspaper that serves the northern part of the county-City of South Beloit, Village of Rockton, and the Village of Roscoe area.

<u>The November 7th News Article in the Rockford Register Star stated the following:</u>

"Public Invited to discuss disaster mitigation"

"What steps should Winnebago County take to brace for tornadoes, floods, and other disasters? County officials want to hear residents' answers during a public meeting Thursday night at Rockford City Hall. Winnebago County and all the communities within it, including Rockford, are spearheading a study funded by a grant from the Illinois Emergency Management Agency that addresses the consequences of flooding, severe storms, severe winter storms, drought, snow, earthquakes, and tornadoes. The plan, when completed, will identify and assess areas at risk to natural hazards. The public is invited from 6:30 to 8:30 p.m. in council chambers of City Hall, 425 East State Street. Residents are also encouraged to complete an online survey on the county's web site at co.winnebago.il.us by clicking on the Winnebago County Multi-Hazard Mitigation Plan link found near the center of the home page. Paper copies of the survey form mare available from the Winnebago County Highway Department, 815-319-4000."

**The Rockford Register Star is a daily newspaper that serves the entire county and also has a website available for residents to view.

Appendix F

Hazard mitigation Questionnaire

Appendix F: Hazard Mitigation Questionnaire Documents

Winnebago County Multi-Hazard Mitigation Plan Questionnaire

**For more information, please contact David Townsend by email: dtownsend@co.winnebago.il.us **

NATURAL HAZARD INFORMATION

1. Please indicate where you live in Winnebago County:

- ☐ Cherry Valley
- ☐ Durand
- ☐ Loves Park
- ☐ Machesney Park
- ☐ Pecatonica
- ☐ Rockford
- ☐ Rockton
- ☐ Roscoe
- ☐ Seward
- ☐ Shirland
- ☐ South Beloit
- ☐ Winnebago
- ☐ Other Unincorporated Winnebago County Area *Please Specify*: _____

2. In the past 10 years, have you or someone in your household experienced a natural disaster *within Winnebago County* such as: severe storms, floods, winter storms, extreme heat, tornadoes, drought, earthquakes, or other natural disaster?

- ☐ Yes
- ☐ No

2a. **If yes to question #2**,
Which of the following types of natural hazard events have you or someone in your household experienced? (Please check all that apply) *If you answered no to question #2, please move on to question #3.*

- ☐ Severe Weather damage in excess of $500
- ☐ Floods
- ☐ Winter Storms
- ☐ Extreme Heat
- ☐ Tornadoes
- ☐ Drought
- ☐ Earthquakes
- ☐ Other (Please specify)_____

3. Do you consider yourself prepared for the probable impacts from natural hazard events that may occur within your community or Winnebago County?

- ☐ Yes
- ☐ No

3a. **If yes to question #3**,
Where did you learn about being prepared for a disaster? (Please check all that apply) * *If you answered NO to question #3, please move on to question #4*

- ☐ Emergency preparedness information from a government source (i.e. Federal, State, or Local emergency management)
- ☐ Personal experience. Have experienced one or more natural hazard events
- ☐ Locally provided news or other media information
- ☐ Schools and other educational institutions
- ☐ Meetings or trainings offered by volunteer organizations (Red Cross, etc)
- ☐ Other (please specify) _____

3b. Please check, on a scale of 1 to 5, how prepared you feel and your household are for the probable impacts of natural hazard events likely to occur within Winnebago County.

- ☐ 1 Not at all prepared
- ☐ 2 Somewhat prepared
- ☐ 3 Adequately prepared
- ☐ 4 Well prepared
- ☐ 5 Very well prepared

3c. What steps, if any, have you or someone in your household taken to prepare for a natural disaster? (Check all that apply)
Have stored or stocked up on:

- ☐ Food
- ☐ Water
- ☐ Flashlight (s)
- ☐ Batteries
- ☐ Battery-powered radio
- ☐ Medical supplies (First Aid Kit)
- ☐ Fire extinguisher
- ☐ Smoke detector on each level of the house
- ☐ Prepared a disaster supply kit
- ☐ Received First Aid/ CPR training
- ☐ Made a fire escape plan
- ☐ Discussed utility shutoffs
- ☐ Other (please specify) _____

4. How concerned are you about the following natural hazards impacting your community and or/ the greater Winnebago County area (*Please check the corresponding number for each hazard)*

Natural Hazard	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned
Severe Storm (wind, lightening)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Flood	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Winter Storms	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Extreme Heat	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Tornados	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Drought	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Earthquakes	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Other Please specify: _____	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

5. What are the most effective ways for you to receive information about how to make your household and home safer from natural disasters? (*Please check all that apply*)

Newspapers:
- ☐ Newspaper stories
- ☐ Newspaper ads

Television:
- ☐ Television news
- ☐ Television ads

Radio:
- ☐ Radio news
- ☐ Radio ads

Other Methods:
- ☐ Schools
- ☐ Books
- ☐ Mail
- ☐ Fire Department/Rescue
- ☐ Internet
- ☐ Fact sheet/Brochure
- ☐ Chamber of Commerce
- ☐ Public workshops/Meetings
- ☐ Magazine
- ☐ University or research institution
- ☐ Other (*please explain*): _____

6. To the best of your knowledge, is your property located in a designated floodplain?
- ☐ Yes
- ☐ No
- ☐ Not sure

6a. To the best of your knowledge, is your property located in close proximity (<1 mile) to an earthquake fault line?
- ☐ Yes
- ☐ No
- ☐ Not sure

7. Do you have flood insurance?
- ☐ Yes
- ☐ No

8. Do you have earthquake insurance?
- ☐ Yes
- ☐ No

9. How vulnerable to damage is your infrastructure to:

Natural Hazard	Severely Vulnerable	Moderately Vulnerable	Minimally Vulnerable	Don't Know
Severe Storm (wind, lightening)	☐ 3	☐ 2	☐ 1	☐ 0
Flood	☐ 3	☐ 2	☐ 1	☐ 0
Winter Storms	☐ 3	☐ 2	☐ 1	☐ 0
Extreme Heat	☐ 3	☐ 2	☐ 1	☐ 0
Tornados	☐ 3	☐ 2	☐ 1	☐ 0
Drought	☐ 3	☐ 2	☐ 1	☐ 0
Earthquakes	☐ 3	☐ 2	☐ 1	☐ 0
Other *Please specify*: _____	☐ 3	☐ 2	☐ 1	☐ 0

9a.) How vulnerable to damage are the critical facilities (i.e. police stations, fire stations, emergency operation centers, etc) within your jurisdiction to:

Natural Hazard	Severely Vulnerable	Moderately Vulnerable	Minimally Vulnerable	Don't Know
Severe Storm (wind, lightening)	☐ 3	☐ 2	☐ 1	☐ 0
Flood	☐ 3	☐ 2	☐ 1	☐ 0
Winter Storms	☐ 3	☐ 2	☐ 1	☐ 0
Extreme Heat	☐ 3	☐ 2	☐ 1	☐ 0
Tornados	☐ 3	☐ 2	☐ 1	☐ 0
Drought	☐ 3	☐ 2	☐ 1	☐ 0
Earthquakes	☐ 3	☐ 2	☐ 1	☐ 0
Other *Please specify*: _____	☐ 3	☐ 2	☐ 1	☐ 0

NATURAL HAZARD MITIGATION

10. Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you purchased or moved in?

☐ Yes
☐ No

11. Was the presence of a natural hazard risk zone (i.e. flood zone, fault zone, etc) disclosed to you by a Real Estate agent, Seller, or Landlord before you purchased/moved into your home?

☐ Yes
☐ No

12. Would the disclosure of this type of information influence your decision to purchase/move into a home?

- ☐ Yes
- ☐ No

13. Would you be willing to spend money to modify/retrofit your current home from the impacts of future natural disasters? (Examples of retrofitting are: Elevating a flood prone home, bolting a foundation for seismic impacts, or improving home exteriors to withstand higher winds)

- ☐ Yes
- ☐ No
- ☐ Maybe

(*If you answered NO, please skip to question #15)*

14. How much money would you be willing to spend to better protect your home from the impacts of natural disasters?

- ☐ $5,000 and above
- ☐ $2,500 to $4,999
- ☐ $1,000 to $2,499
- ☐ $500 to $999
- ☐ $100 to $499
- ☐ Less than $100
- ☐ Nothing
- ☐ Don't know
- ☐ Other (please specify) _____

15. Which of the following **incentives** would help to encourage you to spend money to retrofit your home from the possible impacts of natural disasters (*Please check all that apply)*

- ☐ Low interest rate loan
- ☐ Insurance premium discount
- ☐ Mortgage discount
- ☐ Property tax break or incentive
- ☐ Grant funding that requires a "Cost-Share"
- ☐ None
- ☐ Other (please specify)_____

16. If your property were located in a designated high hazard area or had received repetitive damages from a natural event, would you consider a buyout or relocation offered by a public agency?

- ☐ Yes
- ☐ No

GENERAL HOUSEHOLD INFORMATION

17. Please indicate your age range:
    - ☐ 18 to 29
    - ☐ 30 to 39
    - ☐ 40 to 49
    - ☐ 50 to 59
    - ☐ 60 or over

18. Gender:
    - ☐ Male
    - ☐ Female

19. Please indicate your highest level of education:
    - ☐ Grade school/no schooling
    - ☐ Some high school
    - ☐ High school graduate/GED
    - ☐ Some College/Trade school
    - ☐ College Degree
    - ☐ Post Graduate degree
    - ☐ Other _____

20. How long have you lived in Winnebago County?
    - ☐ Less than 1 year
    - ☐ 1 to 4 years
    - ☐ 5 to 9 years
    - ☐ 10 to 19 years
    - ☐ 20 or more years

21. Do you have access to the Internet?
    - ☐ Yes
    - ☐ No

22. Do you own or rent your home?
    - ☐ Own
    - ☐ Rent

23. Do you own/rent a:
    - ☐ Single-family home
    - ☐ Duplex
    - ☐ Apartment (3-4 units in structure)
    - ☐ Apartment (5 or more units in structure)
    - ☐ Condominium/townhouse
    - ☐ Manufactured home
    - ☐ Other _____

24. **Other Comments:**

1. Please indicate where you live in Winnebago County:

	Response Percent	Response Count
Cherry Valley	4.6%	12
Durand	1.5%	4
Loves Park	4.2%	11
Machesney Park	10.3%	27
New Milford	0.8%	2
Pecatonica	2.7%	7
Rockford	**46.2%**	121
Rockton	5.3%	14
Roscoe	7.3%	19
Seward	0.8%	2
Shirland	0.4%	1
South Beloit	2.3%	6
Winnebago	3.8%	10
Other Unincorporated Winnebago County Area (please specify)	9.9%	26
	answered question	**262**
	skipped question	**0**

2. In the past 10 years, have you or someone in your household experienced a natural disaster within Winnebago County such as: severe storms, floods, winter storms, extreme heat, tornadoes, drought, earthquakes, or other natural disaster?

	Response Percent	Response Count
Yes	**54.6%**	143
No	45.4%	119
	answered question	**262**
	skipped question	**0**

2a. If yes to question #2, Which of the following types of natural hazard events have you or someone in your household experienced? (Please check all that apply) If you answered no to question #2, please move on to question #3.

	Response Percent	Response Count
Severe Weather damage in excess of $500	**45.5%**	65
Floods	41.3%	59
Winter Storms	36.4%	52
Extreme Heat	21.0%	30
Tornadoes	5.6%	8
Drought	9.1%	13
Earthquakes	0.7%	1
Other (please specify)	14.7%	21
	answered question	**143**
	skipped question	**119**

3. Do you consider yourself prepared for the probable impacts from natural hazard events that may occur within your community and/or the greater Winnebago County?

	Response Percent	Response Count
Yes	49.6%	130
No	**50.4%**	132
	answered question	**262**
	skipped question	**0**

3a. If yes to question #3, Where did you learn about being prepared for a disaster? (Please check all that apply) * If you answered no to question #3, please move on to question #4

	Response Percent	Response Count
Emergency preparedness information from a government source (i.e. Federal, State, or Local emergency management)	**50.4%**	68
Personal experience. Have experienced one or more natural hazard events	37.8%	51
Locally provided news or other media information	42.2%	57
Schools and other educational institutions	11.1%	15
Meetings or trainings offered by volunteer organizations (Red Cross, etc)	18.5%	25
Other (please specify)	17.8%	24
	answered question	**135**
	skipped question	**127**

3b. Please check, on a scale of 1 to 5, how prepared you feel and your household are for the probable impacts of natural hazard events likely to occur within Winnebago County.

	Response Percent	Response Count
1 Not at all prepared	13.0%	28
2 Somewhat prepared	**47.7%**	103
3 Adequately prepared	24.5%	53
4 Well prepared	12.0%	26
5 Very well prepared	2.8%	6
	answered question	**216**
	skipped question	**46**

3c. What steps, if any, have you or someone in your household taken to prepare for a natural disaster? (Check all that apply)

	Response Percent	Response Count
Food	43.7%	94
Water	47.4%	102
Flashlight(s)	84.2%	181
Batteries	70.2%	151
Battery-powered radio	48.8%	105
Medical supplies (First Aid Kit)	57.2%	123
Fire extinguisher	68.4%	147
Smoke detector on each level of the house	**90.2%**	194
Prepared a disaster supply kit	12.1%	26
Received First Aid/ CPR training	57.7%	124
Made a fire escape plan	38.1%	82
Discussed utility shutoffs	22.8%	49
Other (please specify)	7.4%	16
	answered question	**215**

	skipped question	**47**

4. How concerned are you about the following natural hazards impacting your community and or/ the greater Winnebago County area?

	Not Concerned	Somewhat Concerned	Concerned	Very Concerned	Extremely Concerned	Response Count
Severe Storm (wind, lightning)	6.5% (17)	22.5% (59)	**36.6% (96)**	26.0% (68)	8.4% (22)	262
Flood	17.2% (45)	24.0% (63)	**30.2% (79)**	17.2% (45)	11.5% (30)	262
Winter Storms	8.4% (22)	27.5% (72)	**38.9% (102)**	19.5% (51)	5.7% (15)	262
Extreme Heat	22.5% (59)	**36.6% (96)**	27.9% (73)	10.7% (28)	2.3% (6)	262
Tornadoes	8.0% (21)	24.8% (65)	**32.4% (85)**	24.0% (63)	10.7% (28)	262
Drought	**34.4% (90)**	**34.4% (90)**	20.6% (54)	8.0% (21)	2.7% (7)	262
Earthquakes	**60.3% (158)**	23.3% (61)	11.1% (29)	3.8% (10)	1.5% (4)	262
					Other (please specify)	9
					answered question	**262**
					skipped question	**0**

5. What are the most effective ways for you to receive information about how to make your household and home safer from natural disasters? (Please check all that apply)

	Response Percent	Response Count
Newspapers	61.8%	162
Television	**79.0%**	207
Radio	57.3%	150
Schools	16.4%	43
Books	7.6%	20
Mail	32.4%	85
Fire Department/Rescue	18.7%	49
Internet	56.9%	149
Fact sheet/Brochure	41.6%	109
Chamber of Commerce	2.7%	7
Public workshops/Meetings	19.5%	51
Magazine	5.7%	15
University or research institution	4.2%	11
Other (please specify)	6.5%	17
	answered question	**262**
	skipped question	**0**

6. To the best of your knowledge, is your property located in a designated floodplain?

	Response Percent	Response Count
Yes	6.9%	18
No	**79.8%**	209
Not Sure	13.4%	35
	answered question	**262**
	skipped question	**0**

6a. To the best of your knowledge, is your property located in close proximity (<1 mile) to an earthquake fault line?

	Response Percent	Response Count
Yes	2.7%	7
No	**56.5%**	148
Not Sure	40.8%	107
	answered question	**262**
	skipped question	**0**

7. Do you have flood insurance?

	Response Percent	Response Count
Yes	8.4%	22
No	**91.6%**	240
	answered question	**262**
	skipped question	**0**

8. Do you have earthquake insurance?

	Response Percent	Response Count
Yes	6.9%	18
No	**93.1%**	244
	answered question	**262**
	skipped question	**0**

9. How vulnerable to damage is your infrastructure to:

	Severely Vulnerable	Moderately Vulnerable	Minimally Vulnerable	Don't Know	Response Count
Severe Storm(wind/lightning)	9.9% (26)	**45.4% (119)**	29.4% (77)	15.3% (40)	262
Flood	9.2% (24)	23.7% (62)	**55.3% (145)**	11.8% (31)	262
Winter Storms	9.9% (26)	34.0% (89)	**42.4% (111)**	13.7% (36)	262
Extreme Heat	3.1% (8)	22.5% (59)	**57.3% (150)**	17.2% (45)	262
Tornadoes	22.5% (59)	**42.0% (110)**	19.8% (52)	15.6% (41)	262
Drought	2.7% (7)	13.4% (35)	**60.7% (159)**	23.3% (61)	262
Earthquakes	6.1% (16)	11.8% (31)	40.8% (107)	**41.2% (108)**	262
				Other (please specify)	2
				answered question	**262**
				skipped question	**0**

9a.) How vulnerable to damage are the critical facilities (i.e. police stations, fire stations, emergency operation centers, etc) within your jurisdiction to:

	Severely Vulnerable	Moderately Vulnerable	Minimally Vulnerable	Don't Know	Response Count
Severe Storm(wind/lightning)	5.0% (13)	29.0% (76)	26.3% (69)	**39.7% (104)**	262
Flood	4.6% (12)	17.6% (46)	35.5% (93)	**42.4% (111)**	262
Winter Storms	6.5% (17)	25.6% (67)	28.6% (75)	**39.3% (103)**	262
Extreme Heat	4.2% (11)	13.7% (36)	39.7% (104)	**42.4% (111)**	262
Tornadoes	11.5% (30)	26.7% (70)	22.9% (60)	**38.9% (102)**	262
Drought	2.3% (6)	10.7% (28)	42.7% (112)	**44.3% (116)**	262
Earthquakes	5.3% (14)	13.0% (34)	33.2% (87)	**48.5% (127)**	262
				Other (please specify)	2
				answered question	**262**
				skipped question	**0**

10. Did you consider the impact that the possible occurrence of a natural disaster would have on your home before you purchased or moved in?

	Response Percent	Response Count
Yes	29.8%	73
No	**70.2%**	172
	answered question	**245**
	skipped question	**17**

11. Was the presence of a natural hazard risk zone (i.e. flood zone, fault zone, etc) disclosed to you by a Real Estate agent, Seller, or Landlord before you purchased/moved into your home?

	Response Percent	Response Count
Yes	16.3%	40
No	**83.7%**	205
	answered question	**245**
	skipped question	**17**

12. Would the disclosure of this type of information influence your decision to purchase/move into a home?

	Response Percent	Response Count
Yes	**91.4%**	224
No	8.6%	21
	answered question	**245**
	skipped question	**17**

13. Would you be willing to spend money to modify/retrofit your current home from the impacts of future natural disasters? (Examples of retrofitting are: Elevating a flood prone home, bolting a foundation for seismic impacts, or improving home exteriors to withstand higher winds) (If you answered No, please skip to #15)

	Response Percent	Response Count
Yes	**38.0%**	93
No	26.9%	66
Maybe	35.1%	86
	answered question	**245**
	skipped question	**17**

14. How much money would you be willing to spend to better protect your home from the impacts of natural disasters?

	Response Percent	Response Count
$5,000 and above	12.2%	30
$2,500 to $4,999	14.7%	36
$1,000 to $2,499	13.5%	33
$500 to $999	5.3%	13
$100 to $499	5.3%	13
Less than $100	1.6%	4
Nothing	10.6%	26
Don’t know	**32.7%**	80
Other (please specify)	4.1%	10
	answered question	**245**
	skipped question	**17**

15. Which of the following incentives would help to encourage you to spend money to retrofit your home from the possible impacts of natural disasters (Please check all that apply)

	Response Percent	Response Count
Low interest rate loan	40.8%	100
Insurance premium discount	56.7%	139
Mortgage discount	48.2%	118
Property tax break or incentive	**73.9%**	181
Grant funding that requires a "Cost-Share"	47.8%	117
None	8.2%	20
Other (please specify)	5.7%	14
	answered question	**245**
	skipped question	**17**

16. If your property were located in a designated high hazard area or had received repetitive damages from a natural event, would you consider a buyout or relocation offered by a public agency?

	Response Percent	Response Count
Yes	**89.8%**	220
No	10.2%	25
	answered question	**245**
	skipped question	**17**

17. Please indicate your age range:

	Response Percent	Response Count
18 to 29	9.2%	22
30 to 39	25.5%	61
40 to 49	27.2%	65
50 to 59	**29.7%**	71
60 or over	8.8%	21
	answered question	**239**
	skipped question	**23**

18. Gender:

	Response Percent	Response Count
Male	36.4%	87
Female	**64.0%**	153
	answered question	**239**
	skipped question	**23**

19. Please indicate your highest level of education:

	Response Percent	Response Count
Grade school/no schooling	0.0%	0
Some high school	0.4%	1
High school graduate/GED	10.0%	24
Some College/Trade school	28.9%	69
College Degree	**43.9%**	105
Post Graduate degree	15.1%	36
Other (please specify)	2.1%	5
	answered question	**239**
	skipped question	**23**

20. How long have you lived in Winnebago County?

	Response Percent	Response Count
Less than 1 year	3.3%	8
1 to 4 years	5.0%	12
5 to 9 years	5.9%	14
10 to 19 years	12.6%	30
20 or more years	**73.6%**	176
	answered question	**239**
	skipped question	**23**

21. Do you have access to the Internet?

	Response Percent	Response Count
Yes	**98.7%**	236
No	1.7%	4
	answered question	**239**
	skipped question	**23**

22. Do you own or rent your home?

	Response Percent	Response Count
Own	**89.5%**	214
Rent	10.9%	26
	answered question	**239**
	skipped question	**23**

23. Do you own/rent a:

	Response Percent	Response Count
Single-family home	**88.7%**	212
Duplex	4.2%	10
Apartment (3-4 units in structure)	0.8%	2
Apartment (5 or more units in structure)	2.1%	5
Condominium/townhouse	2.5%	6
Manufactured home	0.4%	1
Other (please specify)	1.7%	4
	answered question	**239**
	skipped question	**23**

24. Other Comments:		
		Response Count
		21
	answered question	**21**
	skipped question	**241**

Appendix G

Profiling Hazard Events Tables and Data

Appendix G: Profiling Hazard Events: Tables and Data

National Climatic Data Center (NCDC) receives data from the National Weather Service (NWS). The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. Following is the NCDC information collected, including detailed event tables.

FLOOD

The following information table is from the NCDC database and lists 21 floods occurring during 1950-2007. NCDC receives data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public.

NCDC Winnegabo County Query Results – 21 Floods 1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Kishwaukee	2/19/1994	12:00pm	Flood	N/A	0	0	0	0
Rockton and Roscoe	8/16/1995	7:30pm	Small Stream/Urban Flood	N/A	0	0	0	0
Winnebago County	5/28/1996	6:30am	Flash Flood	N/A	0	0	0	0
Winnebago County	7/17/1996	6:00pm	Flash Flood	N/A	0	0	0	0
Winnebago and Surrounding Counties	2/20/1997	6:00pm	Flood	N/A	1	0	0	0
Winnebago County	6/25/1998	10:00pm	Flash Flood	N/A	0	0	0	0
Winnebago and Surrounding Counties	6/13/1999	12:00pm	Flood	N/A	0	0	0	0
Winnebago County	6/4/2000	11:00am	Flood	N/A	0	0	0	0
Winnebago County	6/12/2000	01:00pm	Flash Flood	N/A	0	0	0	0
Winnebago and Surrounding Counties	6/12/2000	03:00pm	Flood	N/A	0	0	0	0
Winnebago County	6/4/2002	03:00am	Flash Flood	N/A	0	0	0	0
Winnebago and Surrounding Counties	6/4/2002	07:00am	Flood	N/A	0	0	0	0
Winnebago and Surrounding	8/22/2002	06:00am	Flood	N/A	0	0	0	0

NCDC Winnegabo County Query Results – 21 Floods
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Counties								
Winnebago County	8/22/2002	12:30am	Flash Flood	N/A	0	0	0	0
Durand	5/20/2004	06:20pm	Flash Flood	N/A	0	0	0	0
Winnebago County	6/11/2004	11:00pm	Flood	N/A	0	0	0	0
Winnebago and Surrounding Counties	2/14/2005	03:07am	Flood	N/A	0	0	0	0
Rockford	5/30/2006	06:53pm	Flood	N/A	0	0	0	0
Rockford	8/25/2006	03:37pm	Flash Flood	N/A	0	0	0	0
Rockford	9/4/2006	3:40pm	Flash Flood	N/A	0	0	$20.0M	0

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

* Note. 8/7/2007 flood damage was appended to table and estimated from City of Rockford and not part of the current National Climatic Data Center data set. Final damage estimates are pending and will be included in the 5 year update of this plan.

HAIL

NCDC receives data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. Please see a detailed NCDC table after the following event detail.

NCDC Query Winnebago County Results -75 Hail Events
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago	6/28/1960	4:17 pm	Hail	2.00 in	0	0	0	0
Winnebago	9/8/1960	6:00 pm	Hail	1.75 in	0	0	0	0
Winnebago	11/17/1963	1:25 pm	Hail	1.00 in	0	0	0	0
Winnebago	4/16/1967	11:55 am	Hail	0.75 in	0	0	0	0
Winnebago	4/21/1967	3:30 pm	Hail	1.00 in	0	0	0	0

NCDC Query Winnebago County Results -75 Hail Events 1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago	7/26/1967	1:00 pm	Hail	0.75 in	0	0	0	0
Winnebago	06/01/1971	7:37 pm	Hail	1.75 in	0	0	0	0
Winnebago	6/1/1971	8:50 pm	Hail	0.75 in	0	0	0	0
Winnebago	09/17/1972	3:05 pm	Hail	1.75 in	0	0	0	0
Winnebago	09/17/1972	4:00 pm	Hail	1.75 in	0	0	0	0
Winnebago	09/17/1972	4:22 pm	Hail	1.00 in	0	0	0	0
Winnebago	6/14/1974	6:20 pm	Hail	0.75 in	0	0	0	0
Winnebago	7/6/1978	4:45 pm	Hail	1.75 in	0	0	0	0
Winnebago	6/7/1980	7:54 am	Hail	3.00 in	0	0	0	0
Winnebago	6/7/1980	8:00 am	Hail	1.75 in	0	0	0	0
Winnebago	6/7/1980	8:03 am	Hail	2.50 in	0	0	0	0
Winnebago	4/10/1981	7:25 pm	Hail	1.00 in	0	0	0	0
Winnebago	5/17/1982	10:25 pm	Hail	1.75 in	0	0	0	0
Winnebago	7/5/1982	2:50 pm	Hail	0.75 in	0	0	0	0
Winnebago	07/06/1982	2:50 pm	Hail	1.00 in	0	0	0	0
Winnebago	5/18/1984	5:40 pm	Hail	1.75 in	0	0	0	0
Winnebago	5/18/1984	6:05 pm	Hail	0.75 in	0	0	0	0
Winnebago	5/26/1985	6:00 pm	Hail	1.00 in	0	0	0	0
Winnebago	06/23/1985	8:37 am	Hail	0.75 in	0	0	0	0
Winnebago	7/19/1986	5:40 pm	Hail	1.10 in	0	0	0	0
Winnebago	5/21/1987	2:25 am	Hail	1.00 in	0	0	0	0
Winnebago	5/21/1987	6:37 pm	Hail	1.75 in	0	0	0	0
Winnebago	5/21/1987	10:45 pm	Hail	1.75 in	0	0	0	0
Winnebago	7/26/1987	4:05 pm	Hail	1.25 in	0	0	0	0

NCDC Query Winnebago County Results -75 Hail Events 1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago	4/5/1988	6:20 pm	Hail	0.75 in	0	0	0	0
Winnebago	08/18/1988	2:30 pm	Hail	1.75 in	0	0	0	0
Winnebago	5/30/1989	3:30 pm	Hail	0.75 in	0	0	0	0
Winnebago	7/27/1989	6:32 pm	Hail	1.75 in	0	0	0	0
Winnebago	8/28/1990	1:10 pm	Hail	2.50 in	0	0	0	0
Winnebago	3/27/1991	1:49 pm	Hail	0.75 in	0	0	0	0
Winnebago	6/17/1992	11:05 am	Hail	1.50 in	0	0	0	0
Winnebago	6/17/1992	11:34 am	Hail	0.75 in	0	0	0	0
Rockford	2/26/1996	10:06 pm	Hail	1.75 in	0	0	0	0
Rockford	4/19/1996	8:55 pm	Hail	1.75 in	0	0	0	0
West of Rockford	7/28/1996	8:44 pm	Tstm Wind/ hail	75 kts	0	0	0	0
Rockford	7/28/1996	9:00 pm	Hail	0.75 in	0	0	0	0
Rockford	05/18/1997	6:03 pm	Hail	0.75 in	0	0	0	0
Rockford	6/20/1997	6:25 pm	Hail	1.75 in	0	0	0	0
Rockford	5/28/1998	7:55 am	Hail	1.00 in	0	0	0	0
Rockford	6/18/1998	2:52 pm	Hail	0.75 in	0	0	0	0
Rockford	03/08/2000	5:10 pm	Hail	0.75 in	0	0	0	0
Pecatonica	10/23/2001	10:15 pm	Hail	1.50 in	0	0	0	0
Rockford	10/23/2001	11:43 pm	Hail	0.75 in	0	0	0	0
New Millford	04/18/2002	5:25 pm	Hail	1.75 in	0	0	0	0
Rockford	6/3/2002	6:10 pm	Hail	0.75 in	0	0	0	0
Rockton	7/31/2003	4:25 pm	Hail	1.00 in	0	0	0	0
New Millford	04/17/2004	1:05 am	Hail	0.75 in	0	0	0	0
Rockford	4/17/2004	1:25 am	Hail	0.75 in	0	0	0	0

NCDC Query Winnebago County Results -75 Hail Events 1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Rockford	5/21/2004	11:19 pm	Hail	0.75 in	0	0	0	0
Rockford	6/11/2004	6:51 pm	Hail	0.88 in	0	0	0	0
Shirland	6/11/2004	7:01 pm	Hail	0.75 in	0	0	0	0
Roscoe	6/11/2004	8:30 pm	Hail	1.00 in	0	0	0	0
Rockton	5/19/2005	3:02 pm	Hail	1.75 in	0	0	0	0
Durand	5/19/2005	3:36 pm	Hail	0.88 in	0	0	0	0
Loves Park	5/27/2005	4:51 pm	Hail	1.00 in	0	0	0	0
Loves Park	6/29/2005	5:15 pm	Hail	1.00 in	0	0	0	0
Pecatonica	3/8/2006	7:51 pm	Hail	1.75 in	0	0	0	0
Rockton	3/8/2006	8:21 pm	Hail	0.75 in	0	0	0	0
South Beloit	03/12/2006	10:08 pm	Hail	0.88 in	0	0	0	0
Pecatonica	03/12/2006	10:23 pm	Hail	1.00 in	0	0	0	0
Rockford	4/13/2006	8:42 pm	Hail	1.75 in	0	0	0	0
Cherry Valley	4/13/2006	8:47 pm	Hail	2.00 in	0	0	0	0
Loves Park	4/13/2006	12:36 pm	Hail	0.88 in	0	0	0	0
Loves Park	6/28/2006	1:29 am	Hail	0.88 in	0	0	0	0
Rockford	8/25/2006	12:54 pm	Hail	1.00 in	0	0	0	0
Rockford	9/4/2006	1:03 pm	Hail	0.75 in	0	0	0	0
Rockford	9/4/2006	2:25 pm	Hail	0.88 in	0	0	0	0
Rockford	9/4/2006	2:42 pm	Hail	1.75 in	0	0	0	0
Durand	10/2/2006	8:18 pm	Hail	0.88 in	0	0	0	0
Rockford	10/2/2006	8:34 pm	Hail	0.88 in	0	0	0	0
TOTALS:					0	0	0	0

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

SEVERE STORMS

NCDC receives Storm Data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. Following are the NCDC query results for thunderstorm and lightning.

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago County	6/28/1960	4:17pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/18/1960	9:00pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	4/20/1961	5:00pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	9/1/1961	10:00pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	5/8/1964	7:15am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	4/11/1965	2:45pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/26/1965	9:30pm	Tstm Wind	60 kts	0	0	0	0
Winnebago County	7/10/1966	11:33pm	Tstm Wind	50 kts	0	0	0	0
Winnebago County	4/21/1967	4:45pm	Tstm Wind	70 kts	0	0	0	0
Winnebago County	5/18/1967	7:47pm	Tstm Wind	60 kts	0	0	0	0
Winnebago County	6/12/1967	4:00pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/9/1968	7:00pm	Tstm Wind	50 kts	0	0	0	0
Winnebago County	6/29/1968	7:45am	Tstm Wind	75 kts	0	0	0	0
Winnebago County	9/5/1968	5:30pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	6/17/1970	1:40pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	3/14/1971	9:45pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	9/4/1971	5:00pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	8/16/1972	6:55pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/20/1974	5:45pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/20/19	5:50pm	Tstm	53 kts	0	0	0	0

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
	74		Wind					
Winnebago County	6/22/1974	9:42am	Tstm Wind	58 kts	0	0	0	0
Winnebago County	5/20/1975	3:42pm	Tstm Wind	61 kts	0	0	0	0
Winnebago County	6/13/1975	5:20pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	11/29/1975	9:30pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	11/29/1975	10:30pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	4/15/1976	4:12pm	Tstm Wind	53 kts	0	0	0	0
Winnebago County	7/15/1977	3:00pm	Tstm Wind	55 kts	0	0	0	0
Winnebago County	6/5/1980	12:44am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/16/1980	2:29am	Tstm Wind	67 kts	0	0	0	0
Winnebago County	8/2/1980	8:05am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/2/1980	8:23am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/2/1980	9:15am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/4/1980	6:15pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/6/1982	2:50pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	8/4/1982	12:27am	Tstm Wind	58 kts	0	0	0	0
Winnebago County	8/24/1982	6:40pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	12/28/1982	1:00am	Tstm Wind	52 kts	0	0	0	0
Winnebago County	7/19/1983	7:55pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/20/1983	4:03pm	Tstm Wind	58 kts	0	0	0	0
Winnebago County	9/5/1983	11:30pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	9/6/1983	12:00am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/10/1984	7:27pm	Tstm Wind	61 kts	0	0	0	0
Winnebago County	5/11/1985	7:45pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	5/14/19	7:00pm	Tstm	56 kts	0	0	0	0

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
	85		Wind					
Winnebago County	7/8/1986	7:25pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/6/1987	2:34pm	Tstm Wind	57 kts	0	0	0	0
Winnebago County	8/4/1987	3:15pm	Tstm Wind	57 kts	0	0	0	0
Winnebago County	8/4/1987	3:55pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/16/1987	5:30pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	5/8/1988	4:40pm	Tstm Wind	70 kts	0	0	0	0
Winnebago County	9/19/1988	3:32pm	Tstm Wind	50 kts	0	0	0	0
Winnebago County	11/15/1988	10:45pm	Tstm Wind	51 kts	1	0	0	0
Winnebago County	7/27/1989	6:14pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/4/1989	12:30am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/31/1989	11:50pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	6/13/1990	11:47am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/28/1990	12:05am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/29/1990	12:40am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/18/1990	1:15pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	8/19/1990	4:50pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	4/10/1992	7:50pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	6/17/1992	11:02am	Tstm Wind	0 kts	0	0	0	0
Winnebago County	7/13/1992	3:40pm	Tstm Wind	0 kts	0	0	0	0
Pecatonica	4/18/1995	9:50am	Tstm Winds	N/A	0	0	0	0
Rockford	7/4/1995	10:45pm	Tstm Winds	N/A	0	0	50K	0
Winnebago and Surrounding Counties	10/24/1995	12:00pm	High Wind	0 kts	2	0	0	0
Winnebago and Surrounding Counties	3/25/1996	12:00am	High Wind	48 kts	0	0	0	0
Rockton	4/19/19	09:05pm	Tstm	0 kts	0	0	0	0

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
	96		Wind					
South Beloit	4/19/1996	09:10pm	Tstm Wind	0 kts	0	0	0	0
West of Rockford	7/28/1996	08:44pm	Tstm Wind/ Hail	75 kts	0	0	0	0
Winnebago County	10/29/1996	04:45pm	Tstm Wind	0 kts	0	0	0	0
Winnebago County	4/6/1997	09:00am	High Wind	56 kts	0	0	0	0
Sugar River	6/15/1997	08:45pm	Tstm Wind	50 kts	0	0	0	0
Rockford	6/24/1997	04:30pm	Tstm Wind	50 kts	0	0	0	0
Rockford	7/18/1997	01:40pm	Tstm Wind	52 kts	0	0	0	0
Winnebago County	9/16/1997	08:03pm	Tstm Wind	50 kts	0	0	0	0
Winnebago and Surrounding Counties	9/29/1997	12:00pm	High Wind	56 kts	0	0	0	0
Winnebago County	5/28/1998	08:25pm	Tstm Wind	50 kts	0	0	0	0
Rockford	6/18/1998	02:58pm	Tstm Wind	50 kts	0	0	0	0
Loves Park	6/18/1998	06:05pm	Tstm Wind	N/A	0	0	0	0
Winnebago County	6/28/1998	01:50am	Tstm Wind	50 kts	0	0	0	0
Rockford	7/19/1998	03:02am	Tstm Wind	53 kts	0	0	0	0
Seward	8/24/1998	11:30am	Tstm Wind	64 kts	0	0	0	0
Winnebago and Surrounding Counties	11/10/1998	07:30am	High Wind	56 kts	0	4	0	0
Rockford	2/11/1999	02:30pm	Tstm Wind	59 kts	0	0	0	0
Pecatonica	6/1/1999	06:10pm	Tstm Wind	50 kts	0	0	0	0
Rockton	7/20/1999	03:15pm	Tstm Wind	52 kts	0	0	0	0
Rockford	5/18/2000	01:40pm	Tstm Wind	50 kts	0	0	0	0
Rockford	6/1/2000	07:03pm	Tstm Wind	56 kts	0	0	0	0
Durand	9/11/2000	07:15pm	Tstm Wind	50 kts	0	0	0	0
Winnebago and Surrounding Counties	2/25/2001	04:00am	Strong Wind	N/A	0	0	0	0

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago and Surrounding Counties	4/7/2001	09:00am	High Wind	50 kts	1	1	0	0
South Beloit	6/11/2001	10:10pm	Tstm Wind	61 kts	0	0	0	0
Winnebago County	6/14/2001	06:40pm	Tstm Wind	55 kts	0		25K	
Rockton	9/7/2001	07:05pm	Tstm Wind	50 kts	0	0	0	0
Winnebago and Surrounding Counties	10/25/2001	06:00am	High Wind	51 kts	0	3	75K	0
Winnebago and Surrounding Counties	3/9/2002	11:52am	High Wind	51 kts	4	4	200k	0
Rockford	4/18/2002	06:05pm	Tstm Wind	55 kts	0	0	0	0
Rockford	6/10/2002	05:45pm	Tstm Wind	50 kts	0	0	0	0
Durand	8/21/2002	06:10pm	Tstm Wind	51 kts	0	0	0	0
Rockford	9/19/2002	11:40am	Tstm Wind	50 kts	0	0	0	0
Winnebago and Surrounding Counties	10/4/2002	03:00pm	High Wind	50 kts	0	0	0	0
Pecatonica	5/9/2003	12:40am	Tstm Wind	50 kts	0	0	0	0
Winnebago County	6/28/2003	04:25pm	Tstm Wind	55 kts	0	0	0	0
Pecatonica	7/5/2003	03:10am	Tstm Wind	90 kts	0	0	5.0 M	0
Rockton	7/15/2003	02:00am	Tstm Wind	55 kts	0	0	0	0
Roscoe	7/31/2003	04:45pm	Tstm Wind	50 kts	0	0	0	0
Winnebago and Surrounding Counties	11/13/2003	02:00pm	High Wind	51 kts	0	2	0	0
Loves Park	5/21/2004	08:00am	Tstm Wind	50 kts	0	0	0	0
Rockford	9/13/2005	04:05pm	Tstm Wind	55 kts	0	0	0	0
Cherry Vly	9/13/2005	05:20pm	Tstm Wind	50 kts	0	0	0	0
Rockford	7/17/2006	08:50pm	Tstm Wind	50 kts	0	0	0	0
Loves Park	7/17/2006	09:00pm	Tstm Wind	50 kts	0	0	0	0
Rockford	7/17/2006	9:03pm	Tstm Wind	52 kts	0	0	0	0
Shirland	7/20/2006	02:41am	Tstm Wind	50 kts	0	0	0	0

NCDC Query Winnebago County Results -118 Thunderstorm and High Wind
1950-2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago	7/20/2006	02:45am	Tstm Wind	50 kts	0	0	0	0
Roscoe	7/20/2006	02:50am	Tstm Wind	50 kts	0	0	0	0
Pecatonica	8/25/2006	3:49pm	Heavy Rain	N/A	0	0	0	0
TOTALS:					8	14	$5.35 M	0

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

LIGHTNING

NCDC Winnebago County Query Results -2 Lightning
1950 - 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Rockford	8/19/1996	6:59 pm	Lightning	N/A	0	0	0	0
Winnebago	9/04/2006	3:00 pm	Lightning	N/A	0	0	50K	0
TOTALS:					0	0	50K	0

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

SEVERE WINTER STORMS

NCDC receives data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. The following table shows 22 winter storm events from the NCDC's website archives.

NCDC Query Winnebago County Results
22 Snow, Ice, and Extreme Cold Events
1950 - 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago and Surrounding Counties	2/2/1996	12:00am	Extreme Cold	N/A	3	0	0	0
Winnebago and Surrounding Counties	1/23/2003	01:00am	Extreme Cold/Wind Chill	N/A	1	0	0	0
Winnebago and Surrounding Counties	1/29/2004	06:00pm	Extreme Cold/Wind Chill	N/A	0	0	0	0
Winnebago and Surrounding Counties	2/18/2006	12:00am	Extreme Cold/Wind Chill	N/A	1	0	0	0
Winnebago and Surrounding Counties	2/1/2007	12:00am	Extreme Cold/Wind Chill	N/A	0	0	0	0
Northern Illinois	12/6/1994	11:00am	Winter Storm	N/A	7	0	$1.0M	0
Winnebago and Surrounding Counties	1/18/1995	06:00pm	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	12/8/1995	12:00pm	Winter Storm	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/15/1997	06:00am	Winter Storm	N/A	5	0	0	0
Winnebago and Surrounding Counties	1/8/1998	06:00am	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/1/1999	07:00pm	Heavy Snow	N/A	1	0	0	0
Winnebago and Surrounding Counties	3/8/1999	05:00pm	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/19/2000	12:00pm	Heavy Snow	N/A	0	0	0	0

NCDC Query Winnebago County Results
22 Snow, Ice, and Extreme Cold Events
1950 - 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago and Surrounding Counties	2/18/2000	03:00am	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	12/11/2000	03:00am	Heavy Snow	N/A	0	0	$483K	0
Winnebago and Surrounding Counties	1/30/2002	07:00pm	Winter Storm	N/A	0	0	0	0
Winnebago and Surrounding Counties	3/2/2002	09:00am	Winter Storm	N/A	0	0	0	0
Winnebago and Surrounding Counties	3/4/2003	10:00pm	Winter Storm	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/4/2005	07:00pm	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/21/2005	04:00pm	Heavy Snow	N/A	0	0	0	0
Winnebago and Surrounding Counties	11/30/2006	6:00pm	Winter Storm	N/A	0	0	0	0
Winnebago and Surrounding Counties	12/1/2006	12:00am	Winter Storm	N/A	0	0	784K	0
TOTALS:					**18**	**0**	**$2.26M**	**0**

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

TORNADO

The following table of tornado events is from the NCDC's website archives and shows the event dates during 1950 - 2007 along with the magnitude and damage caused. NCDC receives Storm Data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, skywarn spotters, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public.

NCDC Winnebago County Results - 10 Tornados
1950 – 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago	8/30/1958	7:50pm	Tornado	F2	0	0	25K	0
*Winnebago	10/8/1958	11:30pm	Tornado	F2	0	0	0	0
Winnebago	6/11/1967	01:20pm	Tornado	F1	0	0	25K	0
Winnebago	8/17/1979	08:40pm	Tornado	F2	0	0	250K	0
Winnebago	9/28/1986	5:15pm	Tornado	F0	0	0	0K	0
Winnebago	8/28/1990	12:42pm	Tornado	F1	0	0	25K	0
Winnebago	4/29/1991	06:55pm	Tornado	F0	0	0	0K	0
Durand	6/25/1998	07:37pm	Tornado	F0	0	0	0	0
Shirland	5/30/2003	5:25om	Tornado	F0	0	0	0	0
Rockton	5/30/2003	5:33pm	Tornado	F0	0	0	0	0
TOTALS:					**0**	**0**	**325K**	**0**

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

*Note: This tornado was not found in the NCDC dataset. It was found at http://www.tornadoproject.com/alltorns/iltorn.htm#top which listed the top tornados for Winnebago County including all the ones listed from NCDC.

DROUGHT

NCDC receives data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. The following table shows 9 months of drought from the NCDC's website archives.

NCDC Winnebago County Results-9 Continuous Months
1950 – 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Winnebago and Surrounding Counties	6/15/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	7/1/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	8/1/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and	9/1/2005	12:00am	Drought	N/A	0	0	0	0

NCDC Winnebago County Results-9 Continuous Months
1950 – 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Surrounding Counties								
Winnebago and Surrounding Counties	10/1/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	11/1/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	12/1/2005	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	1/1/2006	12:00am	Drought	N/A	0	0	0	0
Winnebago and Surrounding Counties	2/1/2006	12:00am	Drought	N/A	0	0	0	0
TOTALS:					**0**	**0**	**0**	**0**

http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

EXTREME HEAT

NCDC receives data from the NWS. The NWS receives their information from a variety of sources, which include but are not limited to: county, state and federal emergency management officials, local law enforcement officials, NWS damage surveys, newspaper clipping services, the insurance industry, and the general public. The following table shows 3 extreme heat events from the NCDC's website archives.

NCDC Winnebago County Results - 3 Events
1950 - 2007

Location or County	Date	Time	Type	Mag	Death	Injuries	Property Damage	Crop Damage
Northeast Illinois	7/12/1995	11:00am	Heat	N/A	583	0	0	0
Winnebago County	6/5/1999	03:00pm	Heat	N/A	2	0	0	0
Winnebago County	8/1/2006	12:00am	Heat	N/A	1	0	0	0
TOTALS:					**586**	**0**	**0**	**0**

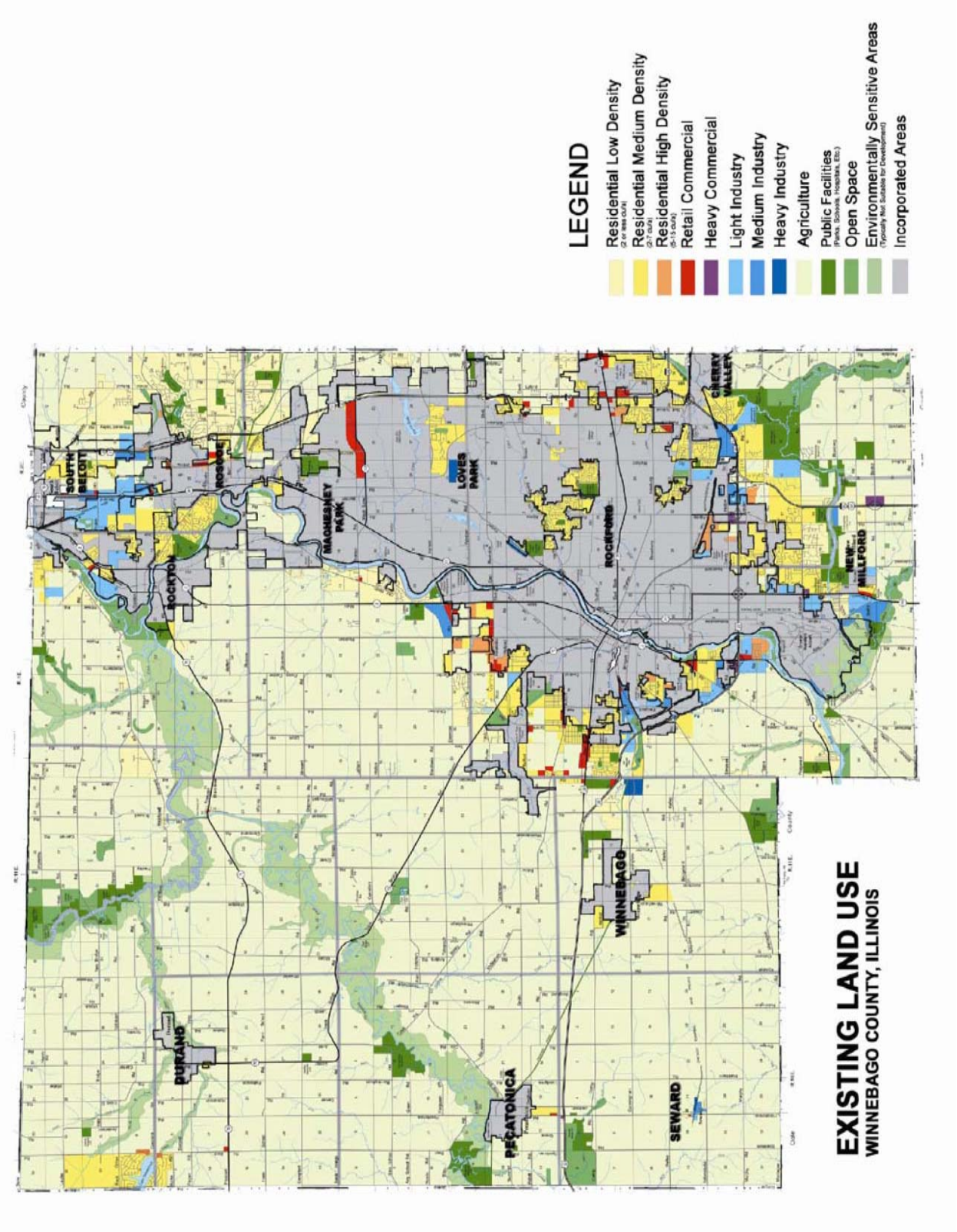
http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms

Appendix H

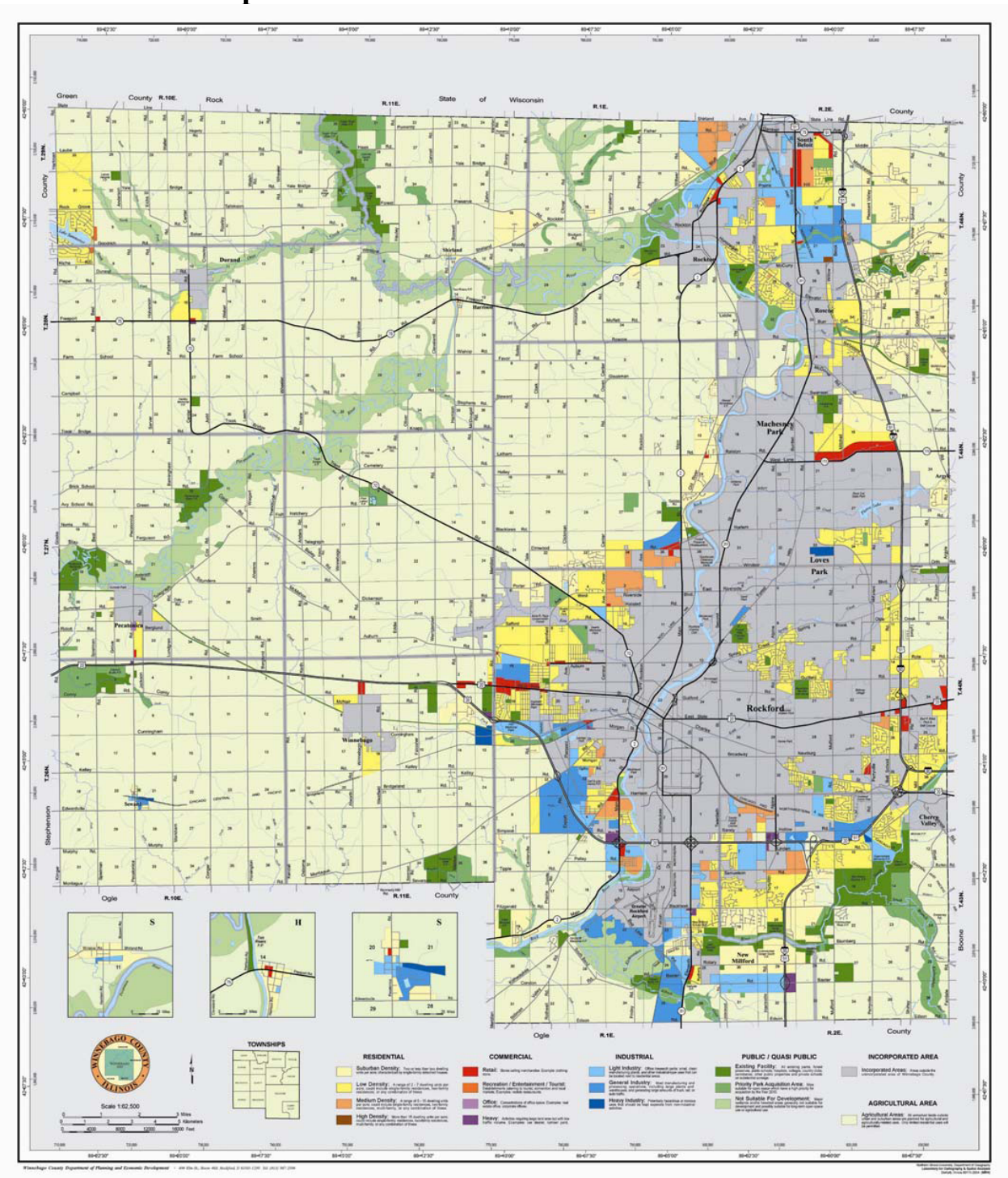
Winnebago County Land Use Maps

Appendix H: Winnebago County Land Use Maps

Current Land Use Map



2010 Land Use Map



Appendix I

Capability Assessment Tables

Community / Jurisdiction	Existing Resources																				
	GIS Capability	HAZUS Capability	Zoning Maps	Existing Land Use Maps	Proposed Land Use Maps	Highway Maps	Infrastructure Maps	Soil Maps	Assessor's Property Index Maps	Street Centerline Maps	Aerial Maps	Topographic Maps	Subdivision Maps	NFIP Maps	Wetland Maps	NFIP Elevation Certificates	Critical Facilities Map	Post-Disaster Mitigation Policies and Procedures	Repetitive Loss List	Flood Insurance Claim List	Other
Village of Cherry Valley	X		X	X	X	X	X	X		X	X	X	X		X	X	X			X	X
Village of Durand	X		X	X		X	X		X	X	X	X	X	X							
City of Loves Park	X		X	X	X	X	X	X	X		X	X	X	X	X	X	X				
Village of Machesney Park	X		X		X	X	X	X	X	X	X	X	X	X		X			X		
Village of New Millford			X	X		X		X					X								
Village of Pecatonica			X	X						X			X								
City of Rockford	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X
Village of Rockton																					
Village of Roscoe	X		X		X	X	X	X	X	X	X	X	X	X							
City of South Beloit	X		X	X		X	X		X	X	X	X	X	X		X					
Village of Winnebago	X		X	X	X	X			X				X								
Winnebago County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	

Community / Jurisdiction	Existing Plans									Existing Ordinances					
	Comprehensive Plan	Storm water Management Plan	Flood Mitigation Assistance Plan	Capital Improvement Plan	Land-Use Plan	CRS Plan	Emergency Management Plan	Habitat Conservation Plan	Other	Zoning Ordinances	Subdivision Ordinance	Historical Preservation Ordinance	Building Code	Drainage Ordinance	Other
Village of Cherry Valley	X	X		X	X		X		X	X	X		X	X	X
Village of Durand	X	X		X			X			X	X		X	X	
City of Loves Park	X	X		X	X		X			X	X		X	X	
Village of Machesney Park	X									X	X		X	X	
Village of New Millford		X			X		X			X	X			X	
Village of Pecatonica	X				X					X			X		
City of Rockford	X	X	X	X	X		X		X	X	X	X	X	X	X
Village of Rockton															
Village of Roscoe	X	X		X	X					X	X		X	X	
City of South Beloit	X	X	X		X		X			X	X		X	X	
Village of Winnebago	X				X		X			X	X		X		
Winnebago County	X		X	X	X		X			X	X		X	X	

Appendix J

Mitigation Action Plan

Winnebago County's Action Plan

Mitigation Goals:

Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
Goal 3: Reduce physical / structural damages from natural hazards
Goal 4: Minimize the loss of utilities during hazards.
Goal 5- Increase community awareness, education and understanding of natural hazards and mitigation
Goal 6: Enhance existing GIS and other technical data
Goal 7: Strengthen relationships between separate units of government, businesses and the general public

Winnebago County's Multi-Jurisdictional Mitigation Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Increase structural resistance from seismic, wind, snow, etc by enforcing building codes	Building and Zoning Department	ongoing	General Funds and Permit Fees	B	PA	3	High/Medium	New and Existing Structures
ALL HAZARDS	Maintain critical avenues of communication	IEMA, IEPA, FEMA, Winnebago County	TBD (when funding is available)	State, Federal, and Local funding	B	PA	4,5	High/Low	N/A
ALL HAZARDS	Disseminate public notification and information on hazards	Telephone and Cell Phone Companies and Media	ongoing	State, Federal, and Local funding	C	PI	1,2,5	High/Low	N/A
ALL HAZARDS	Provide critical services from transportation, health services, law enforcement, and other protective services	Winnebago County Highway Department	ongoing	Annual operating budget, IEMA, and FEMA	B	ES	1,2,4	High/High	N/A
ALL HAZARDS	Maintain and promote ingress and egress routes	Winnebago County Highway Department	ongoing	Annual operating budget, IEMA, and FEMA	B	ES	1,2,5	High/High	N/A
ALL HAZARDS	Conduct an assessment of susceptibility	ESDA, IEMA, and FEMA	ongoing	Annual operating budget	B	PA	1,2,5	High/Medium	New and Existing Structures
ALL HAZARDS	Maintain facilities that optimize survivability and or reduce loss	Winnebago County Highway Department	ongoing	Annual operating budget	B	PA	1,2,4	High/High	Existing Structures
ALL HAZARDS	Protect critical resources and services	Winnebago County Highway Department	ongoing	Annual operating budget	B	PA	1,2,4,7	High/High	N/A
ALL HAZARDS	Develop post-development storm water controls to maximize infiltration	Winnebago County Highway Department and Winnebago County Building and Zoning Department	2008/2009	Minimal operating budget impact	B	SP	1,2,4	High/Medium	N/A
ALL HAZARDS	Continue providing community outreach by reviewing emergency plans for pulbic and private facilities and public speaking events (Emergency Services Director)	ESDA	ongoing	None	C	PI	5	High/Low	N/A

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Host yearly public severe weather training	NWS, Winnebago County ESDA	Yearly	None	C	PI	5	High/Low	N/A
ALL HAZARDS	Operate the Integrated Emergency Management Committee (IEMC) promoting information sharing and relationship building among police, fire, emergency management, public facilities, hospitals, schools, non-profit, and State agencies	ARC, Salvation Army, WC ESDA, Rock River water Reclamation District, North Park Public Water District, all local hospitals, all law enforcement departments within Winnebago County, all fire protection districts and fire departments within Winnebaco County, IEMA, Center for sight and hearing, Winnebago County Health department, Veteran's Administration, Regional Office of Eduction and more	regular meetings	None	B	PI	5	High/Low	N/A
ALL HAZARDS	Coordinate emergency vehicle routes in consideration of snowplow movement, transportation of other personnel (medical, police, communications, emergency servicecs, etc)	Winnebago County Highway Department, WC ESDA	2008	Winnebago County Highway Department, WC ESDA	B	PA	1,2,7	High/Low	N/A
ALL HAZARDS	Install adequate outdoor warning devices to cover all of Winnebago County	Winnebago County (including all cities and villages)	TBD (when funding is available)	State, Federal, and Local funding	B	PA	1,2,5	High/High	N/A
ALL HAZARDS	Promote more stringent building codes and retrofitting of critical facilities	Winnebago County	2008	Winnebago County	B	PA	1,2,3	High/Low	New and Existing Structures
DROUGHT	Maintain adequate water supply thru public information / education outreach	Winnebago County, Public Works	ongoing	TBD	C	PI	1,5	High/Low	N/A
DROUGHT	Recharge groundwater areas by reducing excess water run-off	Winnebago County	ongoing	TBD	D	PA	4	High/Medium	N/A
DROUGHT	Modify storm water detention areas by imporving storage time	Winnebago County, Public Works	ongoing	TBD	D	SP	1,3,4	High/High	Existing Structures
DROUGHT, FLOODING, SEVERE STORMS	Install and operate streamgages for monitoring water levels	Winnebago County ESDA, Winnebago County Sheriff's Office, USGS, Army Corp of Engineers, NWS, Commonwealth Edison	Installed 2002, ongoing	Commonwealth Edison, Winnebago County Sheriff's Office, USGS, Army Corp of Engineers, Winnebago County Highway Department,	B	SP	1,2,4,5,6	High/Medium	New Structures

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-7	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
				State Grants					
FLOODING	Maintain drainage systems with isolated maintenance programs	Rock River Water Reclamation	ongoing	TBD	B	SP	1,2	High/Medium	Existing Structures
FLOODING	Continue to participate in the National Flood Insurance Program	Rock River Water Reclamation, FEMA, IDNR	ongoing	TBD	B	PA	1,2,3	High/Low	N/A
FLOODING	Prevent/strictly control construction of structures within the floodplain; comply with Winnebago County Surface Water Management Ordinance	Couty Highway Department, Building/Zoning Departments, Health Department, Soil and Water Conservation District	ongoing	Highway Funds, General Funds	B	PA	1,2,3	High/Low	New Structures
FLOODING	Implement and further expand maintenance programs for drainage systems	Winnebago County	ongoing	TBD	B	SP	1,2,3	High/Medium	Existing Structures
FLOODING	Improve capacity of drainage systems county-wide	Winnebago County	TBD (when funding is available)	TBD	B	SP	1,2,3	High/High	Existing Structures
FLOODING	Construct or improve storm water drainage and management facilities	IEMA, IEPA, FEMA, Winnebago County Highway Dept	TBD (when funding is available)	State, Federal, and Local funding	B	SP	1,3,4	High/High	New and Existing Structures
FLOODING	Floodproof homes in the floodplains	WC ESDA, FEMA	TBD (when funding is available)	FEMA Grants, Federal, State and Local Grants	B	PP	1,2,3	High/High	New and Existing Structures
FLOODING	Promote NFIP to businesses and homeowners in Winnebago County	WC ESDA	ongoing	None	C	PA	1,2,3	High/Low	New and Existing Structures
FLOODING and SEVERE STORMS	Continue to maintain the two sandbaggers and sandbagging equipment to keep on hand for emergency use	ESDA, Winnebago County Sheriff's office, Harlem Township	ongoing	Winnebago County	B	PA	1,2,3	High/Medium	N/A
SEVERE STORMS, SEVERE WINTER STORMS, TORNADOES	Utilize Amateur Radio Emergency Services (ARES) and storm spotters	Winnebago County ESDA, ARES	ongoing	None	B	PA	1,2,5	High/Low	N/A

Village of Cherry Valley's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards

Goal 2: Minimize the loss of property and damage due to hazards

Village of Cherry Valley's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-2	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce soil erosion control on all new developments	Cherry Valley Public Works Department	ongoing/ as needed	TBD	D	PA	1,2	Medium/Low	New Structures
FLOODING, SEVERE STORMS, SEVERE WINTER STORMS	Maintain storm water outlets and inlets	Cherry Valley Public Works Department	ongoing/ as needed	TBD	B	SP	1,2	High/Medium	Existing Structures
FLOODING	Comply/ enforce floodplain building code restrictions	Cherry Valley Engineering	as needed	TBD	B	PA	1,2	High/Low	New and Existing Structures
FLOODING	Reduce effects of flooding by clearing creeks of debris and sending violation letters to property owners with obstructions	Cherry Valley Public Works Department	Yearly	TBD	B	PA	1,2	High/Medium	N/A
FLOODING	Modify/maintain Regional Detention Pond south of VanDiver Road	Village of Cherry Valley	2008	TBD	B	SP	1,2	High/High	Existing Structures

Village of Durand's Action Plan

Mitigation Goals:

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Minimize the loss of property and damage due to hazards
Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation
Goal 4: Enhance existing public services and response time to hazards

Village of Durand's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Collect and assemble critical facilities building locations	Village of Durand	ongoing	TBD	B	PA	1,3,4	High/Low	N/A
ALL HAZARDS	Minimize the loss of power/utilities; develop cross information management	Fire Department, Police Department, EDSA, ComEd	2008	General Funds	B	PA	4	High/High	N/A
ALL HAZARDS	Collect and assemble building values for critical facilities	TBD	TBD	General Funds	B	PA	3,4	High/Low	N/A
ALL HAZARDS	Establish an Emergency Response Assessment Team which will assess types of damage, number or damaged buildings, and dollar amounts	TBD	2008	TBD	B	PA	3,4	High/Low	N/A
DROUGHT	Educate/notify public on water restrictions and drought	DPW	2007	TBD	C	PI	3	High/Low	N/A
DROUGHT	Pass and Install further ordinances for reduction in fresh water waste	DPW	2008	TBD	D	PA	3,4	High/Low	N/A
EXTREME HEAT	Partner with local non-profit organizations to establish cooling centers	Police Department, Fire Department, EC	2008	TBD	D	SP	1,4	High/Medium	New Structures
FLOODING	Prevent buildings from being built in the current floodplains by enforcing floodplain ordinance regulations	Village of Durand	ongoing	TBD	B	PA	1,2	High/Low	New Structures
FLOODING	FWEEPs (Flood warning and emergency evacuation plans): List all locations for evacuation upon possibility of dam bursting	Police Department, Fire Department, ESDA	2008	General Funds, Winnebago County	A	PA	1,3,4	High/Low	N/A
SEVERE STORM and TORNADOES	Monitor, test, and utilize local outdoor warning system	Fire Department	ongoing	Fire Department, General Funds, Winenbago County	B	PA	1,3,4	High/Low	New and Existing Structures

Village of Durand's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
SEVERE STORM and TORNADOES	Encourage and promote safe rooms, especially in new construction	Insurance Companies, Builders	2009	TBD	C	PA	1,3	High/Low	New Structures
SEVERE WINTER STORMS	Clear road of snow and ice following winter storm event	DPW	ongoing	Winnebago County	B	PA	1,4	High/High	N/A

City of Loves Park's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Minimize the loss of property and damage due to hazards
Goal 3: Strengthen relationships between separate units of government
Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
Goal 5: Build on existing GIS capabilities in Winnebago County
Goal 6: Minimize the loss of utilities during hazards.

City of Loves Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-6	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce existing City codes and ordinances such as development, building, and flood control	Loves Park	ongoing	Local	B	PA	1,2,3,6	High/Low	New Structures
ALL HAZARDS	Strengthen GIS Database with Hazard Data	Loves Park, WinGIS	ongoing	Local	D	PA	3,5	High/Low	N/A
ALL HAZARDS	Increase and strengthen police and fire outreach, eduction, and prevention programs	Loves Park Police and Fire Department	ongoing	Local	C	PI	4	High/Low	N/A
ALL HAZARDS	Monitor, test, and utilize warning siren system	Loves Park	ongoing	Local	B	PA	4	High/Low	N/A
DROUGHT	Improve utility company communication to customers during periods of water usage restrictions	Loves Park Public Works / Media	as needed per event	Local	C	PI	4,6	High/Low	N/A
FLOODING	Monitor and maintain existing streams and channels within Loves Park	Loves Park, USACE	ongoing	Local	B	SP	1,2	High/High	New and Existing Structures
FLOODING	Develop a study and implement improvements to the Howard Creek Drainage Basin	Loves Park/ Landowners	2008	Local- TIF, General	B	SP	1,2	High/Medium	New and Existing Structures
FLOODING	Develop and monitor a repetitive loss list and incorporate into a GIS	Loves Park, WinGIS	ongoing	Local	B	PA	1,2,5	High/High	N/A
SEVERE WINTER STORM	Develop regional salt storage facilities in the area	Loves Park, Winnebago County	ongoing	Local	B	SP	1	High/Medium	New Structures
SEVERE WINTER STORM, SEVERE STORM	Develop regulations to require below-grade utility installations in new development	Loves Park, Utilities	ongoing	Local	B	PA	2,6	High/High	New Structures

Village of Machesney Park's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Minimize the loss of property and damage due to hazards
Goal 3: Enhance existing public services and response time to hazards
Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
Goal 5: Minimize the loss of utilities to hazards

Village of Machesney Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Enforce building code review and inspection	Winnebago County, State of Illinois	ongoing	Permit Fees	B	PA	1,2	High/Low	New and Existing Structures
ALL HAZARDS	Conduct yearly "right of way" tree trimming	IHDA	Yearly	IHDA, General Funds	D	PA	2,5	Medium/Low	New and Existing Structures
ALL HAZARDS	Improve low-income residential structures to meet minimum health and safety standards	IHDA	Yearly	IHDA, General Funds	B	PP	1,2,3	High/Medium	New and Existing Structures
ALL HAZARDS	Establish policy which coordinates Village, Winnebago County, fire and utility provider response to natural hazards	Winnebago County, Fire Department, North Park Water, Rock River Water	2008	General Funds, Grants	B	PA	1,3	High/Low	N/A
ALL HAZARDS	Increase community awareness, education, and understanding of natural hazards	Village of Machesney Park, Utilities, Public Works	2008	General Funds, Grants	C	PI	4	High/Low	N/A
DROUGHT	Establish policy coordinating Village and North Park Water response to drought	North Park Public Water	2008-2009	General Funds, Grants	D	PA	1,3	High/Medium	N/A
EXTREME HEAT	Open cooling centers at Village Hall to public during high heat events	Village Hall	as needed	General Funds	D	ES	1,3	High/Low	Existing Structures
EXTREME HEAT	Establish formal policy for cooling centers and coordinate with other governmental agencies to help reduce heat related health issues	Other governmental agencies	2008-2009	General Funds, Grants	D	ES	1,3	High/Medium	Existing Structures
FLOODING	Reduce the number of properties at risk for flooding; Comply with Flood Hazard and Storm Water ordinances	FEMA/ IDNR	ongoing	Permit Fees, General Funds	B	PA	2	High/High	New and Existing Structures
FLOODING	Provide sand bag materials to public during	Harlem Township	as needed	General Funds	B	ES	1,2,3	High/Medium	Existing Structures

Village of Machesney Park's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	flooding events								
FLOODING	Aquire property located within the NFIP designated floodway	FEMA/ IDNR	2008-2010	FEMA, Grants, General Funds	A	PP	1,2	High/High	Existing Structures
SEVERE WINTER STORM	Clear roads of ice and snow and salt roads during a winter storm event	Winnebago County	as needed	General Funds	A	ES	1,3	High/High	N/A

Village of New Millford's Action Plan

Mitigation Goals

Goal 1: Reduce the life threatening effects of natural hazards on local populations (injuries / death)

Village of New Millford's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Purchase and Implement warning siren system	New Millford	2008-2010	Local / HMGP	A	PA	1	High/ Medium	N/A

Village of Pecatonica's Action Plan

Mitigation Goals

Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
Goal 3: Reduce physical / structural damages from natural hazards
Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation
Goal 5: Minimize the loss of utilities during hazards
Goal 6: Aid citizens in essential services

Village of Pecatonica's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-6	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Have arborist inspect, trim, and remove dead or damaged trees	Public Works / Citizens	ongoing	General Funds	D	PA	1,3,5	High/Low	New and Existing Structures
ALL HAZARDS	Buy an Emergency generator for water pump at well #1 & #2	Public Works, PDC	ongoing	General Funds / HMGP	A	PA	1,6	High/Medium	N/A
ALL HAZARDS	Buy a PIO drive for pump at well #1	Public Works, Local Farmers	ongoing	General Funds	B	PA	1,6	High/Medium	N/A
ALL HAZARDS	Buy Emergency generator for Police Department and Village Hall	Police Department, Village Hall	2008	HMGP	A	PA	1,2,5,6	High/Medium	Existing Structure
DROUGHT	Reduce risk to private well users by having water utility notify local authority of the drought	Public Works, Police Department, Media	ongoing	General Funds	C	PI	1,3,5,6	High/Low	N/A
DROUGHT	Partnership with Freeport for safe water delivery	VOP/Freeport	ongoing	General Funds	D	ES	1,6	Medium/Medium	N/A
EXTREME HEAT	Notify citizens of cooling center locations and offerings	Village Hall, Police Department, Public Works, Churches	ongoing	General Funds	C	PI	1,2,6	High/Low	N/A
SEVERE STORMS, TORNADOES, SEVERE WINTER STORMS	Install and maintain alarm systems	Police Department, Fire Department	2008	General Funds	B	PA	1,2,4	High/Medium	N/A
SEVERE STORMS, TORNADOES, SEVERE WINTER STORMS	Alert local citizens of hazards via media	Media	ongoing	TBD	C	P	1,2,4	High/Low	N/A

City of Rockford's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Minimize the loss of property and damage due to hazards
Goal 3: Increase community awareness, education, and understanding of natural hazards and mitigation
Goal 4: Encourage future policies and enforce current policies, procedures, and documents to reduce risk

City of Rockford's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Follow load restrictions on building design, fire suppression requirements, and electrical/plumbing regulations	Building and Fire Departments	Ongoing	Fees and Property Taxes	D	PA	1,2,4	High/High	New and Existing Structures
ALL HAZARDS	Follow in place Plans/Procedures/Contacts / Strategies for hazard situations	All Departments; Salvation Army; Red Cross; Hospitals; IEMA; EMTD; County Sheriff	Ongoing	FEMA Grant	B	PA	1,4	High/High	N/A
ALL HAZARDS	Promote Smart Growth by transitioning to Rail Plan, pedestrian path plan, population household forecasting and commuter patters	RATS; Public Works Department	Ongoing	IDOT and Federal Grants Metropolitan Planning Organization	D	PA	4	High/Low	New Structures
ALL HAZARDS	Develop public service announcements and educational material for each hazard	All City Departments, IEMA	2008-2009	Property Taxes, State Funds	C	PI	1,2,3	Medium/Low	N/A
ALL HAZARDS	Develop a community rating system	Public Works, Building and Comm. Dev. Departments	2008	Sales Tax	B	PA	3	High/Low	N/A
ALL HAZARDS	Accredidation of Fire Department	All City Departments	2008	Property Taxes	D	PA	3,4	High/Low	Existing Structures
ALL HAZARDS	Accredidation of Public Works	Public Works Department	2008-2012	Property Taxes	D	PA	3,4	High/Low	Existing Structures
DROUGHT	Restrict water usage during drought	Public Works department	Ongoing	Water Division	B	PA	1,3	High/Low	N/A
DROUGHT	Complete the $75 mil. Water Rehabilitation Program	Public Works	2008-2010	Water Billing	B	SP	1,2	High/High	New Structures
FLOODING	Enforce regulations, floodplain and detention requirements, and Clean Water Act	Building and Public Works	Ongoing	Fees and Property Taxes	B	PA	1,2,3	High/Medium	New and Existing Structures
FLOODING	Map repetitive loss and substantially damaged properties	Public Works, Building and Human Services Department	Ongoing	IEMA, Property and Sales Tax	B	PA	1,2,3	High/Low	New and Existing Structures
FLOODING	Map priority acquisition and unsuitable for development areas	Community Development, Public Works Department, Rockford Area Economic Development Council,	Ongoing	Property Taxes	B	PA	1,2,3	High/Low	N/A

City of Rockford's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
		RRWRD, Rockford Park District, Winn City Forest Pres.							
FLOODING	Floodproof, Relocate, Elevate, and Demolish at risk structures	Public Works, Human Services, Building, IEMA, FEMA	2008	Sales Tax, Property Tax, State and Federal Grants	A	PP	1,2	High/High	New and Existing Structures
FLOODING	Alpine Dam and Keith Creek Modernization	Public Works Department, State and Federal Governments, United States Corp of Engineers	2008-2010	Sales Tax, State and Federal Funds	A	SP	1,2	High/High	New and Existing Structures
FLOODING and DROUGHT	Enforce landscaping and buffer requirements, open space requirements, impervious ratio requirements, Rock River and Well Head Setback Overlay Districts	Community Development/Public Works	Ongoing	Fees and Property Taxes	B	PA	4	High/High	New and Existing Structures
FLOODING and DROUGHT	Enforce engineering design standards	Public Works department	Existing/ Under Revision	Property Taxes	B	PA	2,4	High/Low	New and Existing Structures
FLOODING and DROUGHT	Enforce flood mitigation, flood control, stormwater management, planning and $75 mil Water Rehabilitation Projects	Public Works department	Ongoing	Water Billing; Sales Tax, MFT Funds; State/Federal Grants	A	SP	2,4	High/High	New and Existing Structures
SEVERE WINTER STORMS	Follow parking restriction; allow arterial/residential plow routes; follow plowing/salting policies	Public Works	Ongoing	Property Taxes	B	PA	3,4	High/Low	N/A
SEVERE WINTER STORMS, SEVERE STORMS, TORNADOES	Enforce tree and bush trimming/pruning requirements/ planting and removal requirements	Public Works department	Ongoing	Property Taxes	C	PA	2,3,4	Medium/Medium	N/A

Village of Rockton's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Minimize the loss of property and damage due to hazards
Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation

Village of Rockton's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-3	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Monitor, test, and utilize warning siren system	Village of Rockton	Ongoing	Local	A	PA	1,3	High/Low	N/A
ALL HAZARDS	Create rapid response teams for down electrical lines, trees, etc	Village of Rockton, Public Works, Police Department, Fire Department	2007-2009	Local	A	PA	1,2	Medium/Low	N/A
ALL HAZARDS	Creat traffic flow paths for Emergency Vehicles during or after a natural hazard	Village of Rockton, Police Department, Fire Department	2007-2009	Local	A	PA	1,3	High/Low	N/A
EARTHQUAKES	Shelter/House survival supplies and backup power supplies	Village of Rockton	Ongoing	Local	D	PA	1	Medium/Low	N/A
EXTREME HEAT	Designate Cool Zone Shelters	Village of Rockton	2007-2009	Local	D	ES	1	High/Medium	N/A
FLOODING	Prohibit building in the floodplain; Comply with NFIP Building Standards	Village of Rockton	Ongoing	Local	B	PA	1,2	High/Low	New Structures

Village of Roscoe's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury that could be caused by natural hazards.
Goal 2: Minimize the loss of property
Goal 3: Increase community awareness, education and understanding of natural hazards and mitigation
Goal 4: Aid citizens in essential services

Village of Roscoe's Action Plan and Mitigation Goals

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Construct an emergency shelter to use to distribute water, food, sanitation products, etc; Use as a cooling center also	Fire Department	2007-2008 (ASAP)	General Funds, State and Federal Funding	A	PA	1,4	High/Medium	N/A
ALL HAZARDS	Improve roads, public water, and sewer to withstand natural hazards	Capital Improvement Committee	ongoing	General Funds and NPPWD	B	SP	4	High/High	New and Existing Structures
DROUGHT	Construct public water system to reduce the number of residents using shallow wells	North Park Public Water District	ongoing	General Funds, State and Federal Funding	A	SP	1,2,4	High/High	N/A
EARTHQUAKE	Increase public awareness by creating earthquake preparedness brochures and flyers and by public outreach	Local Township	2007-2008 (ASAP)	General Funds, State and Federal Funding	C	PI	1,3	Medium/Low	N/A
FLOODING	Continue to participate in the National Flood Insurance Program	FEMA, IDNR	ongoing	General Funds, State and Federal Funding	B	PA	1,2	High/Low	New and Existing Structures
FLOODING	Control Stormwater run off	Developers	ongoing	Developers	B	SP	1,2	High/Medium	N/A
FLOODING	Prevent construction of structures within the floodplain	Floodplain Administrator (Mayor or Village Trustee)	ongoing	General Funds	B	PA	1,2	High/Low	New Structures
SEVERE STORM, SEVERE WINTER STORM, TORNADO	Require all utilities to be burried underground	Utility Companies (Com Ed, AT&T, Verizon, Rock Co. Co-op, cablevision)	ongoing	General Funds, State and Federal Funding	B	PA	1,2	High/High	N/A
SEVERE STORM, TORNADOES	Install sirens in the outer areas of the village	Fire Department, Fire Districts, ESDA	2007-2008	General Funds, Homeland Security Grant	A	PA	1	High/Medium	N/A
SEVERE WINTER STORMS	Create multiple centers for salt and sand to be stored for Municipal trucks to use during Severe Winter Storms	County and Township Highway Department, Department of Transportation	2007-2010	General Funds, State and Federal Funding	B	SP	1,2	High/Medium	New Structures

City of South Beloit's Action Plan

Mitigation Goals

Goal 1: Reduce the non-life threatening effects of natural hazards on local populations
Goal 2: Reduce the life threatening effects of natural hazards on local populations (injuries / death)
Goal 3: Reduce physical / structural damages from natural hazards
Goal 4: Increase community awareness, education and understanding of natural hazards and mitigation

City of South Beloit's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
ALL HAZARDS	Buy a backup generator that will be placed in the Emergency Center at the Fire Station	Fire Department	2010	General Funds	B	PA	1,2	High/Medium	Existing Structures
ALL HAZARDS	Create Emergency Center at Fire Station	Fire Department	2007 - 2010	General Funds and Association Funding	B	ES	1,2	High/Medium	Existing Structures
DROUGHT	Reduce risk to private well users by reducing unnecessary water consumption in the area	Illinois American Water / Community website	As needed based on weather	Customer Billing	D	PA	1,3	High/Low	N/A
DROUGHT	Reduce risk to private well users by having water utility notify local authority of the drought	Utility Company	ongoing	TBD	D	PI	1,3,4	High/Low	N/A
FLOODING	Reduce effects of flooding by clearing creeks of debris	Public Works	1 per year.	Public Works General Funds	B	SP	1,2,3	High/Medium	New and Existing Structures
FLOODING	Develop ordinance to require trestle bridges structural integrity checked for flooding	Public Works / Railroads	2010	Public Works General Funds	B	PA	1,2,3	Medium/Medium	New and Existing Structures
SEVERE STORM/ EXTREME HEAT/ EARTHQUAKE/ SEVERE WINTER STORMS	Alert local area via Media outlets of hazardous weather or conditions	Media	2007	TBD	C	PI	1,2,4	High/Low	N/A
SEVERE STORM/ SEVERE WINTER STORMS/ TORNADOES	Install new alarm systems	Fire Department	2007, 2008	General Funds and Homeland Security Grant	B	PA	1,2	High/Medium	N/A
SEVERE STORM/ TORNADOES/ SEVERE WINTER STORMS	Clear roadways of debris, snow, etc post-hazard	Public Works	As needed based on weather	General Funds	B	ES	1,2	High/High	N/A
TORNADO	Reduce loss of life by providing local tornado shelters in city buildings	Fire Department Chief	2007 - 2012	FEMA HMGP	D	ES/PA	1,2	High/Medium	Existing Structures
TORNADO	Make city buildings (i.e. Library, Community Center, Fire Department, Schools, City Hall, etc) compliant with structural	Fire Department and City Council	2007 - 2012	FEMA Mitigation Funds	D	PA	1,2,3	High/Medium	New and Existing Structures

City of South Beloit's Action Plan

HAZARD	TYPE OF ACTIVITY OR PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1-4	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
	codes in order to withstand high winds produced from Tornadoes								

Village of Winnebago's Action Plan

Mitigation Goals

Goal 1: Minimize the loss of life and injury due to hazards
Goal 2: Increase community awareness, education, and understanding of natural hazards and mitigation
Goal 3: Minimize the loss of property and damage due to hazards

Village of Winnebago's Action Plan

HAZARD	TYPE OF ACTIVITY OF PROJECT	LEAD IMPLEMENTER/ CONTACT	PROPOSED SCHEDULE	FUNDING/BUDGET CONSIDERATIONS	PRIORITY	ACTIVITY CATEGORIZATION	MATCHES GOALS 1- 2	BENEFIT/ COST	ACTIVITY REDUCES EFFECTS ON NEW OR EXISTING STRUCTURES
SEVERE STORMS	Alert local citizens of hazards via the media	Village of Winnebago	As needed based on weather	Local, Media	C	PI	1,2	High/Low	N/A
ALL HAZARDS	Monitor, test, and utilize warning siren system	Village of Winnebago	Yearly	Local	C	PA	1,2	High/Low	Existing Structures
SEVERE STORMS, SEVERE WINTER STORMS, TORNADOES	Clear roadways of debris, snow, etc post-hazard	Public Works, County Highway Department	As needed based on weather	Local, County	B	ES	1	High/High	N/A
ALL HAZARDS	Provide critical services from transportation, health services, law enforcement, etc to aid after a hazard has occurred	Winnebago County	Ongoing	Local, County operating budget, IEMA, FEMA	B	ES	1	High/High	N/A
FLOODING	Encourage floodproofing practices and codes to those structures located near streams or prone flash flooding areas	Village of Winnebago	2007-2012	County, IEMA, FEMA	B	PA/PP	1,3	High/Medium	New and Existing Structures