

CHAMPAIGN COUNTY



Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan

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Acronyms

ASCE	American Society of Civil Engineers
CDP	Census Designated Place
DMA 2000	Disaster Management Act of 2000
ECIEDD	East Central Illinois Economic Development District
EMA	Emergency Management Agency
EMTs	Emergency Medical Technicians
EMTPs	Emergency Medical Technicians Paramedics
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FPD	Fire Protection District
FSRS	Fire Suppression Rating Schedule
HMGP	Hazard Mitigation Grant Program
HMP	Champaign County Multi-Jurisdictional Hazard Mitigation Plan
IEMA	Illinois Emergency Management Agency
INHMP	Illinois Natural Hazard Mitigation Plan
ICC	International Code Council
ISO	Insurance Services Office
LRMP	Champaign County Land Resource Management Plan
MSA	Metropolitan Statistical Area
NCDC	National Climatic Data Center
NMSZ	New Madrid Seismic Zone
NOAA	National Oceanic and Atmospheric Administration
NWS	National Weather Service
OMB	Office of Management and Budget
PDSI	Palmer Drought Severity Index
RPC	Champaign County Regional Planning Commission
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic and Environmental
UIUC	University of Illinois at Urbana-Champaign
USGS	United States Geological Survey
WVSZ	Wabash Valley Seismic Zone

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Executive Summary

Purpose

The Champaign County Hazard Mitigation Plan (HMP) is intended to meet the planning requirements established in Section 104 of the *Disaster Mitigation Act of 2000* (42 USC 5165) and 44 CFR Part 201. The *Disaster Mitigation Act of 2000* (DMA 2000) encourages planning for disasters before they occur. DMA 2000 is administered by the Federal Emergency Management Agency (FEMA). An approved local mitigation plan that addresses the specific natural hazard threats to local jurisdictions makes jurisdictions eligible to apply for mitigation funding through these FEMA programs:

- Pre-Disaster Mitigation Program
- Hazard Mitigation Grant Program
- Flood Mitigation Assistance

Scope

The Champaign County Natural Hazard Mitigation Plan identifies local hazard mitigation goals and objectives, and specific hazard mitigation actions to implement over the long term that will result in reduction in risk and potential for future losses associated with the occurrence of natural hazards.

The plan was developed to be useful to each participating jurisdiction. The Plan can be used to facilitate an increased awareness of potential natural hazards and a better understanding of potential losses from natural hazard events.

The development and ultimate adoption of the Plan by each jurisdiction identifies and prioritizes mitigation actions that can occur in each jurisdiction, in advance, to reduce or eliminate long-term risk to life and property from potential natural hazard events.

Planning Process

The HMP development process included four major stages, with opportunities for public participation throughout: 1) organizing resources; 2) assessing risks; 3) developing the mitigation plan; and 4) implementing the plan and monitoring progress.

Each of the 24 municipal jurisdictions located wholly or partially within the County agreed to participate in development of a multi-jurisdictional HMP. The major higher education institutions in the County (University of Illinois at Urbana-Champaign and Parkland College) also agreed to participate in developing the HMP. In total 27 jurisdictions, including the County, participated in developing the HMP.

A 'combination' approach was used to represent all participating jurisdictions on the HMP Planning Team. This approach allowed for the direct representation of the seven largest populated jurisdictions and two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team. The combination approach allowed for the direct representation on the Planning Team of approximately 90 percent of the population of all participating jurisdictions.

A broad-based HMP Advisory Group was recruited to support the Planning Team in their review of the draft HMP document and to provide their additional input at key stages during the project. Advisory Group members recruited during the Organization Stage included representatives of

each school district in Champaign County, key area-wide public and private service providers, and selected government agency representatives.

Public Participation

Ongoing opportunities for public input were an essential component of the HMP development process. Efforts to inform the public and to allow for their effective participation in HMP decision-making included: initial publicizing of the HMP to representatives of all municipalities in the County; establishment of an interactive HMP website; public notice of Planning Team meetings; information displays and press releases about HMP development; conducting a public preference survey; and holding a public meeting.

Hazards Profiles

Based on the *Illinois Natural Hazards Mitigation Plan* natural hazard ratings for Champaign County, the Planning Team selected the following natural hazards to profile for the HMP planning area:

- Severe Storms (including: tornados, damaging lightening, and hail)
- Severe Winter Storms
- Floods
- Extreme Heat
- Drought
- Earthquakes

All jurisdictions in the HMP planning area are at risk for all of the natural hazards profiled in the HMP, except for one type of flooding, commonly referred to as 'riverine flooding' or 'overbank flooding', which is flooding that occurs when the waters rise above the normal water line and overflow the banks of a river, stream, or channel. The jurisdictions of Allerton, Broadlands, Gifford, Homer, Longview, Ludlow, Ogden, Pesotum, Philo, Savoy, Thomasboro and Tolono do not contain land that is within the 100-year flood plain. There is very little chance that normally dry areas within those jurisdictions will become inundated with water from riverine flooding that results in significant damage. However, these jurisdictions may experience less damaging flooding phenomena such as ponding or flash floods.

Assessing Vulnerability to Natural Hazards

The data collection and analysis methods used to assess the vulnerability of HMP planning area jurisdictions to the profiled natural hazards included:

- Inventorying categories of property that could potentially be damaged;
- Determining average cost per square foot and the replacement cost for potentially damaged structures;
- Considering potential damage caused by each type of hazard including a general description of the economic impacts; and
- Ranking the vulnerability to each threat by jurisdiction.

HAZUS software was used to assess HMP planning area vulnerability to earthquake and flood hazards (specifically, riverine flood hazard). Specific hazard event scenarios were analyzed with HAZUS to provide a more detailed vulnerability assessment. Additional information regarding the procedures followed in assessing vulnerability with HAZUS software for the riverine flood and earthquake hazards are available in Appendix 3.

The ranking of six natural hazards based on the vulnerability assessments for each hazard is indicated in the following table:

Ranking of Hazards Based on Vulnerability Assessment

Natural Hazard	Hazard Rank	Annual Probability	Property & Crop Damage	Safety Hazard	Critical Facility Vulnerability	Potential Economic Disruption	Jurisdictions Affected
Severe Storm	1	81% <i>47% Tornado</i> <i>62% Hail</i> <i>7% Damaging Lightning</i>	Moderate	High	High	Medium	All
Flood	2	67%	Major	Medium	Medium	Medium	<p>By Riverine Floods:</p> <ul style="list-style-type: none"> ▪ Unincorporated Champaign County ▪ Bondville ▪ Champaign ▪ Fisher ▪ Ivesdale ▪ Mahomet ▪ Rantoul ▪ Royal, ▪ Sadorus ▪ Sidney ▪ St. Joseph ▪ Urbana ▪ Parkland College ▪ UIUC <p>By Ponding and Flash Floods:</p> <p style="text-align: center;">All</p>
Severe Winter Storm	3	87%	Minor	High	Medium	Medium	All
Extreme Heat	4	-	Minor	High	Low	Low	All
Drought	5	-	Moderate	Low	Low	Medium	All
Earthquake	6	-	Minor	Low	Low	Low	All

- **Severe storms**, which include tornados, hail, and lightning, are the highest ranking natural hazard threat of the HMP. The large probability of severe storms, along with the potential threat to not only property, but the health and safety of the jurisdictions' citizens, make severe storms dangerous. The damage that occurs in a large severe storm tends to be more localized than a large flooding event, though tornados can damage property and cause injury across a large area.
- **Flooding** is the second highest ranking threat of the HMP. Although not all jurisdictions are threatened by riverine flooding, the frequency, high potential damage to property, and wide damage area of a flooding event make it a hazard which is likely to cause widespread, significant damage.
- **Severe winter storms** are the third ranking threat of the HMP. Severe winter storms can pose safety risks, particular associated with vehicular travel, because of the reduced visibility, and the slippery road conditions that they cause. Severe winterstorms not only have the capability of making travel dangerous, but can disrupt transportation altogether if roads become impassable. Ice storms can cause property damage and interruption of power service.
- **Extreme heat** is the fourth ranking threat of the HMP. Extreme heat is not usually associated with property damage, but poses serious health risks, especially to vulnerable populations. An extreme heat event is likely to affect the whole County, putting many people at a health risk.
- **Drought** is the fifth ranked hazard of the HMP. Droughts do threaten crops in the county. However, drought is ranked on the lower end of the hazards because it does not pose a significant threat to structures or critical facilities, nor does it pose a health and safety hazard.
- **Earthquake** is ranked last in the HMP. The lack of historical damage caused by earthquakes in Champaign County, and the modest damage that is predicted by the HAZUS model suggest that earthquakes are the hazard that are least likely to impact the HMP planning area.

The following key contains a description of categories used to rate overall vulnerability to natural hazards for each jurisdiction:

Key	na	Not a hazard to the jurisdiction
	L	Low Risk - little damage potential (e.g., minor damage to less than 5% of the jurisdiction)
	M	Medium Risk - moderate damage potential (e.g., causing partial damage to 5-10% of the jurisdiction; infrequent occurrence.
	H	Significant Risk - major damage potential (e.g., destructive, damage to more than 10% of the jurisdiction; regular occurrence.)

Using the above Key, a summary of vulnerability to natural hazards by jurisdiction is provided in the table below:

Summary of Vulnerability to Natural Hazards by Jurisdiction

Profiled Natural Hazards: ► Jurisdictions: ▼	Severe Storms includes Tornadoes, Hail, Damaging Lightning	Severe Winter Storms	Riverine Floods	Flash Floods or Ponding	Extreme Heat	Drought	Earthquake
Village of Allerton	H	H	na	L	M	L	L
Village of Bondville	H	H	M	L	M	L	L
Village of Broadlands	H	H	na	L	M	L	L
Unincorporated Champaign County	H	H	M	L	M	L	L
City of Champaign	H	H	M	L	M	L	L
Village of Fisher	H	H	M	L	M	L	L
Village of Foosland	H	H	na	L	M	L	L
Village of Gifford	H	H	na	L	M	L	L
Village of Homer	H	H	na	L	M	L	L
Village of Ivesdale	H	H	M	L	M	L	L
Village of Longview	H	H	na	L	M	L	L
Village of Ludlow	H	H	na	L	M	L	L
Village of Mahomet	H	H	M	L	M	L	L
Village of Ogden	H	H	na	L	M	L	L
Village of Pesotum	H	H	na	L	M	L	L
Village of Philo	H	H	na	L	M	L	L
Village of Rantoul	H	H	M	L	M	L	L
Village of Royal	H	H	M	L	M	L	L
Village of Sadorus	H	H	M	L	M	L	L
Village of Savoy	H	H	na	L	M	L	L
Village of Sidney	H	H	M	L	M	L	L
Village of St. Joseph	H	H	M	L	M	L	L
Village of Thomasboro	H	H	na	L	M	L	L
Village of Tolono	H	H	M	L	M	L	L
City of Urbana	H	H	M	L	M	L	L
University of Illinois at Urbana-Champaign	H	H	M	L	M	L	L
Parkland College	H	H	na	L	M	L	L

Developing Mitigation Strategy

Planning Team Members identified four goals that broadly describe the long-term ideals and intentions of the HMP and objectives for each goal, consistent with those of the current *State of Illinois Natural Hazard Mitigation Plan* and the adopted *City of Urbana Hazard Mitigation Plan*.

The HMP goals and accompanying objectives follow:

Goal 1. Minimize avoidable deaths and injuries due to natural hazards.	
Objectives	1-a Educate population regarding methods of protecting self and property from natural hazard impacts
	1-b Establish adequate warning systems.
	1-c Protect critical facilities and services from impacts of natural hazards.
	1-d Arrange for provision of storm shelters and cooling centers for population.
Goal 2. Protect existing and new infrastructure from impacts of natural hazards.	
Objectives	2-a Monitor condition of infrastructure for needed maintenance.
	2-b Ensure that water is available in the event of a drought.
Goal 3. Include natural hazard mitigation in local government plans and regulations.	
Objectives	3-a Improve the information base regarding vulnerability to impacts of natural hazards.
	3-b Review local programs and ordinances to determine how they can better address the impacts of natural hazards.
Goal 4. Coordinate natural hazard mitigation efforts of participating jurisdictions.	
Objective	4-a Update the multi-jurisdictional HMP every five years.

Specific Mitigation Actions For Each Hazard Planning Team members and HMP project staff reviewed a comprehensive range of specific mitigation actions for each hazard for each jurisdiction by reviewing groups of mitigation actions as identified by FEMA:

- preventive
- property protection
- natural resource protection
- structural projects
- public education and awareness

Mitigation Action Preference Survey The *Champaign County HMP Mitigation Measures Survey* was designed to gather public input about potential hazard mitigation actions. The survey was placed online at the HMP website (www.ccrpc.org/HMP) and paper copies of the survey were provided to the primary contact of each participating jurisdiction. The Survey was available online over an eight-week period, November 24, 2008 through January 16, 2009.

The survey contained 40 questions. Participants were asked to indicate whether they “strongly agree,” “agree,” “disagree,” or “strongly disagree” with a series of natural hazard mitigation actions. Fifty-seven responses to the survey were received. Respondents most preferred implementing public awareness and public education mitigation actions; actions to protect critical facilities; and adopting building codes to require safe rooms and other standards to strengthen structures to be wind resistant.

Mitigation Action Prioritization Method Planning Team members agreed to a prioritizing method that involved a 3-step analysis of each mitigation action. Each mitigation action was scored using the 3-step method, with each step yielding up to 14 points each. The maximum total score for any one mitigation action could be 42.

STEP 1. The first analysis is one that assesses an ‘action scope’ for the mitigation action. Up to 14 points were allocated based on which category fits the subject mitigation action. Members determined which level each mitigation action fit into to: Level 1, Level 2, or Level 3. Next, if the mitigation action was determined to be a Level 1 or a Level 2 action, points were assigned based on Planning Team members’ expertise and judgment as to the effectiveness of the mitigation action. Because Level 3 actions permanently eliminate or reduce property damages, injuries, or deaths in a specific area, Level 3 actions were assigned the highest amount of 14 points automatically.

A description of the ‘action scope’ levels and the points to be assigned to each ‘action scope’ level follows:

Level 1 Actions Potential Score: 1 to 14 points

- Eliminate or reduce property damages, injuries and deaths from less significant natural hazards; or
- Educate the public on disaster preparedness and mitigation related to the less significant natural hazards (e.g., drought, or earthquake)

Level 2 Actions Potential Score: 8 to 14 points

- Reduce property damages in a specific area; or
- Have the potential to reduce property damages, injuries and deaths across a wide area; or
- Educate the public on disaster preparedness and mitigation

Level 3 Actions Score: 14 points

- Permanently eliminate property damages and/or eliminate or reduce injuries and deaths in a specific area; or
- Have a high probability to systematically reduce property damages, injuries and deaths across a wide area.

STEP 2 Cost Effectiveness Rating Potential Score: 1 to 14 points

Members ranked each mitigation action qualitatively and subjectively, based on perceived cost-effectiveness of the mitigation action. In rating ‘cost-effectiveness’, a score of 14 points was possible, with lower scores denoting less cost-effectiveness and higher scores denoting greater cost-effectiveness.

STEP 3 Feasibility Rating: Potential Score: 1 to 14 points

Each action was assessed along 14 dimensions using a portion of FEMA’s STAPLEE framework. If the action was generally positive in a certain dimension, it was given a point. The total points available for feasibility range from 1 to 14.

Total Score A total score was assigned to each mitigation action based on the 3-step prioritization process described above.

Total Score: 0-27 = Priority 3
28-35 = Priority 2
36-42 = Priority 1

Mitigation actions receiving the highest scores were rated as a Priority 1; those receiving mid-range scores were rated as a Priority 2; and mitigation actions receiving the lowest range of scores were rated as Priority 3.

Hazard Mitigation Actions Prioritized by Jurisdiction Chapter 6 includes a table that lists hazard mitigation actions, as prioritized, for each participating jurisdiction. Included for each mitigation action is information about the party responsible for implementing the mitigation action, funding source, and a suggested timeframe for implementation.

Monitoring, Evaluating, and Updating the Plan

To remain eligible for mitigation project funding opportunities, a FEMA requirement is that the Champaign County HMP be reviewed and revised as necessary to reflect changes in development, progress in mitigation efforts, and changes in its priorities, and resubmitted for FEMA approval every five years.

Chapter 7 describes the HMP maintenance procedure. The Planning Team recommends that the HMP be reviewed on an annual basis beginning one year after FEMA acceptance. The annual review will facilitate a means of tracking and recording progress of participating jurisdictions toward implementation of mitigation efforts, and allow an opportunity for Planning Team members to evaluate opportunities to better coordinate mitigation actions across participating jurisdictions. The annual review schedule will enable an easier, more efficient five-year update.

Ongoing opportunities for public participation will remain an essential component of the HMP maintenance process. Efforts to inform the public and allow for public input as the HMP is reviewed and updated will include: continuation of the HMP website; public notice of future Planning Team meetings; release of public service announcements and press releases; and holding a public meeting prior to the end of the five-year HMP update cycle to review updated information, modifications, and proposed mitigation actions at that time.

Chapter 1 Introduction

mitigate: to cause to become less harsh or hostile, to make less severe or painful... *

hazard mitigation: any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards... **

What is Natural Hazard Mitigation Planning?

A definition of hazard mitigation offered by FEMA is “any sustained action to reduce or eliminate the long-term risk to human life and property from hazards.” ‘Natural’ hazard mitigation planning focuses specifically on natural, non-manmade hazards.

FEMA suggests that there are six broad categories of mitigation measures often included in hazard mitigation plans. The six categories, with examples of types of associated mitigation measures, are:

- **Prevention**
(e.g., planning and zoning, building codes, water management)
- **Property Protection**
(e.g., acquisition, retrofitting, insurance programs, flood proofing)
- **Public Education and Awareness**
(e.g., outreach projects, technical assistance, hazard information centers)
- **Natural Resource Protection**
(e.g., vegetative management, erosion and sediment control, wetlands preservation)
- **Emergency Services**
(e.g., hazard warning systems, emergency response, protection of critical facilities)
- **Structural Projects**
(e.g., improvements to stormwater infrastructure, dams, levees, or buttresses)

Jurisdictions with up-to-date hazard mitigation plans often benefit in these ways:

- the planning process leads to partnerships which can allow a variety of stakeholders to pool their resources, skills, and expertise;
- the planning process includes a systematic assessment of hazards and the prioritization of actions based upon cost analyses;
- funding priorities are well thought out and established in advance, enabling communities to quickly relate their needs to state and federal government when funds become available; and
- by reducing human-caused risk and better protecting each community for future generations, the sustainability of each community is increased.

* Source: Retrieved August 19, 2008, from <http://www.merriam-webster.com/dictionary/mitigate>

** Source: FEMA’s *Getting Started: Building Support for Mitigation Planning*

Purpose

The Champaign County Natural Hazard Mitigation Plan identifies community policies, actions and tools to implement over the long term that will result in reduction in risk and potential for future losses community-wide associated with the occurrence of natural hazards. The plan was developed to be useful to each participating jurisdiction. The Plan can be used to facilitate:

- an increased awareness of potential natural hazards; and a
- better understanding of potential losses from natural hazard events.

The development and ultimate adoption of the Plan by each jurisdiction identifies and prioritizes mitigation actions that can occur in each jurisdiction, in advance, to reduce or eliminate long-term risk to life and property from potential natural hazard events.

Scope

The Plan was developed to meet planning criteria of the *Disaster Mitigation Act of 2000*, and to achieve specific planning objectives established by the Federal Emergency Management Agency (FEMA), including:

- coordination among agencies;
- integration with other planning efforts & existing programs;
- state coordination of local mitigation planning;
- identify and profile all natural hazards;
- assess vulnerability & estimate potential losses;
- document planning process;
- assess capabilities of participating jurisdictions;
- develop hazard mitigation goals;
- identify and analyze mitigation measures;
- identify funding sources;
- adopt plan & implement mitigation measures;
- monitor, evaluate & update the Plan; and
- provide opportunities for continued public involvement.

Authority

The *Disaster Mitigation Act of 2000* (DMA 2000) is federal legislation that was signed into law on October 10, 2000. The aim of DMA 2000 is to encourage planning for disasters before they occur at both the state and local levels. FEMA administers DMA 2000.

In addition to introducing a new Pre-Disaster Mitigation Program (PDM), the Act created new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). After a disaster occurs, along with the money provided for recovery by FEMA, the HMGP provides funding for activities which will mitigate the impacts of future disasters. The PDM Program and Flood Mitigation Assistance (FMA) Program also fund mitigation activities.

Under Section 104 of DMA 2000 (42 USC 5165) a FEMA-approved mitigation plan is required in order for a jurisdiction to qualify for PDM, HMGP, and FMA funds. The FEMA requirements, introduced as the Interim Final Rule, were published in the Federal Register on February 26, 2002, at 44 CFR Parts 201 and 206. An approved mitigation plan must address the specific natural hazard threats to the participating jurisdictions to ensure the proper use of mitigation funding.

Local and State Hazard Mitigation Planning

1997 Champaign County Hazard Mitigation Plan The Champaign County Department of Planning & Zoning, in collaboration with the Champaign County Emergency Services & Disaster Agency, created the *Champaign County Hazard Mitigation Plan* in 1997. The plan focus was the unincorporated areas of Champaign County under the direct jurisdiction of the County Board. The plan included a description of the environment and natural resources of Champaign County, assessed the predominant natural hazards which threaten the County, and formulated mitigation goals. The plan did not include implementation measures or any level of public input. While the plan met FEMA guidelines at the time, it does not meet the current requirements introduced by DMA 2000.

2005 City of Urbana Hazard Mitigation Plan In 1998, the City of Urbana was invited by FEMA to participate in a program known as “Project Impact”, a national initiative encouraging communities to come together to assess their vulnerabilities to natural hazards and to implement mitigation strategies in advance. As a part of the City’s commitment to this initiative, the City developed and ultimately adopted a Hazard Mitigation Plan meeting FEMA requirements in 2005. The City of Urbana is the first jurisdiction within the County to adopt a FEMA-approved Hazard Mitigation Plan. The City of Urbana was eligible to participate in development of the multi-jurisdictional Champaign County HMP as a means to effectively update its existing Hazard Mitigation Plan.

2007 State of Illinois Hazard Mitigation Plan In 2004, the State of Illinois published the 2004 Illinois Natural Hazard Mitigation Plan (INHMP) in order to comply with requirements of DMA 2000. The plan was updated in 2007. The purpose of the INHMP is to provide a framework for mitigation efforts statewide. The plan aims to reduce future losses and costs to taxpayers by promoting and initiating long-term, interagency mitigation activities.

The plan includes generalized risk assessments for several types of natural hazards for each of the 102 counties in the State. Project staff utilized INHMP information in developing the natural hazards profiles contained in the Champaign County HMP.

Reference

Getting Started: Building Support for Mitigation Planning, Federal Emergency Management Agency, FEMA-386-1, 2002, pp. 1-8.

Chapter 2 Planning Process

Planning Process

The HMP development process included four major stages, with opportunities for public participation throughout, consistent with FEMA guidelines. The four stages of HMP development largely occurred in a sequential timeframe, with overlap to improve upon previous output as necessary. The main stages of HMP development are outlined in Table 2-1.

Table 2-1: Main Stages of HMP Development

Stages	Description
<p>Organize Resources</p> <ul style="list-style-type: none"> ▪ establish website ▪ publicize project ▪ recruit planning team ▪ identify advisory group ▪ invite jurisdictions to participate ▪ allow for public participation throughout HMP development 	<p>The project staff, consisting of the HMP Project Manager, a planning intern, and administrative support staff, publicized the HMP development to all municipal jurisdictions in the County, the University of Illinois at Urbana-Champaign, and Parkland College. The project staff solicited and obtained the agreement of 27 jurisdictions to participate in HMP development. The project staff recruited Planning Team Chair, Planning Team members, Advisory Group members, and oversaw establishment of the HMP website.</p>
<p>Assess Risks</p> <ul style="list-style-type: none"> ▪ identify hazards ▪ profile hazard events ▪ inventory assets ▪ estimate potential losses ▪ review findings ▪ develop press releases 	<p>The project staff identified the natural hazards to profile, and consulted with GIS Consortium staff members regarding their use of HAZUS-MH software throughout the Risk Assessment stage of HMP development. Project staff distributed a poster to display information about the HMP development in local libraries throughout the HMP planning area, distributed a press release, and drafted a Risk Assessment report. The Planning Team and Advisory Group reviewed the findings of the Risk Assessment Stage.</p>
<p>Develop Mitigation Plan</p> <ul style="list-style-type: none"> ▪ conduct public survey ▪ review capabilities of each jurisdiction ▪ formulate goal & determine objectives ▪ identify & prioritize mitigation action(s) ▪ draft implementation strategy 	<p>The project staff developed and publicized the public preference survey. Project staff and Planning Team members researched existing programs, plans, ordinances and documents for each participating jurisdiction that were relevant to HMP development. The project staff provided the Planning Team a review of survey results, background information regarding identification of goals and objectives, types of mitigation actions, and a proposal for prioritizing mitigation actions. Planning Team members discussed mitigation options and provided review comments to project staff. Project staff drafted the HMP document.</p>
<p>Implement Plan & Monitor Progress</p> <ul style="list-style-type: none"> ▪ finalize implementation strategy ▪ establish monitoring program with ongoing opportunities for public input ▪ conduct public meeting ▪ finalize revisions to HMP ▪ participating jurisdictions adopt HMP plan 	<p>The project staff reviewed options for HMP maintenance with Planning Team members. Planning Team members reached consensus regarding a preferred HMP maintenance schedule. Project staff completed the draft HMP document and arranged a public meeting to receive public comment. Upon receiving HMP approval from FEMA, Planning Team members proceeded to seek adoption of the HMP from the jurisdictions directly represented on the Planning Team, and the Project Manager proceeded to seek adoption of the HMP from jurisdictions represented by the Champaign County Regional Planning Commission.</p>

Multi-Jurisdictional Planning Participation

Early in the Organization Stage, HMP project staff contacted representatives of the 24 municipal jurisdictions located wholly or partially within the County to inform each of the opportunity to participate in development of a multi-jurisdictional HMP and to invite their participation. The major higher education institutions in the County (University of Illinois at Urbana-Champaign and Parkland College) were invited to participate in developing the HMP.

All invited jurisdictions agreed to participate in HMP plan development. Table 2-2 lists the jurisdictions and their estimated populations. Nineteen participating jurisdictions not directly represented on the HMP Planning Team provided resolutions authorizing the HMP project staff to represent them and to prepare the plan on their behalf. (Copies of the authorizing resolutions are provided in Appendix 2). Figure 2-1 is a map of all participating jurisdictions.

Table 2-2: Participating Jurisdictions

Key		Jurisdiction that is directly represented on Planning Team.
		Jurisdiction that submitted a resolution authorizing the Champaign County Regional Planning Commission to represent their jurisdiction during HMP development.

	Participating Jurisdiction	2007 Population *
1	University of Illinois at Urbana-Champaign (UIUC)	39,266 students ¹
2	Parkland College	11,000 students ¹
3	Unincorporated area of Champaign County	18,275
4	City of Champaign	75,254 ²
5	City of Urbana	40,550 ²
6	Village of Rantoul	12,402
7	Village of Savoy	6,981 ²
8	Village of Mahomet	6,264
9	Village of St. Joseph	3,982
10	Village of Tolono	2,850
11	Village of Fisher	1,753
12	Village of Philo	1,609
13	Village of Thomasboro	1,222
14	Village of Homer	1,143
15	Village of Sidney	1,129
16	Village of Gifford	1,000
17	Village of Ogden	732
18	Village of Pesotum	508
19	Village of Bondville	446
20	Village of Sadorus	402
21	Village of Ludlow	368
22	Village of Broadlands	311
23	Village of Ivesdale ³	288
24	Village of Allerton ³	277
25	Village of Royal	274
26	Village of Longview	147
27	Village of Foosland	87

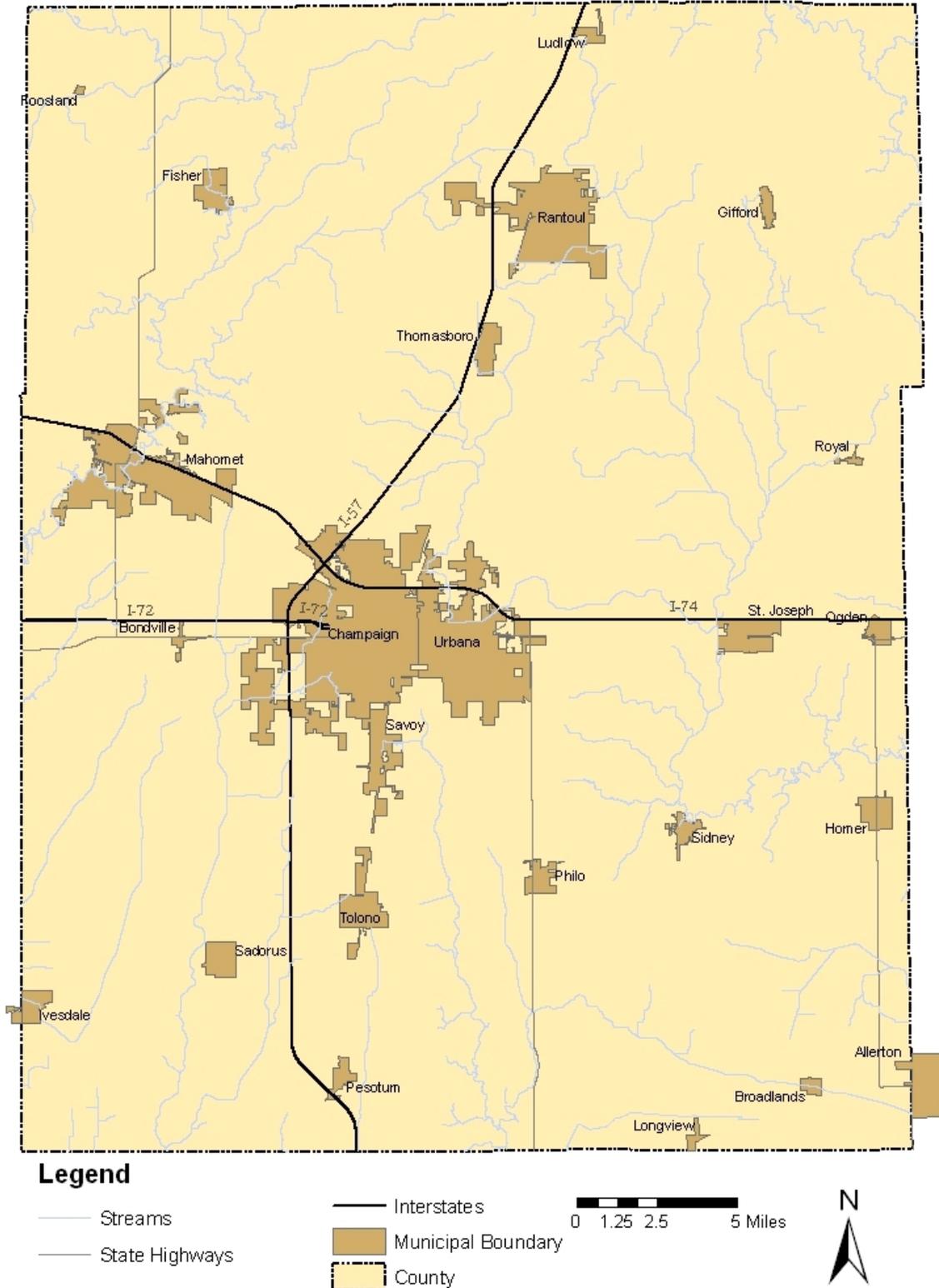
* Source: U.S. Bureau of the Census 2007 Population Estimates

Table 2-1 Notes:

1. Estimates of student enrollment as of Spring, 2007 are provided. The UIUC estimate is from UIUC Management Information PN2006/066, dated February 1, 2007. The Parkland College estimate was provided by the Parkland College Office of Admissions and Enrollment Management. The actual student population is counted as part of the 2007 population estimates indicated for the underlying participating jurisdictions.

2. The 2007 Special Census population final figure is shown for the City of Champaign. The 2008 Special Census final figure is shown for the City of Urbana and the Village of Savoy.
3. Although the Villages of Ivesdale and Allerton are located partially within Champaign County, the entire geographic area of each Village is included as a participating jurisdiction.

Figure 2-1: Map of Participating Jurisdictions



Planning Team

With a total of 27 jurisdictions committed to participating in HMP development, HMP project staff selected a ‘combination’ approach to represent participating jurisdictions on the HMP Planning Team. This approach allowed for the direct representation of the seven largest populated jurisdictions and two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team. The combination approach allowed for the direct representation on the Planning Team of approximately 90 percent of the population of all participating jurisdictions.

Early in the Organization Stage, HMP project staff recruited Champaign County EMA Director Bill Keller to serve as Planning Team Chairperson.

Table 2-3: Combination Approach Used to Represent All Participating Jurisdictions

Jurisdictions with Direct Representatives on Planning Team

Participating Jurisdiction	Direct Representative
University of Illinois at Urbana-Champaign	Todd Short , Director, Office of Campus Emergency Planning
Parkland College	Bonita Burgess , Public Safety Lieutenant; Von Young , Public Safety Director
Champaign County	Bill Keller (Chair of Planning Team), Director; Champaign County Emergency Management Agency John Dwyer , Emergency Response Planner, Champaign Public Health District
City of Champaign	Steve Clarkson , Emergency Management Coordinator, John Barker , Acting Deputy Chief, City of Champaign Fire Department Rob Kowalski , Assistant Planning Director, City of Champaign
City of Urbana	Tony Foster , Division Chief, Prevention and Education Robert Myers , Planning Manager
Village of Rantoul	Dan Culkin , Chief Inspector
Village of Mahomet	Bob Mahrt , Village Planner,
Village of Savoy	Jeremy Leevey , Public Education & Prevention Coordinator
Village of St. Joseph	James Haake , Village of St. Joseph Trustee; Terry Hitt , Village of St. Joseph Trustee

Jurisdictions providing Authorization to be represented on Planning Team

Participating Jurisdiction	
Village of Tolono Village of Fisher Village of Philo Village of Thomasboro Village of Homer Village of Sidney Village of Gifford Village of Ogden Village of Pesotum Village of Bondville Village of Sadorus Village of Ludlow Village of Broadlands Village of Ivesdale Village of Allerton Village of Royal Village of Longview Village of Foosland	<p>Authorization Provided by Village Board of Trustees to Champaign County Regional Planning Commission HMP Project Staff to Represent Jurisdiction on Planning Team</p>

Planning Team Meetings The Planning Team met a total of seven times between April, 2008 and May, 2009 to guide and review each stage of HMP development.

Meeting One: The initial meeting of Planning Team members included an introduction to the HMP development process, and the setting of guidelines for participation as an HMP Planning Team member. Planning Team members agreed that jurisdiction representatives should strive to attend each Planning Team meeting, and if that was not possible, to send a substitute representative to each Planning Team meeting. An overview of required HMP elements was provided, including means of encouraging public participation throughout HMP development, within project budget. The idea to form an HMP Advisory Group received support of the Planning Team, and the HMP timeline was reviewed.

Meeting Two: Existing programs, plans, ordinances and documents of participating jurisdictions were reviewed as they related to HMP development. The use of HAZUS-MH software was described for the Risk Assessment stage. The methods used to identify buildings, infrastructure, and critical facilities were reviewed. Hazard identification and hazard profiling were reviewed.

Meeting Three: Review of Risk Assessment findings occurred. An overview of the Mitigation Plan Development Stage was provided. The Planning Team formulated HMP goal statements.

Meeting Four: Plans for a public preference survey regarding mitigation actions were discussed. Planning Team members began the process of identifying existing and proposed mitigation actions for their jurisdiction.

Meeting Five: Planning Team members continued review of existing and proposed mitigation actions. Results of the HMP public preference survey were reviewed. Planning Team members decided on a method for prioritizing mitigation actions.

Meeting Six: Planning Team members prioritized the ongoing and proposed mitigation actions selected for each of their jurisdictions. Members discussed the HMP maintenance process and reached consensus regarding a method to monitor, evaluate, and update the HMP.

Meeting Seven: Planning Team members offered review comments of the HMP Review Draft and planned the public HMP review meeting.

Authorized Representation of Smaller Jurisdictions on Planning Team

Nineteen of the participating jurisdictions authorized project staff to represent their interests on the Planning Team during HMP development. Project staff achieved this as follows:

February-April, 2008

Project staff followed up via phone or email with the Village President of each of the smaller municipal jurisdictions, to answer questions or provide additional information about the proposed HMP development as described in an initial letter from the County Board Chair sent in January, 2008, and encouraged the Village's participation in the development of the HMP.

Upon request, project staff made presentations to the Village Board of Trustees about the proposed HMP project.

May, 2008

Project staff contacted representatives of each of the smaller municipal jurisdictions in order to collect data and ask questions about the enforced building codes, regulations, ordinances, and adopted plans of each Village.

October, 2008

Project staff contacted the Village President to review the types of ongoing mitigation actions of the Village, and to obtain feedback regarding what types of mitigation actions would make the most sense and would be most feasible for the Village to consider.

November, 2008

Project staff contacted the Village President to request assistance in collecting information about preferred mitigation actions for the Village. The Village President was asked to:

- inform Village Trustees and Village residents about the HMP Mitigation Action Preference Survey available for the public to take online. Paper copies of the Mitigation Action Preference Survey were provided to each participating jurisdiction; and
- arrange for the Village to post a link to the HMP Mitigation Action Preference Survey on the Village website, if the Village had a Village website. Project staff provided an instruction sheet for posting a link to the HMP Mitigation Action Preference Survey on the Village's website.

Project staff provided information posters to display at libraries throughout the HMP planning area. Posters included information about: types of natural hazards reviewed; types of risks assessed; ongoing mitigation planning efforts; information about an opportunity to provide feedback in a preference survey about hazard mitigation measures; who to contact for additional information; and the date, time and location of the public meeting scheduled to occur toward the end of the HMP development process.

December, 2008

Project staff followed up via email or phone with the Village Presidents regarding the letter sent in November, 2008, and provided additional information or copies of the Survey, upon request.

June, 2008

Project staff emailed the Village Presidents to provide a reminder regarding the upcoming public meeting to receive public comment on the HMP.

Project staff sent a letter to Village Presidents to share with the Village Board of Trustees. The letter contained a project update, and invited feedback regarding the Final Draft of the HMP, and requested that the Board of Trustees begin the process of review of the Final Draft of the HMP for adoption by the Village.

July-August, 2008

Project staff plans to be available to make presentations to Village Board of Trustees as they review the HMP for adoption.

Advisory Group

A broad-based HMP Advisory Group was recruited in early 2008 during the Organization Stage to support the Planning Team in their review of the draft HMP document and to provide their additional input at key stages during the project. Advisory Group members included representatives of each school district in Champaign County, key area-wide public and private service providers, and selected government agency representatives. The HMP Advisory Group members and their affiliation are listed below:

Advisory Group Members

- **Edward Bland**, Executive Director, Housing Authority of Champaign County
- **Jeff Blue**, County Engineer, Champaign County Highway Department
- **Jamie Davis**, Emergency Services Coordinator, Central Illinois Chapter, American Red Cross
- **Sandra Duckworth**, Director of Information Technology, Champaign School District
- **Kimberly Garrison-Clanton**, Manager of Marketing and Public Relations, Provena Medical
- **Anita Guffey**, Director of Emergency Preparedness, Carle Foundation Hospital
- **Andy Larson**, Superintendent, Heritage Community Unit School District
- **Beverly Herzog**, Senior Hydro geologist and Assistant to the Director for Environmental Initiatives, Illinois State Geological Survey, University of Illinois
- **Michael Little**, Executive Director, Urbana-Champaign Sanitary District
- **Drusilla Lobmaster**, Superintendent, Ludlow Community Consolidated School District
- **Alicia Maxey**, School Resource Officer, St. Joseph-Ogden Community High School District
- **Keith Oates**, Superintendent, Mahomet-Seymour Community Unit School District
- **Don Owen**, Assistant Superintendent, Urbana School District
- **Todd Pence**, Superintendent, St. Joseph Community Consolidated School District
- **Sally Prunty**, Planning Director, Champaign County Forest Preserve District
- **Michelle Ramage**, Superintendent, Thomasboro Community Consolidated School District
- **David Requa**, Superintendent, Rantoul Township High School District
- **Art Shaw**, Superintendent, Gifford Community Consolidated School District
- **Michael Shonk**, Superintendent, Tolono Community Unit School District
- **Dan Smith**, Illinois Emergency Management Agency
- **Stuart Smith**, Parts Administrator, Champaign-Urbana Mass Transit District
- **Bruce Stickers**, Resource Conservationist, Champaign County Soil and Water Conservation District
- **Barbara Thompson**, Superintendent, Fisher Community Unit School District
- **Victor White**, Superintendent, Prairieview Community Consolidated School District

During the Spring of 2009, project staff contacted selected County administrators and planners of each County adjacent to Champaign County to notify them regarding the development of the Champaign County HMP and to solicit their input regarding any aspect of the Champaign County multijurisdictional HMP project. These contacts were made to representatives of Ford, McLean, Piatt, Douglas, and Vermilion Counties.

Public Participation

Ongoing opportunities for citizen input were an essential component of the HMP development process. Efforts to inform the public and to allow for their effective participation in HMP decision-making are described below.

- **Initial Outreach.** During the Organization Stage, key representatives of all municipalities in or partially in the County were invited to participate in developing a multi-jurisdictional HMP.

Each municipal jurisdiction placed the request to participate in developing an HMP on its Council or Trustee public meeting agenda. By request, HMP project staff reviewed benefits of mitigation planning with Village Trustees at public meetings in the Villages of Tolono, Pesotum, and Sadorus.

- **Interactive HMP Website.** During the Organization Stage, the HMP website (<http://www.ccrpc.org/HMP>) was created as a means to both share information with the public about development of the Champaign County HMP and to provide an interactive means to allow public feedback regarding the HMP during its development. The website included agendas and minutes of each HMP Planning Team meeting, plus related documents and links. Participating jurisdictions were encouraged to include a link to the HMP website from their own websites.
- **Public Notice of Planning Team Meetings.** A public notice of each HMP Planning Team Meeting was published beforehand in The News-Gazette, the newspaper in the County with the largest overall circulation.
- **Press Releases.** Press releases were issued during the risk assessment, mitigation planning, and implementation stages of HMP development. The press releases included information about opportunities for public participation in development of the HMP.
- **Information Displays.** Posters informing the public about ways to participate in HMP development were displayed at public libraries within the HMP area. Posters included information about: types of natural hazards reviewed; types of risks assessed; ongoing mitigation planning efforts; information about an opportunity to provide feedback in a preference survey about hazard mitigation measures; who to contact for additional information; and the date, time and location of the public hearing scheduled to occur toward the end of the HMP development process.
- **Public Preference Survey.** In December, 2008 and through mid-January, 2009, a preference survey regarding selected mitigation measures under consideration for each jurisdiction was made available to members of all participating jurisdictions online. Paper copies of the preference survey were provided to the primary contact for each participating jurisdiction and were made available upon request.
- **Public Hearing.** A public hearing was held before the Champaign County Environment and Land Use Committee on June 8, 2009. Comments and questions from the public were considered regarding aspects of the HMP draft itself, or regarding the process of HMP development.

References

Getting Started: Building Support for Mitigation Planning, Federal Emergency Management Agency, FEMA-386-1, 2002, p. xi.

Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning How-To Guide Number Eight, Federal Emergency Management Agency, FEMA-386-8, 2006, p. 12.

Chapter 3 Hazard Profiles

Identifying Natural Hazards

The State of Illinois prepared a statewide Natural Hazard Mitigation Plan (INHMP) in 2004, which was updated in 2007. The INHMP contains an analysis of the risk and impact of various natural hazards to each Illinois County, and provides hazard ratings across counties for each profiled natural hazard. The INHMP was based on data compiled between 1950 and 2002. Five rating levels were assigned, ranging from 'Low' to 'Severe'. The INHMP rating system is based on a combination of four factors: Historical/Probability, Vulnerability, Severity of Impact, and Population.

The INHMP indicates that Champaign County is at risk from these natural hazards: severe storms, tornados; severe winter storms; floods; extreme heat; drought, and earthquakes. Table 3-1 contains the INHMP ratings assigned to these natural hazards in Champaign County.

Table 3-1: INHMP Ratings Assigned to Natural Hazards in Champaign County

Natural Hazard	INHMP Rating for Natural Hazards Occurring in Champaign County	Description of INHMP Rating
Severe Winter Storms	Severe	Score range: 49-60 ... Highest amount of points possible based on INHMP weighted rating system.
Severe Storms	Severe	Score range: 49-60 ... Highest amount of points based on INHMP weighted rating system.
Tornados	High	Score range: 37-48 ... Second highest amount of points possible based on INHMP weighted rating system.
Floods	High	Score range: 37-48 ... Second highest amount of points possible based on INHMP weighted rating system.
Extreme Heat	Elevated	Score range: 25-36 ... median amount of points possible based on INHMP weighted rating system.
Earthquakes	Elevated	Score range: 25-36 ... median amount of points possible based on INHMP weighted rating system.
Drought	Guarded	Score range: 13-24 ... Second lowest amount of points possible based on INHMP weighted rating system.

Source: Illinois Natural Hazard Mitigation Plan, October, 2004

Based on the above INHMP natural hazard ratings, the Planning Team agreed to profile the following natural hazards for the HMP planning area:

- Severe Storms (including: tornados, damaging lightening, and hail)
- Severe Winter Storms
- Floods
- Extreme Heat
- Drought
- Earthquakes

Federal Disaster Declarations in Champaign County

Champaign County has been included in four Federal Emergency Disaster Declarations since 1967, the first year that there was a federal disaster declaration in Illinois under the Office of Emergency Preparedness, a predecessor of FEMA. These Federal Disaster Declarations are described below and illustrate the significant damages that can occur in the HMP planning area as a result of natural hazards to be profiled in the Champaign County HMP.

1990 Ice Storm (Declaration #: FEMA 860-DR)

The first recorded Federal Disaster Declaration that included Champaign County occurred in 1990. On February 14th, Champaign County, along with nine other counties in Illinois, was hit by an ice storm. A total of 1.8 inches of rain fell over a 10- to 12-hour period, resulting in between 0.5 and 0.75 inches of ice accumulating on exposed surfaces. According to a report prepared by Richard J. Hauer, et al., more than 18,000 homes in Champaign-Urbana lost power, some for as long as eight days. Ice-laden tree branches that fell on power lines were the main causes of the power outages. The City of Urbana Hazard Mitigation Plan notes that over half of the trees in Champaign-Urbana were damaged in the storm. Falling tree branches were also responsible for causing damage to houses and automobiles. The City of Urbana incurred \$768,000 in costs for emergency response and clean-up. The NOAA estimates that the storm caused in excess of \$12 million in damages in Champaign County.

1994 Floods (Declaration #: FEMA 1025-DR)

In 1994, the large scale flooding that occurred in 16 Illinois counties, including Champaign County, led to the second recorded Federal Disaster Declaration for Champaign County. Heavy rains fell over a two-day period in April of that year and resulted in excess of \$50 million in damages to homes, businesses, and property in the County.

1996 Tornadoes (Declaration #: FEMA 1110-DR)

In April of 1996, a series of tornadoes swept through Central Illinois, triggering a Federal Disaster Declaration that included Champaign County and four other counties. The tornadoes caused significant damage in the County, particularly in the Village of Savoy, City of Urbana and the Village of Ogden. The damage done in Savoy and Urbana was estimated at \$9 million. The Village of Ogden sustained even heavier damage, with more than 200 homes receiving major damage, 80 homes completely destroyed and 13 people suffering minor injuries.*

* From the Village of Ogden website at
[http://ww2010.atmos.uiuc.edu/\(Gh\)/arch/cases/960419/dmg/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/arch/cases/960419/dmg/home.rxml)

1999 Winter Snow Storm (Declaration #:FEMA 3134-EM)

A Snow Emergency Declaration was issued on January 8, 1999 for 34 counties in Central and Northern Illinois, including Champaign County. A National Weather Service report described the storm as follows:

“A major winter storm paralyzed much of the region, during the first few days of 1999. Snow began falling across portions of Central Illinois before noon on New Year’s Day, and continued at moderate to heavy rates for most of the following 24 hour period. Areas from Charleston southward also saw the snow mixed with rain or freezing rain at times. Once the snow ended, high winds developed, causing severe blowing and drifting snow, and dangerous wind chills. The heaviest snow band

extended from near Quincy, to Virginia, then through the Peoria and Bloomington areas to Champaign, where 14 or more inches of snow were common. The weight of the heavy snow caused many roofs and porches to collapse, causing one death and one injury.”

2002 Severe Storms, Tornadoes and Floods (Declaration #: FEMA 1416-DR)

The most recent Federal Disaster Declaration that included Champaign County resulted after a series of severe storms occurred between April 21-May 3, 2002, producing tornadoes and flooding that caused widespread damage to Champaign County and 67 other Central Illinois counties.

**Hazard Profile:
 Severe Storms**

In Illinois, severe storms occur as warm, moist air from the Gulf of Mexico comes in contact with cool air moving east from the Rockies.

The natural hazard category of ‘Severe Storms’ includes: thunderstorms, tornadoes, hail, and damaging lightning.

The *Climate Atlas of Illinois* defines a ‘thunderstorm’ as “a local storm produced by cumulonimbus clouds and always accompanied by lightning and thunder, and often by strong gusts, heavy rain, and hail.” Thunderstorms can form as single cells, in clusters, or in lines and that the typical thunderstorm is 15 miles in diameter. Thunderstorms in Illinois are most likely to occur in the spring and summer months and usually in the late afternoon or evening. The National Weather Service (NWS) estimates that 10 percent of thunderstorms that occur are ‘severe storms’. The NWS distinguishes a ‘Severe Storm’ from a regular thunderstorm if it produces hail at least 0.75 inches in diameter, or consecutive wind gusts 58 miles per hour or greater. Severe storms are hazardous because of the lightning, hail and tornadoes they are capable of producing. The INHMP ranks the risk of Severe Storms in Champaign County as “severe,” which is the highest risk ranking.

Consequences of Severe Storms The different elements of severe storms each have the potential to do serious damage. The consequences and threats associated with rain include: flooding; reduced visibility; increased chance of automobile accidents; stormwater system backup; and crop damage. High winds and tornadoes can cause: building damage; downed power lines; auto accidents; tree damage; crop damage; injury; or death. Lightning can cause: fires; power outages; damage to electronics and appliances; injury; or death. Hail can cause building, vehicle and crop damage, and injury, in rare cases.

Locations Affected by Severe Storms The entire HMP planning area is at risk from severe storms, including lightning, tornadoes, and hail.

History and Extent of Previous Occurrences The National Climatic Data Center (NCDC) recorded 160 thunderstorm and high wind events in Champaign County between 1955, the earliest year for which there is data in the NCDC storm event database for this type of event, and 2007. Of the 160 storms, 16 caused an injury, a death, or property damage. Table 3-2 contains a summary description of these 16 storms.

Probability of Future Severe Storm Events Severe storms are very likely to occur over the entire HMP planning area. According to the NCDC, during the 53-year period between 1955 and 2007, a total of 160 thunderstorms with severe winds occurred in 43 different years. There is an 81% probability that a thunderstorm with severe winds will occur in the HMP planning area in any given year. In 33 years during the same time frame, more than one of these events occurred in the same year, indicating a 62% chance that more than one of these storms will occur in the HMP planning area in any year.

Table 3-2: Thunderstorm and High Wind Events Causing Damage 1955-2007

Location or County ¹	Date	Time	Recorded Windspeed ²	Deaths	Injuries	Property Damage
CHAMPAIGN	06/29/1987	3:04 PM	N/A	0	5	0
CHAMPAIGN	03/25/1996	4:00 AM	N/A	1	0	0
Sadorus	08/23/1996	2:55 PM	N/A	0	0	5 K
CHAMPAIGN	04/30/1997	2:00 PM	61 kts.	0	1	38 K
Mahomet	08/24/1997	1:38 PM	N/A	0	0	700 K
Philo	03/28/1998	5:15 AM	N/A	0	0	90 K
Homer	06/12/1998	3:38 PM	N/A	0	1	0
Countywide	06/29/1998	4:42 PM	72 kts.	0	2	500K
Champaign	07/23/2001	1:38 PM	52 kts.	0	0	15 K
CHAMPAIGN	03/09/2002	2:00 AM	76 kts.	0	2	0
CHAMPAIGN	03/05/2004	7:05 AM	50 kts.	1	6	0
Ludlow	07/13/2004	2:07 PM	78 kts.	0	0	2.2 M
Urbana	07/18/2007	2:51 PM	N/A	0	0	2K
Champaign	10/18/2007	5:19 PM	N/A	0	0	2K
Ogden	10/18/2007	5:55 PM	N/A	0	0	31K

Source: National Climatic Data Center

Table 3-2 Notes

1. "CHAMPAIGN" in all capital letters refers to an unspecified location within Champaign County.
2. N/A means that recorded windspeed data is not available.

Lightning

All thunderstorms produce lightning strikes. Lightning, as described by FEMA, is caused when electrical energy builds up and is discharged between positively and negatively charged areas. Only 25 percent of lightning strikes are cloud-to-ground; however, lightning still poses a significant threat during severe storms. According to the NWS, lightning can strike up to ten miles away from where it is raining.

The INHMP states that lightning kills more people each year than tornados. Each year in the United States, approximately 1,000 people are injured and 80 are killed by lightning. Further, lightning fatalities generally occur at outdoor recreational events and near trees. The economic

impact of lightning in the United States is estimated at \$5 billion every year. In Illinois, a total of 96 people have died as the result of lightning over the past 40 years, ranking Illinois high amongst the states for the number lightning fatalities.

History and Extent of Previous Occurrences of Damaging Lightning Since the beginning of 1993, the earliest year that the NCDL storm events database tracked damage caused by lightning, through the end of 2007, there was one reported occurrence of lightning causing damage in Champaign County. That incident was a lightning strike that caused an injury on July 14, 1997 in the Village of Mahomet. The NCDL storm event database states:

“Lightning struck a television antenna on a home in Mahomet. It travelled through the roof and knocked a man out of his wheelchair. He only suffered minor injuries and was treated and released from a local hospital. The lightning strike caused approximately \$3,500 in damage to the roof.”

Probability of Future Lightning Strike Damage The one reported case of lightning damage reported since 1993 suggests that there is approximately a 7% chance that there will be a lightning strike which causes damage in any given year in the HMP planning area. Local reviewers of the HMP indicated that damaging lightning strikes often burn buildings or destroy electrical devices in buildings throughout the HMP planning area, and that damaging lightning is typically under-reported.

Hail

Severe storms are capable of producing hail. Hail, round balls of ice and snow, can potentially damage both crops and property. Additionally hail can cause icy surfaces that cause people to slip and fall, or vehicular accidents. Table 3-3 describes the different categories of hail based on size.

Table 3-3: Hail Size Classification

Size (Inches)	Description
1/2	Marble Size
3/4	Penny Size
7/8	Nickel Size
1	Quarter Size
1 1/4	Half Dollar Size
1 1/2	Ping Pong Ball Size
1 3/4	Golf Ball Size
2	Egg Size
2 1/2	Tennis Ball Size
2 3/4	Baseball Size
3	Teacup Size
4	Grapefruit Size
4 1/2	Softball Size

According to the INHMP, as of October 2004, hail storms had occurred 3,951 times in Illinois since 1950, or an average of 74 times every year. No one in Illinois has died as the result of hail since 1950; however, 23 people have been injured, as well as numerous domestic or farm

animals. It is estimated that between 1950 and 2003 hail caused \$73 million dollars in property damage and \$5 million in crop damage statewide.

History and Extent of Previous Hail Storms According to the NCDC, there were 71 different storms which produced hail in Champaign County between 1955, the first year that the NCDC storm event database tracks hail events, and 2007. The storm descriptions reveal that, generally, the larger the size of the hail, the more damage it causes. One of the most notable hail storms in Champaign and Vermilion counties occurred on May 18, 2000. The NCDC describes the storm:

“A series of thunderstorms (six) formed and moved over a two county area over a 2-1/2 hour period. Over \$4 million dollars worth of damage was reported. The most intense damage was reported in the Jamaica and Georgetown (Vermilion County) areas. Georgetown was hit twice within an hour’s time by baseball sized hail. A greenhouse sustained major damage. Thousands of cars sustained major hail damage, including broken windshields. Also, hundreds of homes and businesses had windows broken out and siding damaged. In Jamaica, the high school sustained around \$300,000 in damage to its facilities. In Pesotum (Champaign County), eleven Illinois State Patrol squad cars sustained minor to major hail damage. A couple of the cars had windshields broken, as well as the light bars on top. Damage to the squad cars was estimated around \$24,000. No injuries were reported.”

Table 3-4: Number of Hail Events by Jurisdiction 1955-2007

Jurisdiction	Number of Hail Events
Unspecified - Champaign County	36
Broadlands	1
Champaign	11
Rantoul	4
Mahomet	14
Ivesdale	7
Philo	3
Tolono	2
St. Joseph	2
Sadorus	1
Urbana	3
Sidney	1
Ogden	3
Pesotum	2
Fisher	2

Probability of Future Storms Which Produce Hail In the 53-year period between the beginning of 1955 and the end of 2007 in Champaign County, there were 71 different storms which produced hail occurring in 33 different years. This indicates a 62% probability that there will be a storm which produces hail in the HMP planning area in any given year. Over this same time period, there were 20 years in which more than one storm produced hail. This indicates a 38% chance that in any given year there will be more than one storm which produces hail in the HMP planning area.

Tornados

Severe storms not only have the potential to cause damage from lightning and hail, but they can produce tornados. Tornados are most common in the Midwest and southeastern parts of the country. Tornados most frequently occur between March and August, but can occur any time of the year. The American Society of Civil Engineers (ASCE) produces design wind speed standards for construction. The HMP planning area is in Zone IV, meaning that a community shelter must be built to withstand a 3 second 250 mph wind gust. The INHMP categorizes the risk of tornados to Champaign County as “High,” which is the second highest ranking. Champaign County experienced 44 tornados between 1950, the earliest year that the NCDC storm event database collected tornado data, and 2002. According to the INHMP, this ranks Champaign County as the 14th highest county in Illinois for the number of tornados per square mile over this time period.

The intensity of tornados, including their wind speed and the type of damage they cause, are categorized by the Enhanced Fujita Scale, which was created and implemented by the NWS in February of 2007.

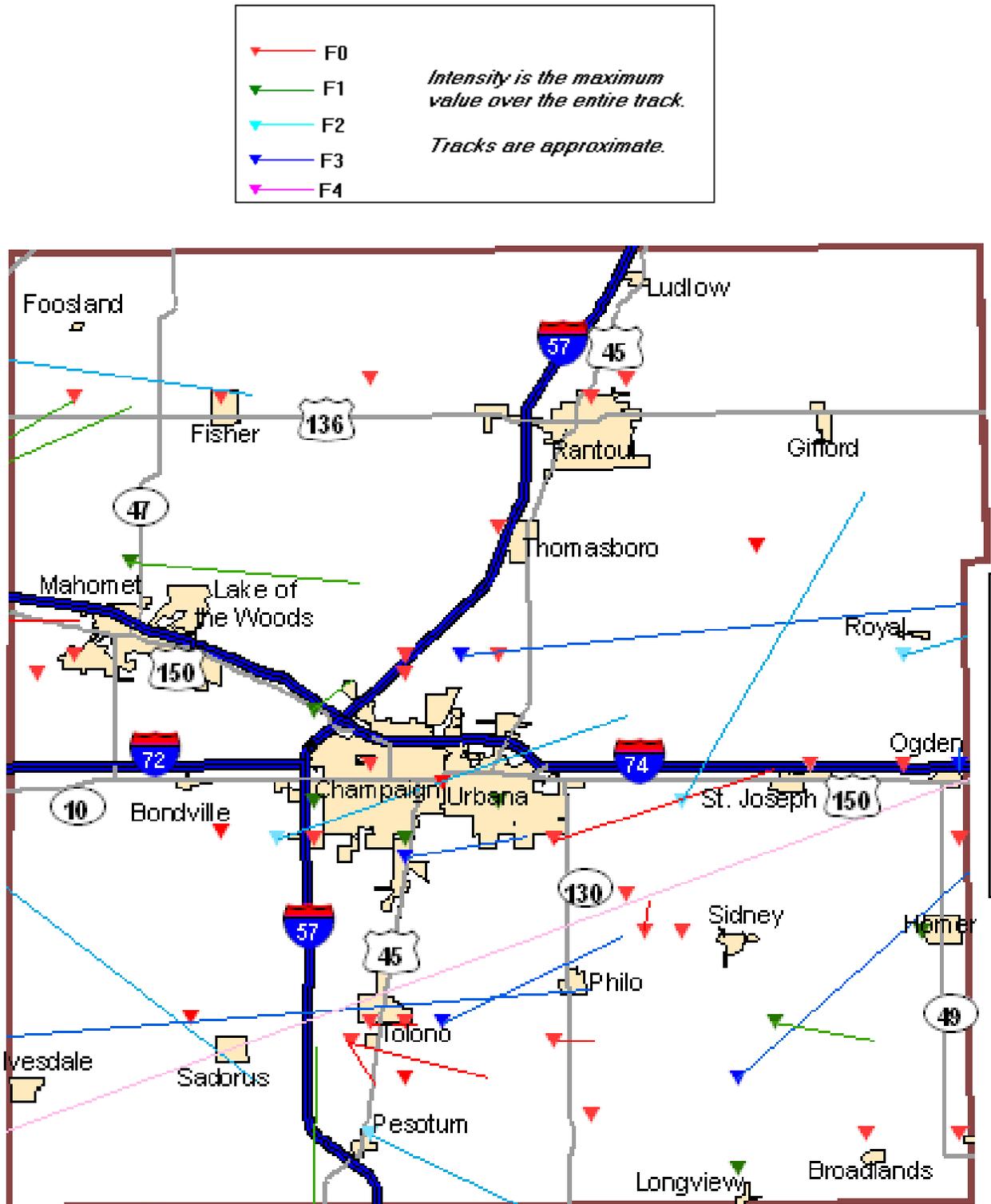
Table 3-5: Enhanced Fujita Scale

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

Source: National Weather Service

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Figure 3-1: Champaign County Tornadoes 1950 to 2007



Source: National Weather Service, <http://www.crh.noaa.gov/ilx/?n=champaign-tor>

History and Extent of Previous Tornadoes

The most recent large tornado to hit Champaign County was on April 19, 1996. The tornado first touched down near Savoy, and then in Ogden. The NCDC describes the tornado in the following two accounts:

“A tornado briefly touched down one mile north of Savoy (near Rt. 45 and Curtis Road) and destroyed three homes under construction. Then the tornado lifted, travelled to the northeast, and touched down again one mile south of Urbana. The tornado destroyed 30 homes, caused moderate damage to 29 homes and one business, and minor damage to 54 homes and four businesses. Twelve people were injured and damage was estimated between \$7 and \$11 million.”

“A tornado touched down half a mile to the southwest of Ogden and travelled to the northeast right through the middle of the town. The tornado destroyed 68 homes, 12 businesses, three churches, the library, and a grade school. Once east of town, the tornado crossed I-74, where it killed a woman who was riding in a semi with her husband. The semi and trailer were picked up and rolled into a field. The woman, who had been in the sleeper portion, was thrown about 30 yards from the truck. She was killed instantly. After rolling the semi, the tornado damaged two more homes before lifting and dissipating one mile north northeast of Ogden. Back in Ogden, the damage was variable. One house would have significant damage, when a nearby structure would only have minor damage. In addition to the destroyed homes and businesses, 128 homes and 8 businesses sustained major damage and 51 homes and 12 businesses had minor damage. With its larger width, it appears that this tornado had multiple circulations within the parent tornado. Overall, one woman was killed and 13 people were injured.”

Table 3-6 lists information regarding all tornadoes causing either injuries or property damage in the HMP planning area between 1950 and 2007.

Probability of Future Storms Which Produce Tornadoes In the 58-year period from 1950, the first year that the NCDC Storm Events Database tracks tornadoes, through 2007 there were 45 different storms which produced tornadoes in Champaign County occurring in 27 different years. This indicates that there is a 47% probability that there will be a storm which produces a tornado in the HMP planning area in any given year. In this same time period, there were 16 different years in which there was more than one storm that produced a tornado in the County. This suggests that there is a 28% chance that there will be more than one storm that produces a tornado in the HMP planning area in any year.

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Table 3-6: Tornadoes Causing Injuries or Property Damage 1950 – 2007

Location*	Date	Time	Magnitude	Deaths	Injuries	Property Damage
Leverett	04/09/1953	5:15 PM	F3	0	5	25 M
Ivesdale	06/05/1960	12:49 AM	F2	0	1	250 K
Tolono	06/23/1960	4:03 AM	F2	0	0	25 K
Urbana	03/04/1961	6:15 PM	F0	0	0	25 K
Broadlands	03/06/1961	4:37 AM	F2	0	0	250 K
Royal	07/02/1962	3:30 PM	F2	0	0	25 K
Sadorus	04/22/1963	6:32 PM	F3	0	5	250 K
Champaign	01/24/1967	8:40 PM	F2	0	5	25 K
Champaign	04/21/1967	8:50 PM	F1	0	0	3 K
Urbana	12/10/1971	5:00 AM	F1	0	0	250 K
Tolono	04/03/1974	2:48 PM	F3	1		250 K
Homer	04/03/1974	2:55 PM	F3	0	0	250 K
St. Joseph	04/12/1974	8:05 PM	F2	0	0	250 K
CHAMPAIGN	03/20/1976	1:35 PM	F4	0	11	2.5 M
CHAMPAIGN	06/08/1981	8:37 PM	F1	0	0	25 K
Mahomet	06/08/1981	8:40 PM	F1	0	0	25 K
Homer	08/28/1984	6:09 PM	F1	0	0	250 K
Fisher	11/19/1985	4:04 PM	F1	0	0	250 K
St. Joseph	06/02/1987	1:12 PM	F2	0	0	25 K
Urbana	05/09/1990	7:40 PM	F1	0	0	25 K
Pesotum	06/20/1990	12:55 AM	F2	0	0	2.5 M
Savoy	04/19/1996	7:34 PM	F3	0	12	9 M
Ogden	04/19/1996	7:55 PM	F3	1	13	N/A
Mahomet	06/20/2000	8:14 PM	F0	0	0	20 K
Champaign	10/24/2001	12:55 PM	F1	0	2	500 K
Pesotum	04/20/200	1:06 PM	F0	0	0	15K
Sidney	06/10/2004	1:38 PM	F1	0	0	5K
Totals:				2	55	41.993 M

Source: National Climatic Data Center

Table 3-6 Note*: "CHAMPAIGN" in all capital letters refers to an unspecified location within Champaign County.

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**Hazard Profile:
 Severe Winter Storms**

Severe winter storms fall into three categories: blizzards; heavy snow storms; and ice storms. These are defined in the INHMP, as follows:

Blizzard

A blizzard is the most dangerous of all winter storms. A blizzard combines low temperatures, heavy snowfall and winds of at least 35 miles per hour, reducing visibility to only a few yards.

Ice Storm

An ice storm occurs when moisture falls and freezes immediately upon impact.

Heavy Snow Storm

A snow storm is one that produces six inches or more of snow in 48 hours or less.

The National Weather Service (NWS) categorizes severe winter storms for the purposes of providing early warning, which is important for minimizing their potential impacts. The NWS issues these types of warnings regarding severe winter storms:

- A *Winter Weather Advisory* is issued when a significant winter storm or hazardous winter weather is occurring, imminent, and is an inconvenience.
- A *Winter Storm Warning* is issued when a significant winter storm or hazardous winter weather is occurring, imminent, or likely and is a threat to life and property.
- A *Heavy Snow Warning* is issued if significant snowfall is expected; criteria vary depending on location.
- A *Blizzard Warning* is issued when winds are 35 mph or greater, with blowing snow reducing visibility to a quarter-mile or less for at least three hours, and when dangerous wind chill temperatures are expected in the warning area.

Consequences of Severe Winter Storms

Deaths from dangerously low temperatures, power outages, and injuries and fatalities from hazardous driving conditions are the main threats posed by severe winter storms.

Locations Affected by Winter Storms

All of the jurisdictions and locales within the county are at risk from severe winter storms. These storms usually cover a geographic area that is much larger than a single county. Due to their vast open spaces, peripheral agricultural areas are at greater risk for the “white outs” and drifting associated with heavy snow and blizzards. Ice storms often do more damage to higher density areas because of the presence of large shade trees and overhead electrical lines.

History and Extent of Previous Severe Winter Storms

Severe winter storms can cause casualties, and have caused numerous traffic fatalities and injuries in Champaign County. According to the NCDC there have been seven deaths and 37 injuries in Champaign County and surrounding counties due to snow and ice storms since 1993. Winter storms are also capable of causing serious property damage, including costly damage to

electrical utilities. Destruction of electrical utility infrastructure not only affects the utility companies, but can cause loss of revenue for businesses if they experience power service interruption.

Probability of Future Severe Winter Storms

Severe winter storms are common in the HMP planning area. In the 15-year period between the beginning of 1993 and the end of 2007, there were 24 winter storm events in 13 different years. This indicates that there is an 87% chance that there will be a winter storm event in the HMP planning area in a given year. In eight of those years, there was more than one winter storm event. This suggests that there is a 53% chance that there will be more than one winter storm event in a year in the HMP planning area.

**Hazard Profile:
 Floods**

The INHMP states that flooding is the second most common hazard in the United States, following fire. A simple definition of flooding is “an overflow of water onto land that is normally dry.” IEMA identifies the following types of floods among others: riverine floods, flash floods, overland floods, and coastal floods.

Riverine Floods Riverine floods occur when water from rainfall or snow melt flows at a quantity and speed that a river, stream, or creek cannot absorb. The result is that the areas immediately surrounding these bodies of water can become inundated with water. These types of floods usually develop slowly over the course of several days or weeks, as precipitation accumulates.

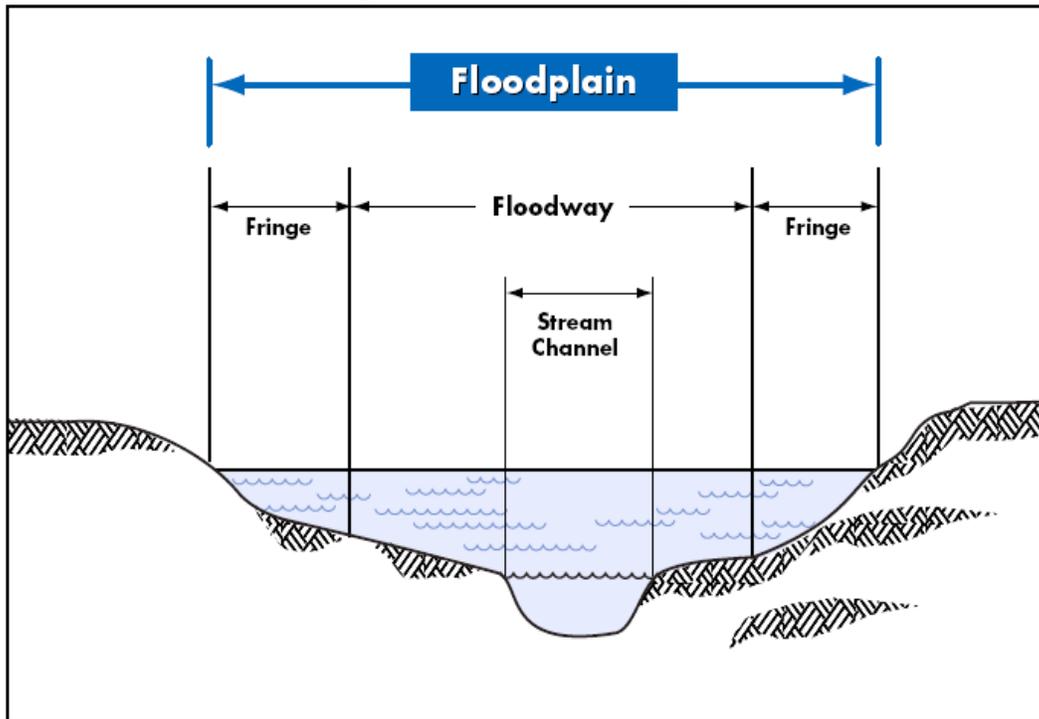
The estimated probability of a riverine flood event occurring in any given year is typically described using the terms: ‘10-year’, ‘50-year’, ‘100-year’ or ‘500-year’ flood. These terms are referenced in the process of determining flood insurance rates in flood-prone areas as follows:

- a 10-year flood event has a ten percent probability of occurring in any given year;
- a 50-year flood event has a two percent probability of occurring in any given year;
- a 100-year flood event has a one percent probability of occurring in any given year; and
- a 500-year flood event has a 0.2 percent probability of occurring in any given year.

Though unlikely, it is possible to have two 100-year flood events, or even two 500-year flood events occur within years, or even months, of each other.

The 100-year flood is the standard used by the NFIP in determining whether flood insurance is required. FEMA’s Flood Insurance Rate Maps (FIRM) shows the 100-year floodplain based on existing conditions at the time of map preparation. The 100-year flood is also referred to as the “base flood.” The 100-year floodplain is designated as ‘Zone A’ on the FIRMs for the HMP planning area jurisdictions that have 100-year floodplain areas. Figure 3-2 shows the relationship between a river and its floodplain, specifying a 100-year floodplain as ‘Floodplain’.

Figure 3-2: 100-Year Floodplain



Source: Illinois Department of Natural Resources
<http://dnr.state.il.us/owr/resman/Downloads/IL%20FPM%20Quick%20Guide.pdf>

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Flash Floods Flash floods are quickly developing floods that occur as the result of the rapid accumulation of large quantities of precipitation, usually from intense thunderstorms. Flash floods are particularly dangerous because of their quick onset and possibility of occurring with little warning. While intense precipitation is the most common cause of flash flooding, dam failure can cause the most catastrophic flash floods. Flash flood waters move at extremely rapid speeds. They can damage crops, move boulders, uproot trees, and destroy bridges and infrastructure, and cause severe erosion. Figure 3-3 shows an extreme (non-local) example of the quick onset and rapid speed of flash flooding and how a road can be rendered impassable.

Figure 3-3: An Example of Flash Flooding



Source: NASA Water Management Project Office.
http://wmp.gsfc.nasa.gov/Wiring_Diagrams/FlashFlood2.jpg

Overland Floods and Ponding Overland floods and ponding occur outside of rivers or streams as the result of water accumulating in poorly draining soils or in low lying areas. Overland flooding may be the result of heavy precipitation, snow melt, or broken water lines, amongst other causes. Overland flooding can lead to the accumulation and pooling of water, a phenomenon known as ponding. Ponding can disrupt transportation by making roads impassable, damage crops, and contribute to erosion. Figure 3-4 depicts an example (non-local) of ponding in a wooded area.

Figure 3-4: An Example of Ponding



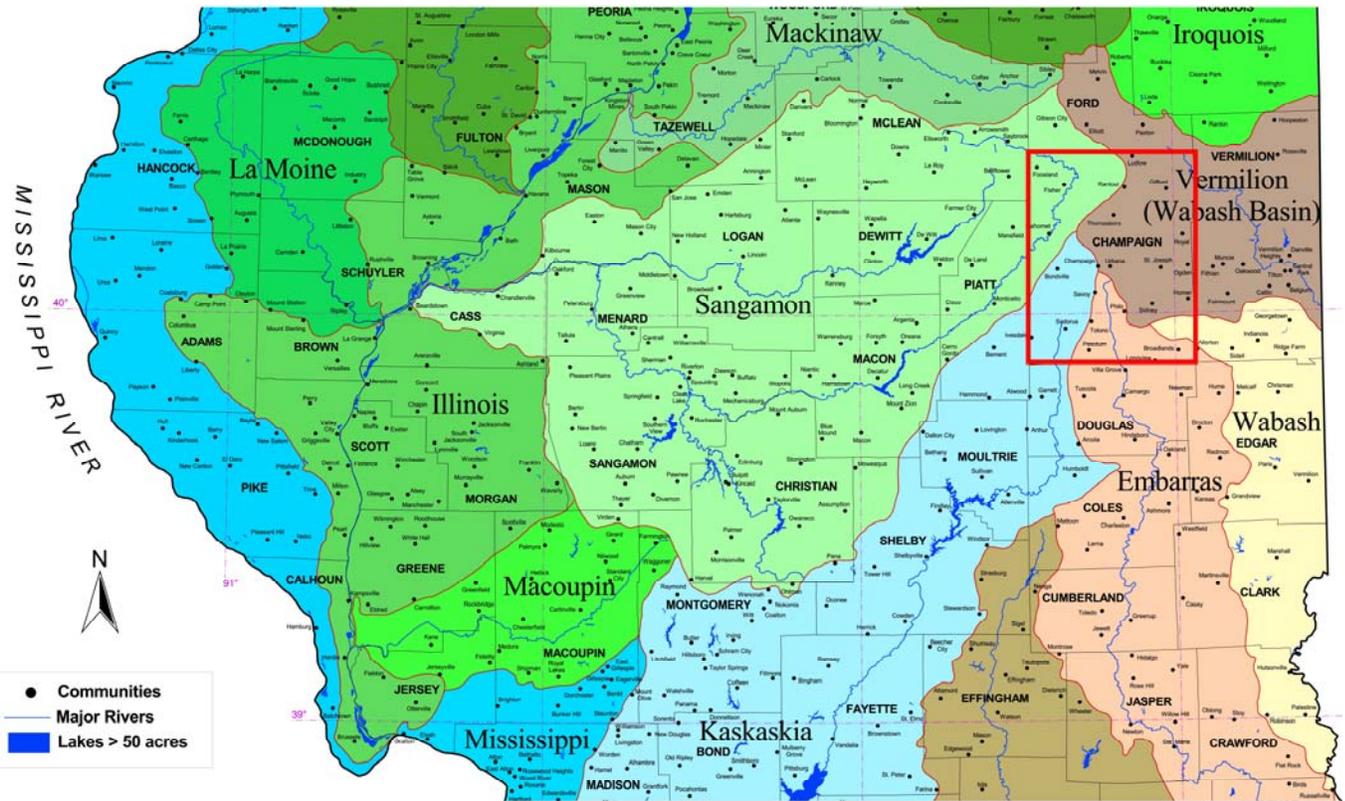
Source: Medina County Soil and Water Conservation District
<http://medinaswcd.org/images/backyard%20ponding.jpg>

One of the major factors which determines where flooding will occur is the location and capacity of watersheds. Champaign County is unique, as it is the only county in Illinois that contains five different watersheds:

- Kaskaskia River
- Vermillion River (Wabash Basin)
- Wabash River
- Embarras River
- Sangamon River

Figure 3-5 below shows the major watersheds in Central Illinois; Champaign County (depicting the HMP planning area) is highlighted.

Figure 3-5: Major Watersheds of Central Illinois



Source: Illinois State Water Survey
<http://www.sws.uiuc.edu/iswsdocs/maps/ISWSMS2000-01.pdf>

Consequences of Floods Flooding can disrupt transportation, cause property damage, crop damage, injuries and deaths.

Locations Affected by Floods Based on FEMA Flood Insurance Rate Maps (FIRM), each HMP participating jurisdiction listed below contains areas that are inside the 100-year flood plain. Therefore, these are the HMP participating jurisdictions that are at risk for ‘riverine’ or ‘overbank’ floods:

- Village of Bondville
- City of Champaign
- Village of Fisher
- Village of Mahomet
- Village of Rantoul
- Village of Royal
- Village of Sadorus
- Village of Sidney
- Village of St. Joseph
- City of Urbana
- Unincorporated Champaign County

Portions of all jurisdictions participating in the HMP are at some risk from some amount of flash flooding and overland flooding, depending on local ground elevations.

The low relief of Champaign County, its position at the intersection of drainage divides, and its glacially derived soils cause it to be poorly drained. Flood depths in the majority of areas in the County are less than five feet.

The Table 3-7 summarizes high water discharges and elevations for major streams at United States Geological Survey (USGS) stream gauges.

Table 3-7: 100-Year and Record Discharges on Gauged Streams in Champaign County

Stream & Gauge Location	100 Year Estimate			Record Flood			
	Discharge (Cubic Feet per Second)	Flood Stage (Feet)	Flood Elevation	Year	Discharge (Cubic Feet per Second)	Flood Stage (Feet)	Flood Elevation
Embarass River at Villa Grove	10,370		650.9	1950			648.2
Kaskaskia River Near Pesotum	4,540				3,310	15.92	
Salt Fork River at CR 1850 N	8,000	16.9	665.3				
Salt Fork River Near Ill. Rt. 49	10,900	14.0			10,100	15.69	
Sangamon River Near Fisher	10,619			1994	>15,000	21.59	
Sangamon River Near U.S. Rt. 150	16,400	20.0	685.8	1994	NA	22.3	

Source: Champaign County Hazard Mitigation Plan, 1997

History and Extent of Previous Occurrences

Champaign County has been a part of two federally declared flood disasters:

- In 1994, large scale flooding in 16 Illinois counties, including Champaign County, led to a federal emergency declaration. Heavy rains fell over a two-day period in April of that year and resulted in excess of \$50 million in damages to homes, businesses, and property in the County. This is the most damaging flood in recent years affecting Champaign County and other Central Illinois areas.
- Most recently, occurring between April 21 and May 3, 2002, a series of severe storms produced tornados and flooding that caused widespread damage to 68 counties in Central and Southern Illinois, including Champaign County.

In total, between 1993 and 2007, there were 21 separate flood events in Champaign County. The following descriptions come from NCDC storm event database records:

- **August 12, 1993 – Champaign, Urbana and Savoy – Flash Flood**
According to the NCDC storm events database, a record 6.49 inches of rain fell in the Champaign-Urbana area, most of it falling in a 2.5 hour period. This large rainfall caused flash flooding. Highway 45 south of Savoy was closed due to flooding of the Phinney Branch. Many homes and roads were flooded.
- **April 11, 1994 - Champaign, De Witt, Douglas, Macoupin, Montgomery, Piatt, Sangamon, Vermilion Counties - Flash Floods**
NCDC records indicate that very heavy rain fell over most of central Illinois on April 11th and 12th. The rainfall amounts ranged from 1.40 inches to 5.28 inches in less than six hours at

April 11, 1994 - Champaign, De Witt, Douglas, Macoupin, Montgomery, Piatt, Sangamon, Vermilion Counties - Flash Floods continued

most locations. Numerous homes were damaged by flash flooding and many roads were closed due to flooding. While there were no reported injuries in Champaign County, two people died after trying to drive their cars across flooded roadways in other counties. One occurred near White Oak in Montgomery County sometime after 0530 CST on the 11th. A man was travelling north when his car went off the road into Horse Creek. The second fatality occurred west of Thayer in Sangamon County at 0430 CST. The car was crossing a bridge over a branch of Sugar Creek when it was swept 50 yards into the flooded stream. In total there was an estimated \$50 million in property damage over the eight-county region.

- **May 10, 1996 – Broadlands Area – Flash Flood**

The NCDC states that an intense chain of thunderstorms dumped in excess of four inches of water in a three hour period over southern portions of Champaign County. Five houses in Broadlands sustained major damage, and 29 homes sustained minor damage. The local high school was also inundated with water and sustained damage. Several roads were flooded and access to Broadlands was cut off for several hours. Portions of Highways 49 and 130 were also closed for several hours. There were no injuries sustained in this event, but the property damage was estimated at \$200,000.

- **May 19, 1998 – Broadlands Area – Flash Flood**

A series of thunderstorms moved across southeast Champaign, southern Vermilion, and northern Edgar Counties over a three-hour period. The storms dropped between 2.5 and 5 inches of rain during this time, which resulted in numerous roads in the area being flooded. In Broadlands, the school had a couple of inches of standing water, and one of the school's storage buildings had a foot of water in it. A grocery store and two houses in the town were also damaged. Further, water damaged the local grain elevator, as a couple of motors on the drying equipment for the elevator were destroyed. The total damage in Champaign County was estimated at \$80,000; no injuries were reported.

- **August 3, 1998 – Thomasboro – Flash Flood**

According to the NCDC, a series of thunderstorms moved across northern Champaign and Vermilion Counties. During this storm, between four and six inches of rain fell over a three-hour period. Numerous roads were flooded in the area, and several motorists had to be rescued after driving into flooded roadways. No injuries were reported.

- **August 5, 1998 – Royal – Flash Flood**

The NCDC records indicate that a series of thunderstorms dumped three inches of rain in a short period of time. Several roads in the Royal area were flooded. Further, three homes in the village had water in their basements. No injuries or monetary damage estimates were reported.

- **February 24, 2001 – Countywide – Flash Flood**

The NCDC states that local officials reported having to barricade numerous roads, particularly in the northern portion of the County. No injuries or monetary damage estimates were reported.

- **April 19, 2002 – Southeast Portion of the County – Flash Flood**

NCDC storm events database records indicate that over six inches of rain fell in a short period of time in the southeastern portion of the County between Pesotum and Broadlands. Numerous roads in the area were flooded, and several were washed out. No structural damage or injuries were reported.

- **May 7, 2002 – Broadlands – Flash Flood**
 There is not a lot of information available about this event. Several roads in the Broadlands area were flooded for a brief time due to heavy rains. No structural damage was reported.
- **May 12 -13, 2002 – Champaign, Christian, Clark, Clay, Coles, Crawford, Cumberland, Douglas, Effingham, Jasper, Lawrence, Macon, Morgan, Moultrie, Piatt, Richland, Sangamon, Shelby, Vermilion Counties – Flood**
 The NCDC says that this flood event was the culmination of several days of rain. The flooding affected a large portion of the state. The southern portion of Champaign County was most impacted by this event. The Broadlands School had to put sandbags around it to keep water out of the building. East of Sidney, an elderly couple drove into a flooded section of road and had to be rescued by a nearby farmer. There is no record of injury or property damage.
- **May 28, 2002 –City of Champaign – Flash Flood**
 The Storm Events Database records indicate that isolated thunderstorms dropped several inches of rain in a short amount of time in Sangamon, De Witt, and Champaign Counties. In the City of Champaign, several roads were flooded as a result of this storm. No property damage or injuries appear in the records.
- **August 19, 2002 – North Portion of the County – Flash Flood**
 Up to eight inches of rain fell on the northern half of Champaign and Vermilion Counties according to the NCDC. Numerous roads were flooded. The flooding was particularly bad in the Hoopeston area in Vermilion County; three homes had water in their living areas as a result of this event. The records do not show any damage or injuries for Champaign County.
- **August 22, 2002 – North Portion of the County – Flash Flood**
 The Storm Events Database states that between two and five inches of rain fell in a short amount of time. Numerous roads were flooded. No structures were affected, nor injuries reported.
- **May 10, 2003 – Countywide – Flash Flood**
 NCDC records say that very heavy rains fell countywide on ground that was already saturated. Numerous roads were flooded. There is no indication of property damage or injuries.
- **July 9, 2003 – Countywide – Flash Flood**
 Records from the storm events database indicate that very heavy rains fell for several hours across Champaign County. Many streets and roads were flooded. The Urbana Fire Department had to rescue a man from the roof of his car after he drove into a flooded underpass. No property damage or injuries were reported.
- **June 11, 2004 – Tolono – Flash Flood**
 The storm event database indicates that heavy rains caused roads in the Tolono area to flood. The records do not report any injuries or damage to property.
- **July 13, 2004 – Champaign and Urbana – Flash Flood**
 Streets in Champaign and Urbana flooded because of substantial rains according to the NCDC. There was no reported property damage or injuries.

- **September 14, 2004 – City of Champaign – Flash Flood**
 According to the storm events database two to three inches of rain fell on the City of Champaign area over a short period of time. The heavy rains caused an underpass in the City of Champaign to become impassable, with three to four feet of water on the roadway. There was no indication of injuries or property damage.
- **January 15, 2005 – Mahomet – Flash Flood**
 There is very little information available about this event. The Storm Events database states only that U.S. 150 had water flowing over the road. There is no indication about the cause of the water on the roadway, nor if there were any injuries or property damage as a result of this event.
- **July 26, 2006 – Rantoul – Flash Flood**
 The Storm Events Database says that the U.S. Highway 136 underpass was flooded and impassable. There was also three to four inches of standing water on side streets. There was no reported property damage or injuries.
- **July 27, 2006 – City of Champaign – Flash Flood**
 NCDC records indicate that several roads in town flooded and had to be closed, including Kirby, Neil, and Vine streets. There were no reported injuries or property damage.

Probability of Future Flood Events

Over the 15-year period from 1993, the earliest year that the NCDC storm event database provides data on flooding, through 2007, there were 21 different flood events occurring in ten different years in Champaign County. This would indicate an estimated 67% probability that there will be a flood event in the County in any given year. In this same time period, there were six different years in which there was more than one flood event in the County. This suggests that there is an estimated 40% chance that there will be more than one flood event in any year.

**Hazard Profile:
 Extreme Heat**

Extreme heat is a natural hazard with deadly potential, since it can kill by pushing the human body beyond its limits. The INHMP describes this natural hazard as follows: “Extreme heat for a region is temperatures that hover 10 degrees or more above the average high temperature for several weeks.”

Extreme heat is most dangerous to children, the elderly, and those who are sick or overweight. Heat becomes dangerous when it exceeds the body’s ability to cool itself by sweating. A condition of high humidity level plus extreme heat can cause greater strain on the human body. The combination of extreme heat and high humidity adversely affects the body’s ability to cool itself through perspiration. Table 3-8 published by FEMA contains some common heat-related terms.

Table 3-8: Extreme Heat Terms

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

The National Weather Service uses the following 'extreme heat' categories for the purposes of issuing early warnings, which is important for minimizing the impacts of extreme heat:

- *Excessive Heat Outlook:* when the potential exists for an excessive heat event in the next three to seven days. An outlook is used to indicate that a heat event may develop. It is intended to provide information to those who need considerable lead time to prepare for the event, such as public utilities, emergency management and public health officials.
- *Excessive Heat Watch:* when conditions are favorable for an excessive heat event in the next 12 to 48 hours. A watch is used when the risk of a heat wave has increased, but its occurrence and timing is still uncertain. It is intended to provide enough lead time so those who need to set their plans in motion can do so, such as those in charge of implementing individual city excessive heat event mitigation plans.
- *Excessive Heat Warning/Advisory:* when an excessive heat event is expected in the next 36 hours. Both are issued when an excessive heat event is occurring, is imminent, or has a very high probability of occurrence. The warning is used for conditions posing a threat to life or property. An advisory is for less serious conditions that cause significant discomfort or inconvenience and, if caution is not taken, could lead to a threat to life and/or property.

Heat index is the perceived temperature that is felt when factoring in the air temperature and the relative humidity. Table 3-9 shows the heat index levels associated with heat-related illnesses.

Table 3-9: Heat Index and Heat Sickness

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

Source: National Weather Service

Consequences of Extreme Heat Extreme heat poses a health risk, particularly to children and the elderly. With regard to crop damage, the combination of extreme heat and dry weather can cause significant yield losses of crops if the extreme heat conditions exist during corn pollination, or during the flowering and pod fill stages of soybean crops.

Locations Affected by Extreme Heat All of the jurisdictions and locales in the HMP planning area are at risk from extreme heat.

History and Extent of Previous Extreme Heat Occurrences The impacts of extreme weather vary from year to year. The NCDC database shows that there have been 12 heat related deaths in Central Illinois from 1996 to the present. From July 12-17, 1995, a heat wave was responsible for many fatalities. According to the INHMP, heat was listed as an underlying or contributing factor in the death of 702 individuals statewide. The INHMP ranks the risk of extreme heat to Champaign County as 'elevated', which is the median of five ranks.

Probability of Future Extreme Heat Events It is extremely difficult to predict the probability of a future extreme heat event.

**Hazard Profile:
 Drought**

Drought is defined by the *Climate Atlas of Illinois* as: “a period of abnormally dry weather sufficiently long to cause serious impacts on agriculture, water supplies, and other activities in the affected area.”

Drought is a temporary climatic phenomenon which can affect small areas or entire regions. According to the INHMP, weather conditions, soil moisture, runoff, water table conditions, water quality and streamflow are all natural factors that are important in determining drought. High temperature, high wind and low relative humidity can significantly aggravate its severity. Drought is caused by a lower than average amount of precipitation over an extended period of time. There is no single universally accepted definition of drought, but the INHMP offers four operational definitions:

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

Consequences of Drought The main impacts of drought are the potential damage it can cause to crops and the reduction of water supply. Drought is threatening to Champaign County since it contains a large amount of agricultural land. A significant number of outlying rural residents in the HMP planning area rely on private water wells to shallow aquifers that are vulnerable to drought conditions. Rural residents with no alternate plan for obtaining water during a drought may need to haul water in the event their well runs dry.

Locations Affected by Drought. All of the jurisdictions and locales in HMP planning area are at risk from drought. Drought often affects geographical areas that are larger than the HMP planning area.

History and Extent of Previous Droughts In 1983, all 102 counties in the State were affected by drought, leading to a federal emergency declaration. In 1988, another drought impacted nearly half of the state, including Champaign County, causing significant crop losses in Champaign County. Champaign County was also hit by the 2005 drought, which was particularly hard on farmers, and was within the top three most severe droughts in the 112 years for which records exist. Most recently, Champaign County was included in a group of 61 counties that were declared a natural disaster area due to a drought which occurred as the result of well below average rain between April 1 and December 31 of 2007.

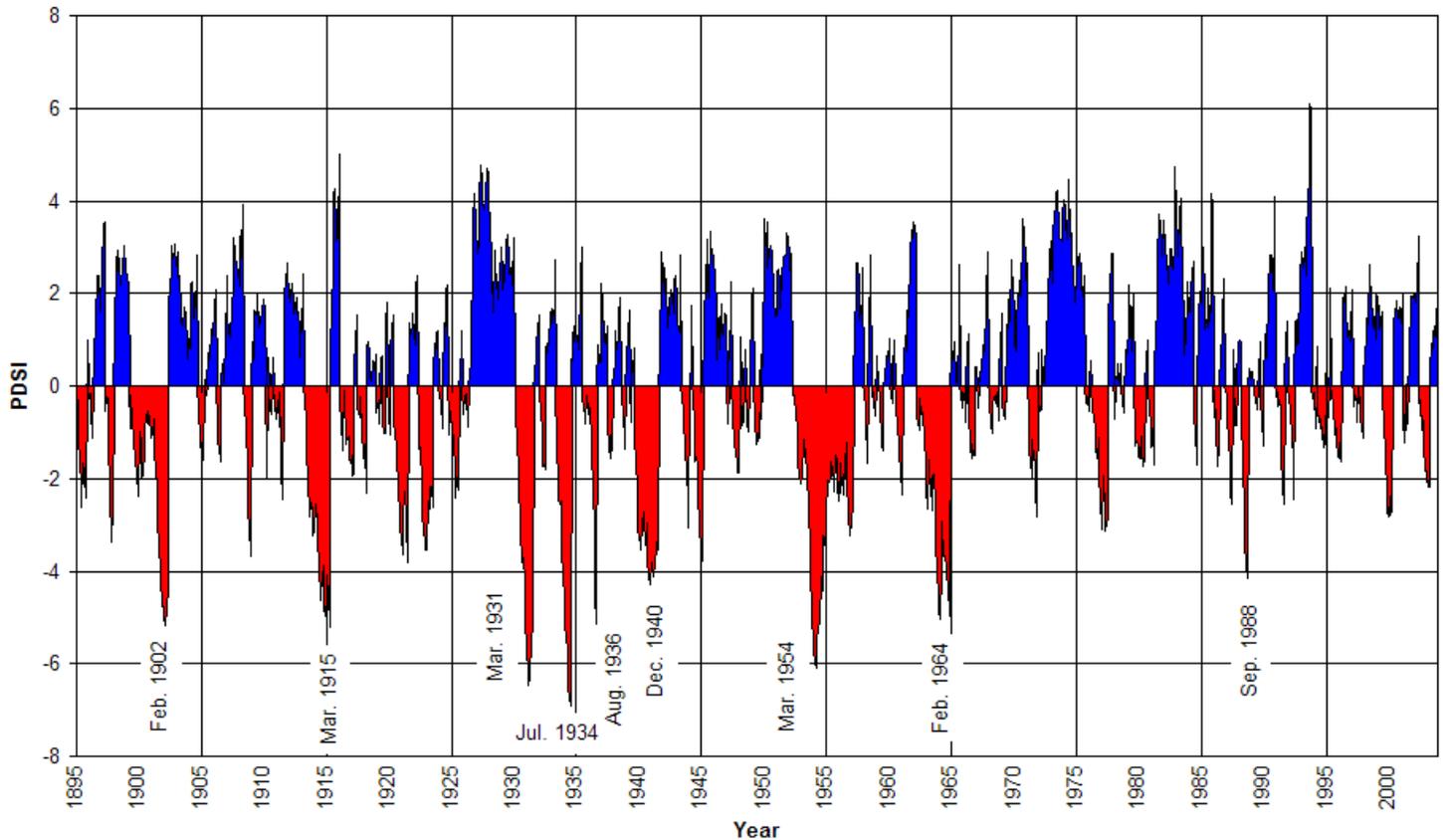
Measuring Drought Trends

The Illinois State Climatologist Office maintains a website regarding drought trends in Illinois: <http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html#datadesc>. The website describes the Palmer Drought Severity Index (PDSI) as a meteorological drought index used to assess the severity of dry or wet spells of weather:

“ The PDSI ... is based on the principles of a balance between moisture supply and demand. Man-made changes were not considered in this calculation. The index generally ranges from -6 to +6, with negative values denoting dry spells and positive values indicating wet spells. There are a few values in the magnitude of +7 or -7. PDSI values 0 to -.5 = normal; -0.5 to -1.0 = incipient drought; -1.0 to -2.0 = mild drought; -2.0 to -3.0 = moderate drought; -3.0 to -4.0 = severe drought; and greater than - 4.0 = extreme drought. Similar adjectives are attached to positive values of wet spells. “

Drought trends in Illinois, including the recorded ‘extreme drought’ occurrences (with a PDSI value of greater than -4.0) are indicated on the Palmer Drought Severity Index for Illinois shown in Figure 3-6.

Figure 3-6: Palmer Drought Severity Index - Illinois



Source: <http://www.ncdc.noaa.gov/oa/climate/research/monitoring.html#datadesc>

Probability of Future Drought Events The Illinois State Climatologist Office indicates that droughts are too difficult to forecast with present technology and available knowledge:

“The persistence of drought from one season to the next in Illinois is not as high as in other parts of the U.S., especially the West where multi-year droughts are common. Therefore, the ability to predict the onset or continuation of a drought is more problematic. Recent advances in our understanding of large-scale atmospheric and oceanic circulation features, such as El Niño and the Pacific Decadal Oscillation, may lead to some small degree of skill in predicting drought one or two seasons ahead. On the longer scale of multi-decades, no skill has been shown in forecasting drought, even with the application of so-called drought/solar cycles. As global and regional climate models improve we may begin to realize the ability to predict changes in frequency, intensity, or location of drought.”

**Hazard Profile:
 Earthquake**

Earthquakes occur when there is an abrupt shift in massive rock plates along fractures in the earth called faults. When these massive sections of rock move along a fault the energy released causes the earth to shake, potentially causing damage to structures. The point at which an earthquake occurs beneath the surface of the earth is called the hypocenter. Directly above the hypocenter on the surface of the earth is the epicenter of the earthquake.

Consequences of Earthquakes Earthquakes can cause damage to structures, injuries, and deaths. The size of an earthquake event is described in two ways: by its magnitude and intensity.

An earthquake's magnitude is a measure of the seismic energy it generates. Magnitude is often calculated using a seismograph and is reported using the Richter Scale. Richter Scale magnitude is a number between 1 and 10, followed by a decimal. The Richter Scale is a base 10 logarithmic scale, meaning a magnitude 4.0 earthquake is ten times more intense than a magnitude 3.0, and a 5.0 is ten times more intense than 4.0.

An earthquake's intensity is the measure of an earthquake's impact on people, manmade structures, and natural structures. The most commonly used intensity scale is the Modified Mercalli Intensity Scale. Table 3-10 describes the 12 levels of the Modified Mercalli Intensity scale.

Table 3-10: Modified Mercalli Intensity Scale

Mercalli Intensity	Equivalent Richter Magnitude	Witness Observations
1	1.0 to 2.0	Felt by very few people; barely noticeable.
2	2.0 to 3.0	Felt by a few people, especially on upper floors.
3	3.0 to 4.0	Noticeable indoors, especially on upper floors, but may not be recognized as an earthquake.
4	4.0	Felt by many indoors, few outdoors. May feel like a heavy truck passing by.
5	4.0 to 5.0	Felt by almost everyone, some people awakened. Small objects moved. Trees and poles may shake.
6	5.0 to 6.0	Felt by everyone. Difficult to stand. Some heavy furniture moved, some plaster falls. Chimneys may be slightly damaged.
7	6.0	Slight to moderate damage in well built, ordinary structures. Considerable damage to poorly built structures. Some walls may fall.
8	6.0 to 7.0	Little damage to specially built structures. Considerable damage to ordinary buildings, severe damage to poorly built structures. Some walls collapse.
9	7.0	Considerable damage to specially built structures, buildings shifted off of foundations. Ground cracked noticeably. Landslides.
10	7.0 to 8.0	Most masonry and frame structures and their foundations destroyed. Wholesale destruction. Large landslides.
11	8.0	Few, if any, structures standing. Bridges destroyed. Wide cracks in ground. Rails bent.
12	8.0 or greater	Total Damage. Lines of sight distorted. Objects thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move position.

Locations Affected by Earthquakes There is no history of damage caused by earthquakes in the HMP planning area. However, all of the HMP planning area is at risk from earthquake damage, should a large earthquake occur in the New Madrid or Wabash Valley Seismic Zones.

History and Extent of Previous Earthquakes According to the INHMP, there have been 31 recorded earthquakes which have caused damage in Illinois. Most of this damage occurred in Southern Illinois. While there is no history of damage, the New Madrid Seismic Zone (NMSZ) and the Wabash Valley Seismic Zone (WVSZ), depicted in Figure 3-7, are both capable of producing earthquakes which could damage property and cause injuries or fatalities in the HMP planning area. According to the Illinois State Geological Survey (ISGS), there were 41 earthquakes within a 160 km radius of Champaign County. Most recently, an earthquake felt in Champaign County occurred at 4:40 AM on April 18, 2008. The earthquake measured 5.2 on the Richter Scale and originated in the WVSZ. The earthquake was felt in 16 states. A shake map of this earthquake is shown in Figure 3-8.

Probability of Future Earthquake Events

Estimates of the probability of future earthquake events within the HMP planning area in Illinois traditionally have been based on studies of earthquake activity that has occurred in the New Madrid Seismic Zone (situated southwest of Illinois) and the Wabash Valley Seismic Zones (situated along the southeastern edge of Illinois).

A regional estimate cited in the Illinois State Geological Survey 'Earthquake Facts' 1995 publication indicates the probability of future earthquake of magnitude 6.3 or greater at a non-specified Central U.S. location within the next 15 years as 40% - 63%, and 86%-97% within the next 50 years. The probability of a magnitude of 7.5 or greater at a non-specified Central U.S. location is 5% - 9% within the next 15 years, and 19% - 29% within the next 50 years.

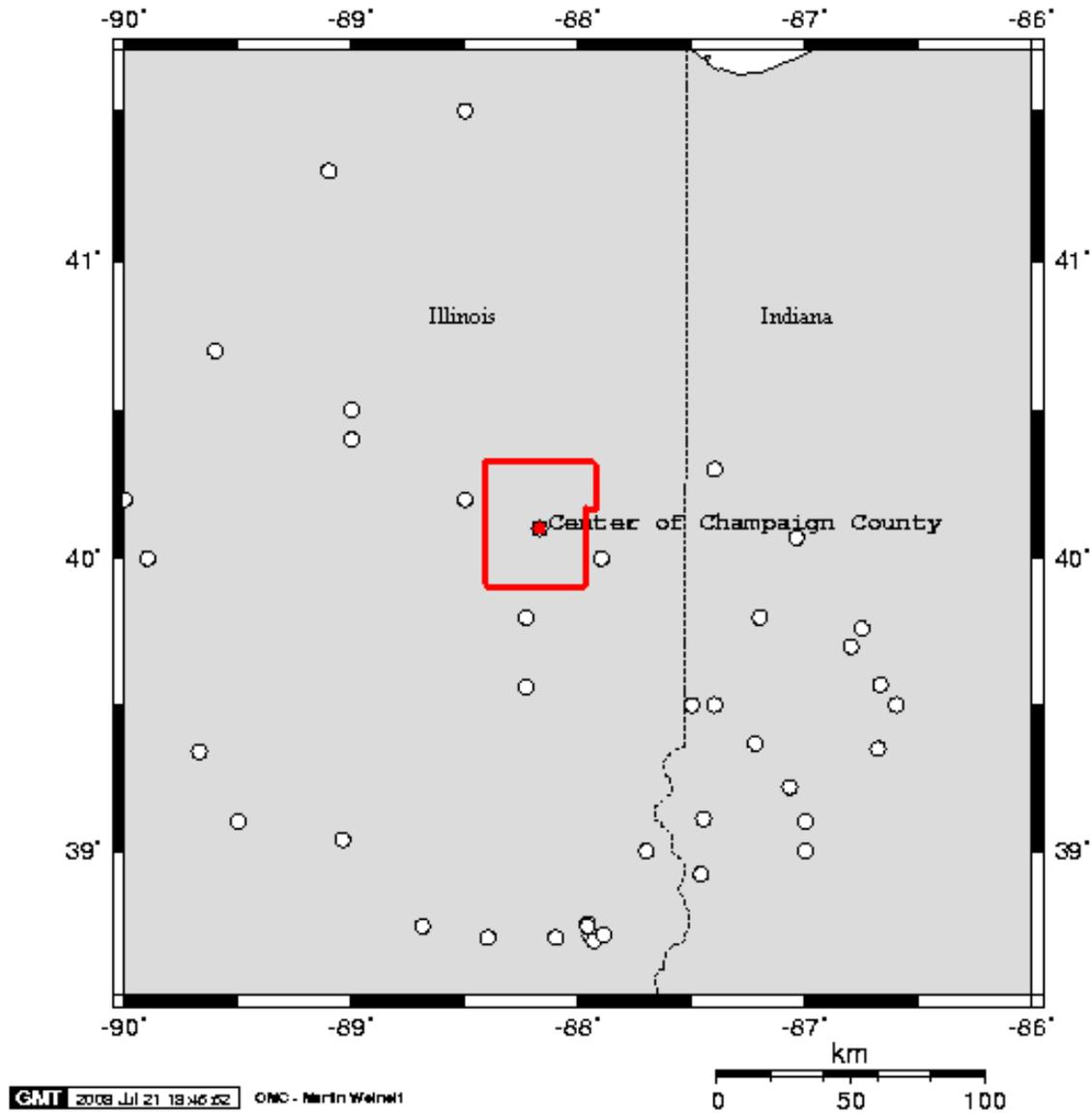
The United States Geological Survey has created a website, <http://eqint.cr.usgs.gov/eqprob/2002/index.php>, where one may request a customized earthquake probability map for a specific latitude and longitude or zip code. This website will provide a probability estimate based on the most currently available earthquake rate and probability models derived from earthquake rate, location, and magnitude data from the USGS National Seismic Hazard Mapping Project.

continued on next page

Table 3-11: Earthquakes Occurring Within 160 Kilometers of Champaign County

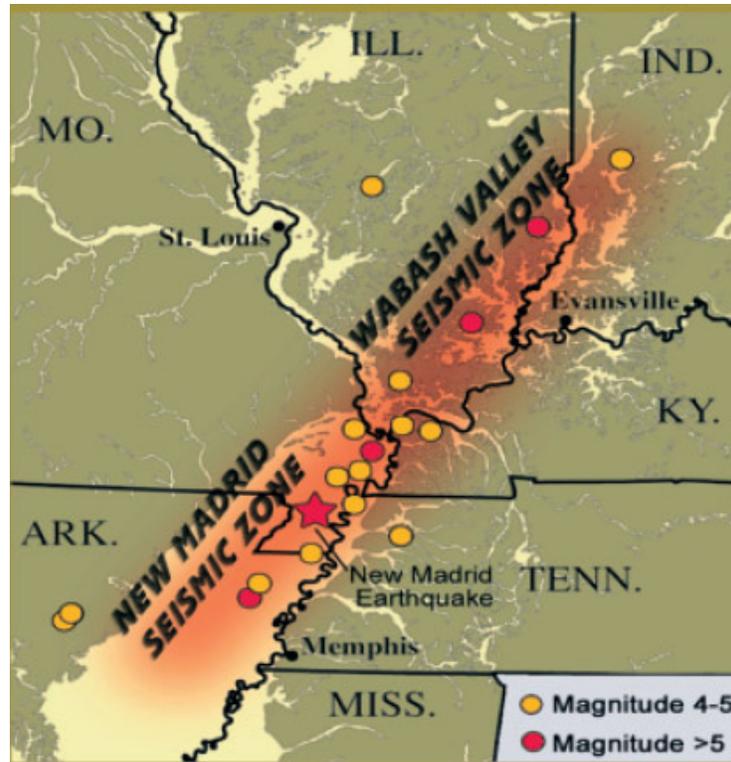
Year	Month	Day	Latitude	Longitude	Magnitude	Depth	Distance	Distance
1881	5	27	41.30	-89.10	4.6		154	96
1883	2	4	40.50	-89.00			83	52
1885	12	27	40.40	-89.00	2.9		78	48
1903	3	17	39.10	-89.50	3.0		159	99
1903	10	21	38.70	-88.10			155	96
1903	12	11	39.10	-88.50	2.5		114	71
1903	12	31	40.00	-87.90			25	16
1906	5	21	38.70	-88.40	3.4		156	97
1906	8	13	39.70	-86.80			125	78
1907	1	29	39.50	-86.60	3.4		149	93
1909	7	19	40.20	-90.00	4.5		156	97
1909	9	27	39.80	-87.20	5.4		89	55
1909	10	23	39.00	-87.70	4.2		128	80
1912	1	2	41.50	-88.50	4.7		157	98
1915	4	15	38.70	-88.10	3.8		155	96
1916	1	7	39.10	-87.00	3.8		149	93
1921	3	14	39.50	-87.50	4.5		87	54
1923	11	10	40.00	-89.90	3.3		147	91
1931	1	6	39.00	-87.00	3.5		158	98
1937	6	29	40.70	-89.60	2.5		138	86
1952	1	7	40.20	-88.50	2.9		30	19
1974	11	25	40.30	-87.40	2.4	5	69	43
1976	4	8	39.35	-86.68	3.0	20	152	94
1978	2	16	39.80	-88.23	2.7	5	33	21
1982	3	27	38.74	-88.69	2.7	15	157	98
1982	7	1	39.34	-89.67	2.6	5	153	95
1983	5	16	38.75	-87.96	2.6	20	150	93
1984	6	12	38.92	-87.46	3.4	3	144	89
1984	7	28	39.22	-87.07	4.0	10	135	84
1984	8	29	39.37	-87.22	3.2	10	114	71
1984	8	29	39.11	-87.45	3.1	10	126	78
1987	6	10	38.71	-87.95	5.1	9	155	96
1988	1	5	38.74	-87.96	3.3	5	151	94
1988	10	5	38.69	-87.93	3.6	5	157	98
1990	4	24	39.56	-88.23	3.0	10	60	37
1990	12	17	40.07	-87.04	3.2	10	96	60
1990	12	20	39.57	-86.67	3.6	10	141	88
1991	11	11	38.71	-87.89	3.8	10	155	96
1993	1	29	39.04	-89.04	3.2	5	139	86
1996	12	16	39.50	-87.40	3.1	5	93	58
2000	4	14	39.76	-86.75	3.6	5	127	79

Figure 3-7: Location of Earthquakes With Epicenters Within 160 KM of Champaign County



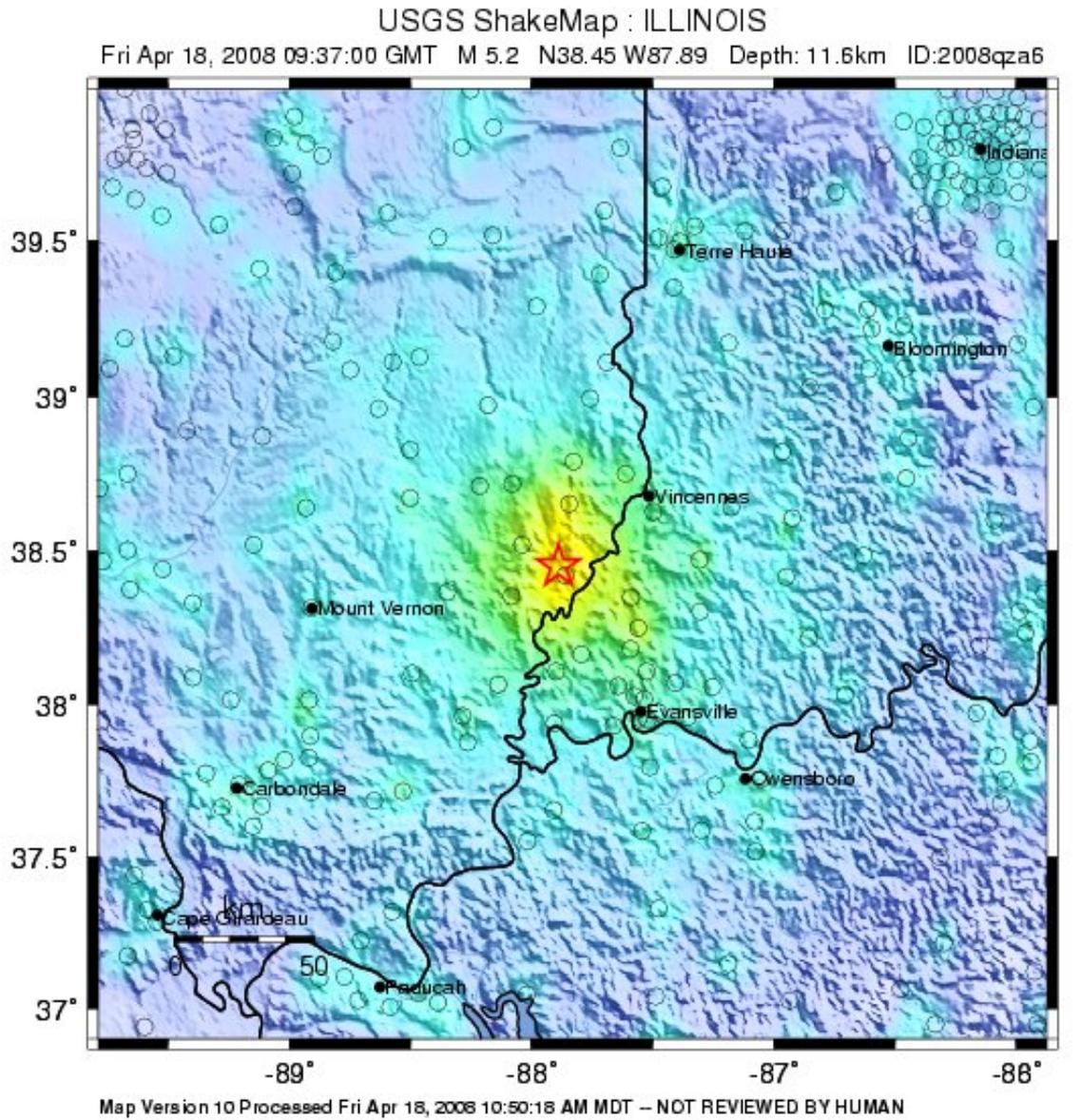
Note: Boundaries of Champaign County are approximate

Figure 3-8: New Madrid Fault Zone and Wabash Valley Fault Zone



Source: <http://www.showme.net/~fkeller/quake/images2/wabashnm.jpg>

Figure 3-9: Shake Map of the April 18, 2008 Earthquake



PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	<.17	.17-1.4	1.4-3.9	3.9-9.2	9.2-18	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	16-31	31-60	60-116	>116
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

Source: United States Geological Survey,
<http://earthquake.usgs.gov/eqcenter/shakemap/global/shake/2008qzbw/>

Natural Hazard Identification By Jurisdiction

All jurisdictions in the HMP planning area are at risk for all of the natural hazards considered to be profiled in this plan, except for one type of flooding, commonly referred to as ‘riverine flooding’ or ‘overbank flooding’, which is flooding that occurs when the waters rise above the normal water line and overflow the banks of a river, stream, or channel.

The jurisdictions of Allerton, Broadlands, Foosland, Gifford, Homer, Longview, Ludlow, Ogden, Pesotum, Philo, Savoy, Thomasboro and Tolono do not contain land that is within the 100-year flood plain. There is very little chance that normally dry areas within those jurisdictions will become inundated with water from riverine flooding that results in significant damage. However, these jurisdictions may experience less damaging flooding phenomena such as ponding or flash floods. Table 3-12 summarizes the natural hazard risks for each jurisdiction participating in the Champaign County HMP.

Table 3-12: Hazard Identification by Jurisdiction

KEY:

	Affects Jurisdiction
	Not a Hazard to Jurisdiction

Jurisdiction	Severe Storms	Earthquake	Floods		Severe Winter Storms	Drought	Extreme Heat
			Riverine Floods	Ponding or Flash Floods			
Village of Allerton							
Village of Bondville							
Village of Broadlands							
Champaign County							
City of Champaign							
Village of Fisher							
Village of Foosland							
Village of Gifford							
Village of Homer							
Village of Ivesdale							
Village of Longview							
Village of Ludlow							
Village of Mahomet							
Village of Ogden							
Village of Pesotum							
Village of Philo							
Village of Rantoul							
Village of Royal							
Village of Sadorus							
Village of Savoy							
Village of Sidney							
Village of St. Joseph							
Village of Thomasboro							
Village of Tolono							
City of Urbana							
UIUC*							
Parkland**							

Table 3-12 Notes:

* University of Illinois at Urbana-Champaign, located within City of Champaign and City of Urbana

** Parkland College, located within the City of Champaign

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Chapter 4 Vulnerability Assessment

Chapter 4 includes:

- an overview summary of the HMP planning area jurisdictions' vulnerability to the natural hazards identified in this HMP, and the potential impacts of these natural hazards to the HMP planning area jurisdictions. *FEMA requirement §201.6(c)(2)(ii)*
- a description of National Flood Insurance Program insured structures that have been repetitively damaged by floods. *FEMA requirement §201.6(c)(2)(ii)*
- a description of vulnerability in terms of the types and number of existing and future buildings, infrastructure and critical facilities located in the identified hazard areas. *FEMA requirement §201.6(c)(2)(ii) (A)*
- a description of vulnerability in terms of an estimate of the potential dollar losses to identified vulnerable structures. *FEMA requirement §201.6(c)(2)(ii) (B)*
- a general description of land uses and development trends within the HMP planning area. *FEMA requirement §201.6(c)(2)(ii) (C)*

Method Used to Assess Vulnerability

The following steps were completed in order to assess the vulnerability of HMP planning area jurisdictions to the profiled natural hazards:

1. Identify and inventory categories of property that could potentially be damaged.
2. Determine the average cost per square foot and the replacement cost for potentially damaged structures.
3. Consider the potential damage caused by each type of hazard including a general description of the economic impacts.
4. Rank the vulnerability to each threat by jurisdiction.

HAZUS software was used to provide a more detailed assessment regarding vulnerability to earthquake and flood hazards (specifically, riverine flood hazard). HAZUS is a GIS-based regional loss estimation model developed by FEMA and the National Institute of Building Sciences. HAZUS allows decision makers to specify hazard parameters to see how changing the intensity, location, or duration of a hazard event will effect the damage that is caused.

Identifying Structures, Infrastructure and Critical Facilities

Inventory of Structures All structures within the HMP planning area jurisdictions fall into seven general FEMA HAZUS software categories, based on their occupancy types and uses. Data regarding structures is current as of January 1, 2007.

1. **Residential** This group includes single family dwellings, multi family dwellings, mobile homes, temporary lodging, institutional dormitories, and nursing homes.
2. **Commercial** This group includes structures used for retail trade, wholesale trade, personal and repair services, professional/technical/business services, banks, hospitals, medical offices/clinics, entertainment & recreation, theaters, and parking.

- 3. **Industrial** This group includes structures used for light industry, heavy industry, food/drug/chemical production, high technology, and construction.
- 4. **Agricultural** This group includes structures whose main purpose is to support agricultural production.
- 5. **Religion** This group includes churches and some non-profit organizations.
- 6. **Government** This group includes government buildings that provide general services as well as government emergency response agencies.
- 7. **Education** This group includes schools/libraries and colleges/universities.

Table 4-1: Number of Structures in HMP Planning Area by General Occupancy Type

	TOTAL Structures	Residential	Commercial	Industrial	Agricultural	Religion	Government	Education
REGIONAL TOTAL ¹	73,234	67,408	3,625	790	719	337	139	216
Unincorporated ²	15,614	14,445	489	155	447	40	22	16
Village of Allerton	40	37	2	0	0	0	1	0
Village of Bondville	281	260	10	5	3	1	1	1
Village of Broadlands	231	213	10	0	4	1	2	1
City of Champaign	24,328	22,097	1,574	290	92	130	48	97
Village of Fisher	894	845	27	7	9	4	1	1
Village of Foosland	132	127	4	0	0	0	1	0
Village of Gifford	447	416	18	5	4	0	3	1
Village of Homer	671	609	36	8	7	6	3	2
Village of Ivesdale	197	182	7	3	3	0	2	0
Village of Longview	91	83	2	2	2	0	2	0
Village of Ludlow	298	288	6	0	1	1	1	1
Village of Mahomet	3,519	3,253	172	44	27	15	2	6
Village of Ogden	415	389	14	4	3	2	1	2
Village of Pesotum	293	271	7	6	6	1	1	1
Village of Philo	662	606	29	10	9	3	2	3
Village of Rantoul	5,718	5,347	251	53	22	28	4	13
Village of Royal ³	195	187	2 (8)	1	3	0 (1)	1 (2)	1 (0)

continued

Table 4-1: Number of Structures in HMP Planning Area by General Occupancy Type continued

	TOTAL Structures	Residential	Commercial	Industrial	Agricultural	Religion	Government	Education
Village of Sadorus	231	212	10	4	1	1	2	1
Village of Savoy	1,781	1,656	89	17	7	7	2	3
Village of Sidney	571	535	18	7	5	3	2	1
Village of St. Joseph	1,692	1,600	56	13	8	8	3	4
Village of Thomasboro	623	591	14	5	7	2	3	1
Village of Tolono	1,481	1,411	38	14	8	5	2	3
City of Urbana	12,829	11,748	740	137	41	79	27	57
University of Illinois ⁴								
Parkland College ⁴								

Table 4-1 Notes:

1. 'Regional Total' is used instead of 'HMP Planning Area Total' because certain census tract areas used in developing the structures inventory fall outside the HMP Planning Area boundaries. Specifically, the census tract area portions situated beyond the scope of the HMP Planning Area are situated beyond the municipal boundaries of the Villages of Ivesdale in Piatt County and the Village of Allerton in Vermillion County.
2. 'Unincorporated' includes structures in unincorporated areas of Champaign County. The FEMA HAZUS software used included the census tracts in Piatt and Vermillion Counties that extend beyond the limits of the Villages of Allerton and Ivesdale. Structures within these particular census tracts but outside of Village limits are also included in the 'Unincorporated' count.
3. The HAZUS database was found to be in error with regard to the count of structures by occupancy type other than residential for the structures located within the corporate limits of the Village of Royal. (The number shown in red in parenthesis indicates a count of structures occupied by other than a residential use in the Village as of August, 2009, based on the best available information.)
4. Structures belonging to the University of Illinois and Parkland College are already counted in the municipal jurisdictions in which they are located.

Estimating Replacement Cost for Structures

The following Tables 4-2, 4-3, and 4-4 display the average replacement cost for each structure type in the HMP planning area. The average replacement cost represents an estimate of cost to replace a structure that is destroyed by a hazard event. These estimates are derived from FEMA HAZUS software and are based on *2006 RS Means Building Construction Cost Data*, a widely referenced source of construction cost data used in budgeting and estimating.

Table 4-2: Average Structure Replacement Cost by Specific Occupancy Type

	Average Cost Per Square Foot (dollars)	Average Size (square feet)	Average Replacement Cost (dollars)
Residential			
Single Family Dwelling (Refer to Table 4-3)			
Mobile Home	35.75	1,063	38,002
Multi Family Dwelling (Refer to Table 4-4)			
Temporary Lodging	132.52	135,000	18,295,200
Institutional Dormitory	150.96	25,000	3,774,000
Nursing Home	126.95	25,000	3,173,750
Commercial			
Retail Trade	82.63	110,000	9,089,300
Wholesale Trade	75.95	30,000	2,278,500
Personal and Repair Services	102.34	10,000	1,023,400
Professional/Technical/Business Services	133.43	80,000	10,674,400
Banks	191.53	4,100	785,273
Hospital	224.29	55,000	12,335,950
Medical Office/Clinic	164.18	7,000	1,149,260
Entertainment & Recreation	170.51	5,000	852,550
Theaters	122.05	12,000	1,464,600
Parking	43.72	145,000	6,339,400
Industrial			
Heavy	88.28	30,000	2,648,400
Light	75.95	30,000	2,278,500
Food/Drugs/Chemicals	145.07	45,000	6,528,150
Metals/Minerals Processing	145.07	45,000	6,528,150
High Technology	145.07	45,000	6,528,150
Construction	75.95	30,000	2,278,500
Agriculture			
Agriculture	75.95	30,000	2,278,500
Religion/Non/Profit			
Church/Membership Organization	138.57	17,000	2,355,690
Government			
General Services	107.28	11,000	1,180,080
Emergency Response	166.59	11,000	1,832,490
Education			
Schools/Libraries	115.31	130,000	14,990,300
Colleges/University Building	144.73	50,000	7,236,500

Source: FEMA HAZUS software

Table 4-3: Average Replacement Costs for Single Family Dwellings

Home Type	No Basement	Unfinished Basement	Finished Basement
Average Replacement Cost Per Square Foot (dollars)			
1 Story Economy	65.91	73.01	85.21
2 Story Economy	70.13	74.78	81.23
3 Story Economy	70.13	74.78	81.23
Split Level Economy	64.46	69.96	78.36
1 Story Average	92.84	101.29	116.89
2 Story Average	90.15	95.60	105.70
3 Story Average	94.49	98.74	106.84
Split Level Average	84.96	91.46	103.41
1 Story Custom	114.91	130.36	154.46
2 Story Custom	112.91	122.11	135.81
3 Story Custom	116.99	123.84	133.79
Split Level Custom	105.25	116.60	133.80
1 Story Luxury	139.76	152.96	183.51
2 Story Luxury	133.09	143.19	158.84
3 Story Luxury	137.08	144.68	156.08
Split Level Luxury	124.81	137.26	156.71

Table 4-4: Average Replacement Costs for Multi-Family Dwellings

Home Type	Average Replacement Cost Per Square Foot (dollars)	Average Size (square feet)	Average Replacement Cost (dollars)
Duplex	79.48	3,000	238,440
Triplex/Quads	86.60	3,000	259,800
Apartment 5-9 Units	154.31	8,000	1,234,480
Apartment 10-19 Units	137.67	12,000	1,652,040
Apartment 20-49 Units	135.39	40,000	5,415,600
Apartment 50+ Units	131.93	60,000	7,915,800

Critical Facilities Critical facilities are buildings or infrastructure considered as vital to protect from the adverse impacts of a natural hazard by means of mitigation. Within the HMP planning area, if a facility met one or more of the following criteria, it was identified as a critical facility:

- a facility which is essential to managing and responding to a hazard event;
- a facility which houses or contains vulnerable populations, specifically children or the elderly;
- a large place of assembly; or
- a facility that contains hazardous materials.

The facilities within the HMP planning area that are considered critical are listed in their general categories as follows:

Essential Facilities

Emergency Facilities, including: Police Stations; Fire Stations; Hospitals; Emergency Management Agencies / Emergency Service & Disaster Agencies

Utility Lifelines

Potable Water Facilities (e.g., water tower, public well station); Waste Water Facilities (e.g., public sewage treatment plant); Electrical Substations; Natural Gas Facilities; Natural Gas Pipelines; Radio & Television Stations

Transportation Lifelines

Railway Facilities & Railway Bridges; Bus Facilities; Highway Bridges & Highway Tunnels; Airports; Heliports

High Potential Loss Facilities

Military Installations; Dams & Levees; Hazardous Material Facilities

Facilities of Local Importance

Schools (excluding residential home schools); Day Care Centers; Nursing Homes; Retirement, Assisted and Supported Living Facilities; Subsidized Senior Apartments; Senior Centers; Libraries; Movie Theaters; Stadiums; Correctional Facilities; Selected Government Buildings

The following table displays a count for the number of each type of critical facility identified in each jurisdiction that participated in HMP planning.

continued on next page

Table 4-5: Number of Critical Facilities by Jurisdiction

	Essential Facilities	Utility Lifelines	Transportation Lifelines	High Potential Loss Facilities	Facilities of Local Importance	Total Count of Critical Facilities
REGIONAL TOTAL ¹	74	83	843	18	223	1241
Unincorporated ²	0	1	700	0	0	701
Village of Allerton	1	0	0	0	1	2
Village of Bondville	1	1	0	0	0	2
Village of Broadlands	1	1	2	0	1	5
City of Champaign	27	10	62	7	80	186
Village of Fisher	2	3	11	0	5	21
Village of Foosland	0	0	0	0	0	0
Village of Gifford	2	1	0	1	4	8
Village of Homer	3	2	1	1	4	11
Village of Ivesdale	1	1	2	1	0	5
Village of Longview	0	1	0	0	1	2
Village of Ludlow	1	1	1	0	2	5
Village of Mahomet	6	6	14	0	13	39
Village of Ogden	0	1	1	0	3	5
Village of Pesotum	0	1	2	0	1	4
Village of Philo	0	2	0	0	3	5
Village of Rantoul	6	23	9	0	30	68
Village of Royal	1	1	0	1	2	5
Village of Sadorus	1	1	1	1	1	5
Village of Savoy	1	6	1	0	10	18
Village of Sidney	2	2	5	1	2	12
Village of St. Joseph	2	3	4	0	8	17
Village of Thomasboro	2	1	4	0	3	10
Village of Tolono	3	1	1	1	9	15
City of Urbana	14	12	24	6	46	102
University of Illinois ³						811
Parkland College ⁴						10

Table 4-5 Notes:

1. The Regional Total does not include the critical facilities of the University of Illinois or Parkland College. Refer to Notes 3 and 4 below.
2. “Unincorporated” includes structures in unincorporated areas of Champaign County. Additionally some census tracts in Piatt and Vermillion Counties include, but extend beyond the limits of the Villages of Allerton and Ivesdale. The structures within these census tracts but outside of village limits are included in the “Unincorporated” count.
3. The University of Illinois is an overlay jurisdiction. All of the University of Illinois’ 811 structures, sites and buildings are considered critical facilities. These facilities are excluded from the counts for the municipalities in which they are located.
4. Parkland College is a jurisdiction that overlays the City of Champaign. The 10 critical facilities associated with Parkland College are excluded from the City of Champaign counts.

Data Limitations

Digital Flood Insurance Rate Maps (DFIRMs) The HMP was prepared knowing that a data limitation for assessing vulnerability to flood hazards will need to be addressed in the next HMP update. DFIRMs for jurisdictions within the HMP planning area that participate in FEMA’s National Flood Insurance Program (NFIP) are presently being updated and are expected to be available during the year 2010. The forthcoming DFIRM data will include up-to-date elevations of land along the Boneyard Creek. These elevations are included on a map revision (referred to as a ‘Letter of Map Revision, or ‘LOMAR’) recently submitted to FEMA by the Cities of Champaign and Urbana. The updated elevations to be featured on the DFIRMS will allow for more accurate vulnerability assessment to flood hazards in the City of Champaign and City of Urbana.

Accurate Count of Structures within 100-Year Floodplain The FEMA HAZUS computer model bases its estimate of the number of structures impacted by the 100-year floodplain hazard on each census block and not actual placement of the structure in the 100-year floodplain. This broader inclusion of structures represents a potentially greater number of structures reported as impacted by the 100-year floodplain flood hazards. The actual number of structures located within the 100-year floodplain areas within the HMP planning area is somewhat less than the number of structures located within the census blocks that include 100-year floodplain areas.

The estimates of potential loss related to flood damages, therefore, are general estimates that are more inclusive than exclusive of structures in the area of the 100-year floodplain.

Repetitive Loss Properties

This section addresses repetitive losses on properties in identified flood hazard areas within the HMP planning area. ‘Repetitive loss structure’ is a term used by the National Flood Insurance Program (NFIP) to refer to a structure for which two or more losses of at least \$1,000 have been paid under the NFIP within any 10-year period since 1978.

Available data regarding repetitive loss structures in the HMP planning area is dated June 30, 2008. FEMA Guidance specifies that flood insurance claim information is subject to The Privacy Act of 1974, as amended. The Act prohibits public release of policy holder names, or names of financial assistance recipients and the amount of the claim payment or assistance. Based on this data, Table 4-6 displays the types and quantity of repetitive loss structures in the HMP planning area.

Table 4-6: Repetitive Loss Structures

Type of Structure	Number of Structures	Location (within or nearby the jurisdiction shown below)
Single Family Residence	1	Village of Broadlands
	2	City of Champaign
	1	Village of Fisher
	2	Village of Sidney
	2	Village of St. Joseph
Other Type of Residential	3	City of Champaign
Multi-Family Residential	3	Village of St. Joseph
Non Residential	3	City of Champaign

As noted in the previous section, the DFIRMs for jurisdictions within the HMP planning area that participate in FEMA's National Flood Insurance Program (NFIP) are presently being updated and are expected to be available in the year 2010. Once the DFIRM are available, it is expected that some of the above-noted repetitive loss properties may no longer be located within the 100-year floodplain (also known as the 'special flood hazard area').

Vulnerability Assessment: Severe Storms

All structures and people within the HMP planning area are vulnerable to severe storms. Severe storms can produce lightning, hail and tornados, which can cause damage in a variety of ways. These elements of severe storms are discussed below.

Vulnerability Assessment: Lightning

Potential Health and Safety Threat Lightning could strike anyone who is outside during a severe storm. Lightning has the capability to injure or kill any person who is struck. It also has the capability of traveling through electrical outlets and striking people and objects indoors. Lightning strikes can also cause fires which pose safety risks.

Potential Damage to Property All structures within the HMP planning area are vulnerable to lightning. The Chapter 2 hazard profile for damaging lightning indicates a seven percent chance that there will be a lightning strike which causes damage in the HMP planning area in any given year. Lightning strikes can cause fires which could completely destroy a structure. Therefore, the maximum potential damage to a structure from lightning should be the replacement cost of the entire structure. Average replacement costs for each of the seven structural types are provided in Tables 4-2; 4-3; and 4-4.

Potential Economic Impacts The types of potential economic impacts that can result from damaging lightning strikes in the HMP planning area are described below:

- Cost of emergency response and cleanup as a result of a lightning damage;
- Loss of revenue for an economic establishment that is destroyed by fire from a lightning strike;
- Loss of revenue for economic establishments whose power service is interrupted as a result of lightning causing tree limbs to fall on power lines; or
- Disruption of transportation routes as a result of downed tree debris.

Vulnerability Assessment: Hail

Potential Health and Safety Risk Hail can injure anyone who is outside during a severe storm in any of the HMP planning area jurisdictions. Although hail is not generally life-threatening, it can cause injury if a person is struck.

Potential Damage to Property The Chapter 2 hazard profile for hail storms indicates that, based on historical data, there is a 62 percent chance that there will be a severe storm which produces hail anywhere within the HMP planning area in any given year. Hail most frequently causes damage to automobiles. The potential damage associated with hail striking vehicles includes: dents to the vehicle's body; scratched paint; and broken windshields and windows.

Each of these types of damage could cause significant repair costs. In severe cases, hail can also cause damage to structures. Hail can dent or cause soft spots in the roofs of buildings with shingles, which could lead to water damage. Hail can also break out windows on structures.

Potential Economic Impacts The types of potential economic impacts that can result from a hail storm in the HMP planning area are described below:

- Loss of revenue for economic establishments while they repair broken windows and or/roofs;
- Loss of revenue for economic establishments which depend on vehicles that are rendered inoperable as the result of broken windows; or
- Crop damage.

Vulnerability Assessment: Tornadoes

Potential Health and Safety Risk Tornadoes are capable of causing injury or the death of people living in any of the HMP planning area jurisdictions. The high-speed winds associated with tornadoes can: throw a person a long distance; strike a person with ordinary objects that are turned into projectiles; or cause a structure occupied by a person to collapse.

Potential Property Damage All structures situated within the HMP planning area are vulnerable to tornadoes. The Chapter 2 hazard profile for tornadoes indicates that, based on historical data, there is a 47 percent chance that there will be a severe storm which produces a tornado in the County in any given year.

A tornado can completely destroy vehicles as well as structures. Manufactured housing, homes on crawlspaces, and structures with large spans, such as factories or malls, are at heightened risk for damage from tornadoes because of their structural characteristics. However, an F-4 or F-5 magnitude tornado is capable of destroying any structure. Therefore, the maximum potential damage to a structure from a tornado should be the structure's replacement cost. Average replacement costs for each of the seven structural types are provided in Tables 4-2; 4-3; and 4-4.

The Illinois Natural Hazard Mitigation Plan (INHMP) estimates that Champaign County will lose an average of nearly \$800,000 in property damage to tornadoes in any given year. To arrive at this estimate, the historical number of tornadoes (44) was divided by the number of years between 1950 and 2002 (53) yielding a probability of 0.83 that a tornado will occur in Champaign County in a given year. Then, the total dollar value of the damage reported from all 44 tornadoes (41.973 million) was divided by 44 to create an average monetary damage per tornado. By multiplying this average damage per tornado figure by the probability of .83, the INHMP arrived at their estimate of approximately \$800,000 in tornado damage for Champaign County in any given year. This estimate based on historical damage data places Champaign County as fifth in the state for highest estimated yearly property damage from tornadoes behind Will, Williamson, Cook, and Madison Counties, respectively.

Potential Economic Impacts The types of potential economic impacts that can result from a tornado in the HMP planning area are described below:

- Financial hardships endured by survivors as a result of loss of lives as result of a tornado
- Financial hardships due to personal or animal injuries resulting from a tornado
- Cost of emergency response and cleanup as a result of tornado damage
- Loss of revenue for economic establishments that are damaged or destroyed by a tornado

- Loss of revenue for economic establishments whose utility services are interrupted as a result of a tornado
- Disruption of transportation routes as a result of debris

Vulnerability Assessment: Severe Winter Storms

Potential Health and Safety Risks Winter storms, particularly the heavy snow fall and the cold temperatures associated with them, can cause injury or death. All residents of the County and its jurisdictions are potentially vulnerable to the effects of winter storms. These storms can include extremely low temperatures which can cause injury or death if a person has prolonged exposure to the cold.

Winter storms can also have accumulations of snow and/or ice which can cause roads to be slick and extremely dangerous for travel. Vehicular accidents are commonplace after winter storms which produce significant amounts of ice and snow. These storms can also involve blizzards which reduce visibility and make travel dangerous.

Potential Damage to Property All of the structures in the County and its jurisdictions are exposed to winter storms. Chapter 2 states that there is a 87% chance that there will be a winter storm in the County in any given year. When temperatures are below zero, water pipes can freeze and burst causing costly water damage to buildings. Ice storms can cause build ups of ice which destroy trees and cause damage to overhead electrical power lines.

Potential Economic Impacts

- Costs of clearing roads of snow and ice
- Cleanup costs of trees downed in ice storms
- Repair costs of electrical utility lines downed in ice storms
- Loss of revenue for economic establishments whose power service is interrupted as a result of ice or snow storms
- Disruption of transportation routes

Vulnerability Assessment: Floods

The vulnerability assessment of the HMP planning area jurisdictions to flood hazards was also generated by using FEMA's HAZUS software. The vulnerability assessment was conducted under the scenario that a 100-year flood event takes place in the HMP planning area.

HMP Planning Area Flood Vulnerability Assessment

The following assessment considers all the structures and property within the boundaries of the HMP planning area. Additionally, some census tracts in Piatt and Vermilion Counties include, but extend beyond the limits of the Villages of Allerton and Ivesdale. The structures within these census tracts, but outside of village limits, are included in the regional analysis, but are not included in the municipal specific numbers.

Building Damage HAZUS estimates that about 830 buildings will be at least moderately damaged in a 100 year flood event. This is over 1% of the total number of buildings in the region. Table 4-7 below summarizes the expected damage by occupancy for the buildings in the region. Table 4-8 summarizes expected damage by building type.

Table 4-7: Expected Regional Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						Total
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	3	0	0	2	0	5
Education	0	0	0	0	0	3	3
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	1	1
Religion	0	0	0	0	0	0	0
Residential	0	2	13	45	124	636	820
Total	0	5	13	45	126	640	829

* - Substantially damaged means greater than 50% of the building has been damaged

Table 4-8: Expected Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						Total
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	1	1
Manufactured Housing	0	0	0	0	0	59	59
Masonry	0	1	0	3	16	86	106
Steel	0	1	0	0	0	1	2
Wood	0	2	13	42	108	493	658
Total	0	4	13	45	124	640	826

* - Substantially damaged means greater than 50% of the building has been damaged

Building Related Economic Losses Building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

Within the HMP planning area, the total building-related losses are an estimated \$533.73 million. Less than 1% of the estimated losses were related to the business interruption. Residential occupancies made up 59.32% of the total loss. Table 4-9 provides a summary of the losses associated with the building damage in the HMP planning area.

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Table 4-9: Building Related Economic Loss Estimates
(Millions of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	206.36	34.07	5.08	27.76	273.28
	Content	109.77	62.07	8.83	73.26	253.92
	Inventory	0.00	1.33	1.46	0.89	3.68
	Subtotal	316.14	97.47	15.36	101.91	530.88
Business Interruption						
	Income	0.03	0.40	0.00	0.10	0.52
	Relocation	0.23	0.09	0.00	0.00	0.32
	Rental Income	0.14	0.06	0.00	0.00	0.19
	Wage	0.06	0.43	0.00	1.33	1.82
	Subtotal	0.45	0.97	0.00	1.43	2.85
ALL	Total	316.59	98.43	15.36	103.34	533.73

Critical Facility Damage In total, 20 critical facilities out of the 1,241 in the HMP planning area are projected to sustain damage in the 100 year flood event. Table 4-10 provides a count for the number of critical facilities damaged in each category.

Table 4-10: Count of Damaged Critical Facilities

Critical Facility Type	Number Damaged
Essential Facilities	1
Transportation Lifelines	12
Utility Lifelines	4
High Potential Loss Facilities	0
Facilities of Local Importance	4
TOTAL within HMP Planning Area	20

Essential Facilities HAZUS estimates that there will be some damage to one essential facility in the HMP planning area. An emergency operations center located in Sidney is projected to sustain heavy damage totaling approximately 1.5 million dollars. This facility will be non-functional and will not be fully restored for an estimated 630 days. There is no projected damage to police, fire department, or hospital facilities in any of the jurisdictions.

Transportation and Utility Lifelines A 100 year flood event also has the potential to damage transportation and utility lifelines. The estimated damage to transportation infrastructure is minimal. The only projected damage to transportation infrastructure is a small amount of damage to highway bridges. HAZUS estimates this damage to be around \$8,000. The projected damage to utility infrastructure within the County will affect wastewater facilities. The HAZUS model projects that four wastewater facilities will be rendered temporarily inoperable and will sustain an estimated total of \$103,419,000 in damages. These four facilities include the sewage treatment plants in Fisher, both sewage treatment plants in Mahomet, and the Northeast plant in Urbana.

High Potential Loss Facilities None of the high potential loss facilities located in the County and the participating jurisdictions are projected to sustain damage as a result of this flood event.

Facilities of Local Importance HAZUS predicts that four facilities of local importance in the County will be damaged in this flood event. Three of the facilities, including a pre-school, a high school, and another educational facility are located in Urbana. The fourth facility is a nursing home located in Champaign.

Debris Generation HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of equipment required to handle the debris. The model estimates that a total of 116,870 tons of debris will be generated. Of the total amount, finishes comprises 24% of the total, structure comprises 45% of the total, and foundations comprise the remaining 31%. If the debris tonnage is converted into an estimated number of truckloads, it will require 4,675 truckloads carrying 25 tons each to remove the debris generated by the flood.

Shelter Requirements HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2,668 households including 8,005 people will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 5,707 people (out of a total 2000 population of 186,470) will seek temporary shelter in public shelters.

The number of 2,668 households appears to be a high estimate when compared with the 820 residences that will be damaged in the flood. However, an important component in the HAZUS methodology for calculating shelter needs is not only damage to residences, but damage to utility infrastructure. In this scenario, four wastewater treatment plants have become inoperable, which means that some of the households that these plants serve will need to seek shelter elsewhere.

Jurisdiction-Specific Vulnerability Assessments Flood hazards from a 100-year flood event do not threaten all of the jurisdictions in the HMP planning area. The HAZUS model predicts that the following jurisdictions will sustain damage in a 100-year flood event:

Village of Bondville
 City of Champaign
 Village of Fisher
 Village of Foosland
 Village of Ivesdale
 Village of Mahomet
 Village of Rantoul

Village of Royal
 Village of Sadorus
 Village of Sidney
 Village of St. Joseph
 City of Urbana
 Parkland College
 University of Illinois at Urbana-Champaign
 Champaign County

Appendix 3 contains a description of vulnerability to 100-year flood hazards for each of the above noted jurisdictions. Appendix 3 includes a description of the estimated damage to each jurisdiction and a map which shows municipal boundaries and the census blocks which contain areas within the 100 year flood plain. HAZUS analyzes and calculates damage to these blocks when it produces its estimates. These blocks do not in all cases line up exactly with the municipal boundaries of the jurisdiction.

Vulnerability Assessment: Extreme Heat

Potential Health and Safety Risks All of the residents in the HMP planning area are vulnerable to extreme heat. As Chapter 2 states, extreme heat can cause ill effects ranging from fatigue, to heat cramps, to sun stroke, to death. Elderly populations and small children are at a heightened vulnerability to the effects of extreme heat.

Potential Damage to Property

Extreme heat does not usually damage structures. However, prolonged periods of extreme heat can damage crops.

Potential Economic Impacts

The potential economic impacts include heightened energy demands and utility costs to cool structures during periods of extreme heat.

Vulnerability Assessment: Drought

Potential Health and Safety Risks Droughts do not traditionally pose health and safety risks.

Potential Damage to Property Droughts do not pose a threat to structures in the HMP planning area, but droughts have the capability of causing damage to crops. It is impossible to reliably predict the probability that drought will affect the region, however as Chapter 2 states, there have been droughts in the region in the past. All of the agricultural lands in the HMP planning area are vulnerable to drought.

Potential Economic Impacts

The potential economic impacts include the loss of revenue for farmers whose crops are destroyed by drought.

Vulnerability Assessment: Earthquakes

FEMA HAZUS software allowed for a detailed analysis of the vulnerability of the HMP planning area jurisdictions to earthquakes. HAZUS was utilized in preparing the following earthquake vulnerability analyses.

For comparative purposes, two scenarios were analyzed to assess the HMP planning area’s vulnerability to earthquake damage. For the first scenario all of the historic sites of earthquakes near Champaign County were identified. HAZUS then estimated the effects of a Magnitude 5.4 earthquake occurring at the historic location of the nearest previously occurring earthquake to Champaign County. This earthquake occurred in 1909 in southwestern Vermillion County; the epicenter of this earthquake was located at a latitude of 39.80 N and a longitude of -87.20 W, approximately 39 miles east of Champaign County.

The second scenario estimated the effects of a Magnitude 5.4 earthquake occurring along the fault at the Wabash Valley Fault Zone, with the epicenter of this earthquake located at a latitude of 38.00 N and a longitude of -88.20 W. The closest point of this fault zone would be located approximately 106 miles south of Champaign County.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County

Casualties The HAZUS model indicates four possible categories of ‘Injury Severity’ due to an earthquake. Each of these injury categories is described in Table 4-11.

Table 4-11: HAZUS Injury Severity Definitions

Injury Severity	Injury Description
Severity 1	Injuries requiring basic medical aid without requiring hospitalization
Severity 2	Injuries requiring a greater degree of medical care and hospitalization, but not expected to progress to a life threatening status
Severity 3	Injuries that pose an immediate life threatening condition if not treated adequately and expeditiously. The majority of these injuries are a result of structural collapse and subsequent collapse or impairment of the occupants.
Severity 4	Instantaneously killed or mortally injured

Source: HAZUS User Manual

The HAZUS model provides casualty estimates for the Scenario 1 earthquake occurrence at three different times of day: at 2:00 AM, 2:00 PM, and 5:00 PM. The estimate regarding casualties does not vary greatly across the different time scenarios. Regarding the 2:00 PM time scenario, the model predicts that a total of 3 people within the HMP planning area will sustain category ‘Injury Severity 1’ injuries as a result of the earthquake.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued...

Building Damage The FEMA HAZUS model provides an estimate for the number of buildings of each construction type that will be damaged in the earthquake. Further, the model puts these damaged buildings into four damage categories: Slight; Moderate; Extensive; and Complete. The definition of each of these damage categories varies depending on the type of construction.

Table 4-12 provides a sample of definitions for damage to wood, light frame buildings. Table 4-13 provides a count both by construction type and by damage level of the number of buildings that will be damaged in the earthquake in the HMP planning area.

Table 4-12: Example Damage Category Definition for Wood, Light-Frame Buildings

Damage Level	Damage Description
Slight	Small plaster or gypsum board cracks at corners of door and window openings and wall-ceiling intersections; small cracks in masonry chimneys and masonry veneer.
Moderate	Large plaster or gypsum-board cracks at corners of door and window openings; small diagonal cracks across shear wall panels exhibited by small cracks in stucco and gypsum wall panels; large cracks in brick chimneys; toppling of tall masonry chimneys.
Extensive	Large diagonal cracks across shear wall panels or large cracks at plywood joints; permanent lateral movement of floors and roof; toppling of most brick chimneys; cracks in foundations; splitting of wood sill plates and/or slippage of structure over foundations; partial collapse of room-over-garage or other soft-story configurations; small foundation cracks.
Complete	Structure may have large permanent lateral displacement, may collapse, or be in imminent danger of collapse due to cripple wall failure or the failure of the lateral load resisting system; some structures may slip and fall off the foundations; large foundation cracks.

Source: HAZUS User Manual

Table 4-13: Building Damage Count by Severity and Type

Building Type	Number of Buildings for Each Damage Level				
	Slight	Moderate	Extensive	Complete	TOTAL
Wood	101	8	0	0	109
Steel	5	1	0	0	6
Concrete	7	1	0	0	8
Precast	2	1	0	0	3
Reinforced Masonry	1	0	0	0	1
Unreinforced Masonry	264	87	11	1	363
Manufactured Home	92	22	0	0	114
Region Total	472	120	11	1	604

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued....

Building-Related Economic Losses Table 4-14 displays the estimated economic losses associated with buildings and their activities that will occur as a result of the earthquake.

Table 4-14: Building-Related Economic Losses
(Values in Millions)

	Structural Damage Cost	Non-Structural Damage Cost	Content Damage Cost	Inventory Loss	Relocation Loss	Capital Related Loss	Wage Losses	Rental Income Loss	TOTAL
Region Total	\$ 1.70	\$ 2.88	\$ 0.69	\$ 0.02	\$ 0.04	\$ 0.37	\$ 0.55	\$ 0.59	\$ 6.83

Critical Facility Damage

Essential Facilities Table 4-15 shows the number of essential facilities and the predicted functionality of these facilities the day after the earthquake.

Table 4-15: Functionality of Essential Facilities at Day One

Type of Facility	Number of Facilities	Functionality % at Day One
Police Station	18	100.0
Hospital	See Table 4-16 below	
Emergency Operation Centers	7	100.0
Fire Station	56	100.0

Table 4-16 displays the total estimated number of beds for the hospitals in the region, as well as the number of beds estimated to be available at certain milestone dates after the earthquake.

Table 4-16: Functionality of Hospitals

	Total # of beds	At Day 1		At Day 3		At Day 7		At Day 30		At Day 90	
		# of beds	%								
Large Hospitals	657	657	100.0	657	100.0	657	100.0	657	100.0	657	100.0
Small Hospitals	46	46	100.0	46	100.0	46	100.0	46	100.0	46	100.0
Region Total	703	703	100.0	703	100.0	703	100.0	703	100.0	703	100.0

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued....

Utility Lifelines Table 4-17 displays the estimated damage states for the potable and wastewater facilities.

Table 4-17: Wastewater and Potable Water Facility Damage

Type of Facility	# of Facilities	Percentage of Facilities in Each Damage State			
		None	Slight	Moderate to Extensive	Complete
Wastewater	16	84%	11%	0%	0%
Potable water	47	43%	25%	0%	0%

There are 5,736 kilometers of potable water pipeline in the region. HAZUS estimates that there will be two leaks as a result of the earthquake. There are 3,422 kilometers of waste water pipelines. The model estimates one leak in waste water pipes. HAZUS does not predict that any households will be without water after this event.

Table 4-18 evaluates the earthquake’s effect on electrical power system performance in terms of households without power.

Table 4-18: Households Without Power

Total Households	At day 1	At day 3	At day 7	At day 30	At day 90
73,282	0	0	0	0	0

The following chart summarizes the expected economic cost of the damage to the various utility systems in the HMP planning area.

Table 4-19: Estimated Direct Economic Losses for Utilities
(Values in Millions)

	Potable Water	Waste Water	Oil System	Natural Gas	Electric Power	Communication	Total
Region Total	\$1.38	\$ 0.58	\$ 0.00	\$ 0.01	\$ 0.49	\$ 0.00	\$ 2.47

Transportation Lifelines The HAZUS model predicts moderate damage to transportation lifelines in the HMP planning area. Table 4-20 summarizes the estimated damage to the transportation facilities.

Scenario 1: Magnitude 5.4 at Historic Earthquake Point East of Champaign County continued....

Table 4-20: Estimated Direct Economic Losses for Transportation Lifelines
(Values in Millions)

	Highway	Railway	Bus Facility	Airport	Total
Segments	\$ 0	\$ 0.00	-	-	
Bridges	\$ 0	\$ 0.00	-	-	
Facilities	\$ 0	\$ 0.02	\$ 0.05	\$ 1.49	
Region Total	\$ 0	\$ 0.02	\$ 0.10	\$ 1.50	\$ 1.60

High Potential Loss Facilities and Facilities of Local Importance The HAZUS methodology does not allow for the estimation for high potential loss facilities and Facilities of Local Importance, as these are unique across different locales, and HAZUS does not attempt to predict average characteristics for these facilities as it does with residences or other types of structures.

Debris Generation

The HAZUS model predicts that the earthquake will not generate a significant amount of debris.

Fires Following the Earthquake

HAZUS estimates that there will be no small or large fires after the earthquake.

Shelter Requirement

HAZUS estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates six households to be displaced due to the earthquake. Of these, 1 person (out of a total (2000) population of 186,470) will seek temporary shelter in public shelters.

Scenario 2: Magnitude 5.4 in the Wabash Valley Fault Zone

Casualties The HAZUS model provides casualty estimates for three different scenarios in which the earthquake occurs at: 2:00 AM, 2:00 PM, and 5:00 PM. The casualties do not vary greatly across the different time scenarios. The HAZUS model predicts that no one in the region will be injured as a result of the earthquake.

Building Damage and Building-Related Economic Losses The model provides an estimate for the number of buildings of each construction type that will be damaged in the earthquake. The HAZUS model predicts no significant amount of building damage as a result of the earthquake. The HAZUS model predicts no significant amount of estimated economic losses associated with buildings in the HMP planning area and their activities that will occur as a result of the earthquake.

Critical Facility Damage

Essential Facilities The HAZUS model predicts that all essential facilities in the HMP planning area will be functioning at 100% one day after the earthquake.

The HAZUS model estimate of the total number of beds for the hospitals in the HMP planning area, and the number of beds to be available at certain milestone dates after the earthquake. The Scenario 2 Earthquake is expected to have no impact on the number of available beds in the region.

Utility Lifelines There are 5,736 kilometers of potable water pipeline in the HMP planning area. The HAZUS model predicts no significant damage to the potable facilities. There are 3,422 kilometers of waste water pipelines. The model estimates no significant damage to the waste water facilities. The model predicts that there will not be any households without electric power as a result of the earthquake.

The HAZUS model assigns no significant economic cost as a result of damage to the various utility systems in the HMP planning area as a result of the Scenario 2 Earthquake.

Transportation Lifelines The HAZUS model predicts no significant damage to transportation lifelines in the region, and assigns no significant economic cost as a result of damage to transportation lifelines in the region.

High Potential Loss Facilities and Facilities of Local Importance The HAZUS methodology does not allow for the estimation for high potential loss facilities. High potential loss facilities are unique across different locales, and HAZUS does not attempt to predict average characteristics for these facilities as it does with residences or other types of structures.

Debris Generation

The model predicts that the earthquake will not generate a significant amount of debris.

Fires Following the Earthquake

HAZUS estimates that there will not be any fires as a result of this earthquake.

Shelter Requirement HAZUS estimates no displaced households due to the earthquake. No people are expected to seek temporary shelter.

Land Use and Development Trends

The land use and development trends information is excerpted from the *2007 Draft Existing Conditions and Trends Report of the Champaign County Land Resource Management Plan*.

Population & Growth The 2000 U.S. Census Bureau population estimate for Champaign County is 179,669. Since 1972, the area of the County located within the corporate limits of a municipality has increased by 136 percent. Figure 4-1 illustrates the growth of municipal areas in the County occurring between 1972 and 2007. Since 1980, decennial population growth rates in Champaign County have stabilized around 3%. The highest percentages of population growth from 1960 to 2000 occurred in the Village of Savoy and the Village of Mahomet. The highest percentages of population decline occurred in the Villages of Longview, Rantoul, and Foosland.

Countywide population projections indicate, on average, that the County population will total approximately 209,561 people by the year 2030. This represents a countywide population increase of 16.6 percent (29,892 people) for the period of 2000 to 2030.

Existing Land Use Map Figure 4-2 is a countywide existing land use map, based on the Champaign County Assessor database for the year 2007. The County Assessor database contains a land use code for each land parcel which is based on the predominant use of the parcel. For example, lands designated as 'Agriculture' may include farm residences; however, based on the County assessor database, the residential use of these land parcels is incidental (or accessory) to the primary agricultural use of the entire land parcel.

Adopted municipal comprehensive plans within the HMP planning area designate future land use areas extending beyond the urban fringe of a municipality to within the one and one-half mile Extraterritorial Jurisdiction to accommodate expected housing, commercial, industrial land requirements of an increasing population base. Public infrastructure (e.g., public sewer and public water) will be needed to serve these designated future urban growth areas.

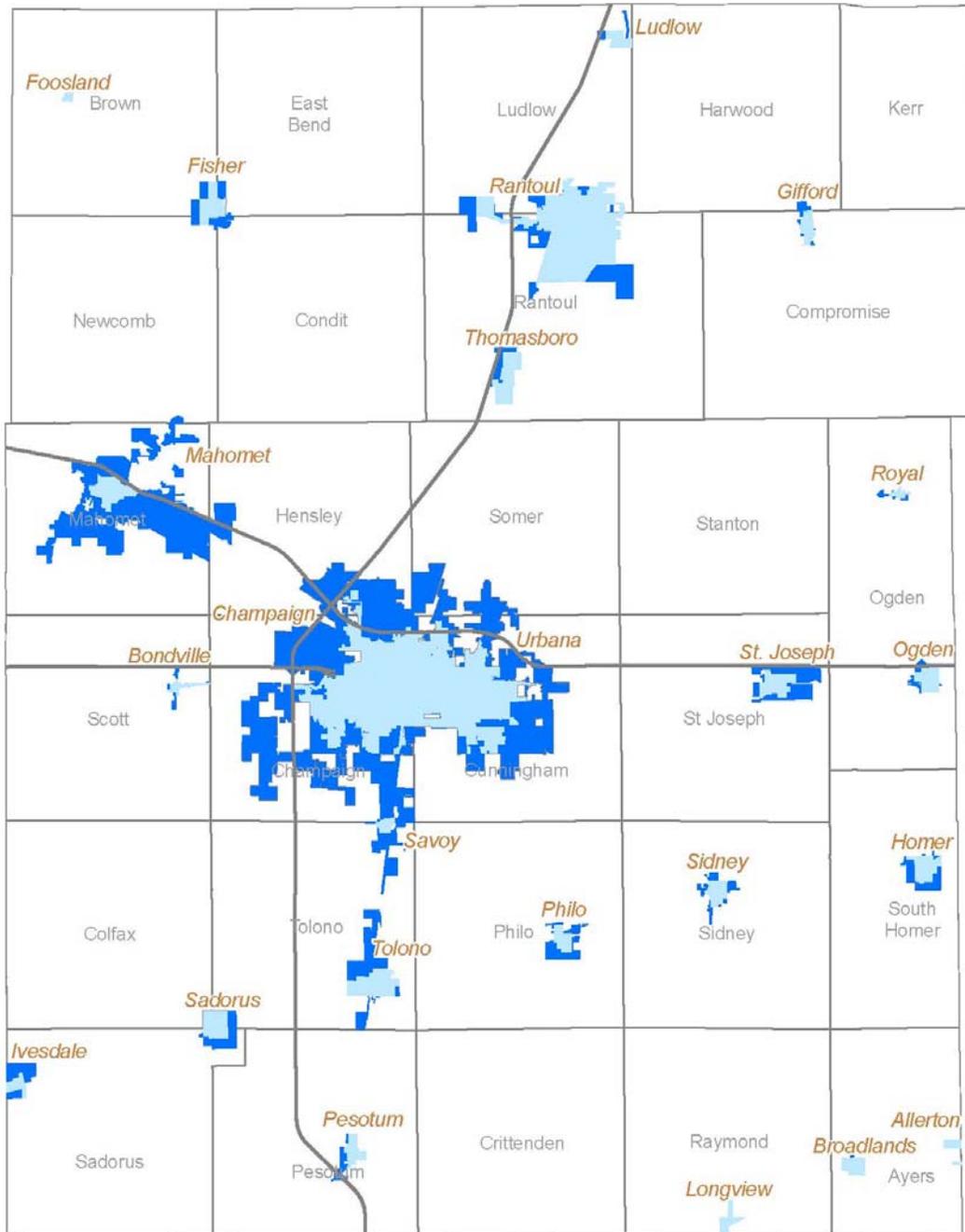
Increased Farmland Conversion Farmlands (cropland) constitute the largest share of land use by acreage in the HMP planning area. The largest percentage of farms continues to be farms that are 100 to 499 acres. The number of farms declined as the average farm size has increased. During 1988-2005 a total of 9,575 acres of farmland were converted, an average of 563 acres per year. The new uses included 4,310 acres of residential land, 283 acres for industrial purposes and 1,150 acres for commercial use. If current trends continue, land conversion is projected to increase in the next 25 years.

Limits on Residential Development in Rural Areas Residential development in unincorporated rural zoning districts is permitted on a limited basis. Since 1999, development of rural residential subdivisions has been regulated by the County's zoning requirement that a Rural Residential Overlay Zoning District be approved. This zoning map amendment process requires a public hearing and includes a detailed review of the residential development proposal as it relates to site suitability and agricultural compatibility.

Commercial and Industrial Development. The vast majority of commercial and industrial development within and near Champaign County occurs within urban areas. That general trend is not expected to change, given the County's policies to limit development within agricultural areas and to preserve agricultural areas. In the rural zoning districts, County zoning regulations allow only for establishment of certain types of low intensity commercial and industrial development that do not require public sanitary

sewer, do not create traffic conflicts, and that are compatible with agricultural operations and other neighboring land uses.

Figure 4-1: Municipal Growth 1972 – 2007



Municipal Growth 1972 to Present

Champaign County

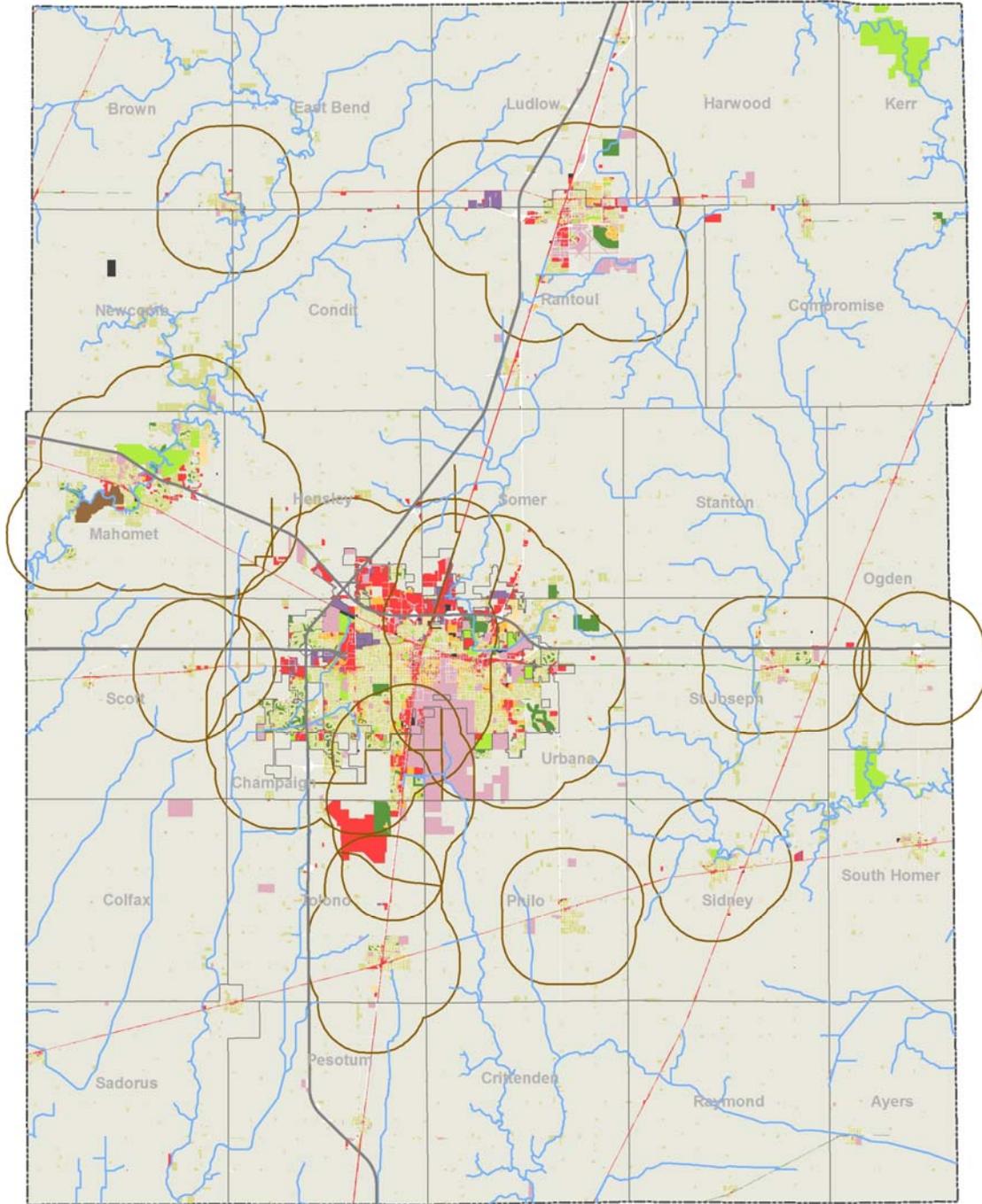
Acres in Municipal Jurisdiction
 1972 - 17806 acres
 2007 - 42149 acres
 136% increase

- Legend**
- Interstates
 - Civil Township
 - 1972 Boundary
 - 2007 Boundary



Date Map Produced:
 October 2007

Figure 4-2: Existing Land Use Map



Existing Generalized Land Use Map

Champaign County

Legend

- | | | |
|---------------------------|---|------------------------|
| Single-Family Residential | Commercial | Public Open Space |
| Multi-Family Residential | Agriculture | Private Open Space |
| Mobile Home Park | Utilities | Public / Institutional |
| Industrial | Township Boundary | |
| Quarry and Mining | Extraterritorial Jurisdiction and Boundary Agreements | |



Date of Preparation:
 October 2007

Overview

This section contains:

- Table 4-21 with a ranking of the profiled natural hazards based on a qualitative assessment of jurisdictions' vulnerability;
- and Table 4-22 that provides a summary of vulnerability to natural hazards by jurisdiction.

Table 4-21: Ranking of Hazards Based on Vulnerability Assessment

Natural Hazard	Hazard Rank	Annual Probability	Property & Crop Damage	Safety Hazard	Critical Facility Vulnerability	Potential Economic Disruption	Jurisdictions Affected
Severe Storm	1	81% <i>47% Tornado</i> <i>62% Hail</i> <i>7% Damaging Lightning</i>	Moderate	High	High	Medium	All
Flood	2	67%	Major	Medium	Medium	Medium	<p>By Riverine Floods:</p> <ul style="list-style-type: none"> ▪ Unincorporated Champaign County ▪ Bondville ▪ Champaign ▪ Fisher ▪ Ivesdale ▪ Mahomet ▪ Rantoul ▪ Royal, ▪ Sadorus ▪ Sidney ▪ St. Joseph ▪ Urbana ▪ Parkland College ▪ UIUC <p>By Ponding and Flash Floods:</p> <p>All</p>
Severe Winter Storm	3	87%	Minor	High	Medium	Medium	All
Extreme Heat	4	-	Minor	High	Low	Low	All
Drought	5	-	Moderate	Low	Low	Medium	All
Earthquake	6	-	Minor	Low	Low	Low	All

Rationale for Ranking of Natural Hazards

- **Severe storms**, which include tornados, hail, and lightning are the highest ranking natural hazard threat of this HMP. The large probability of severe storms, along with the potential threat to not only property, but the health and safety of the jurisdictions’ citizens, make severe storms dangerous. The damage that occurs in a severe storm tends to be more localized than a flooding event, though tornados can damage property and cause injury across a large area.
- **Flooding** is the second ranking threat of this HMP. Although not all jurisdictions are threatened by riverine flooding, the frequency, high potential damage to property, and wide damage area of a flooding event make it a hazard which is likely to cause widespread, significant damage.
- **Severe winter storms** are the third ranking threat of this HMP. Severe winter storms can pose safety risks, particular associated with vehicular travel, because of the reduced visibility, and the slippery road conditions that they cause. Severe winter storms not only have the capability of making travel dangerous, but can disrupt transportation altogether if roads become impassable. Ice storms can cause property damage and interruption of power service.
- **Extreme heat** is the fourth ranking threat of this HMP. Extreme heat is not usually associated with property damage, but poses serious health risks, especially to vulnerable populations. An extreme heat event is likely affect the whole County, putting many people at a health risk.
- **Drought** is the fifth ranked hazard of this HMP. Droughts do threaten crops in the county. However, drought is ranked on the lower end of the hazards because it does not pose a significant threat to structures or critical facilities, nor does it pose a health and safety hazard.
- **Earthquakes** are ranked last in this HMP. The lack of historical damage caused by earthquakes in Champaign County, and the modest damage that is predicted by the HAZUS model suggests that earthquakes are least likely to impact the HMP planning area.

Summary of Vulnerability to Natural Hazards by Jurisdiction Table 4-22 on the following page provides a summary of vulnerability to natural hazards by jurisdiction.

The following key contains a description of categories used to rate overall vulnerability to natural hazards for each jurisdiction:

Key	na	Not a hazard to the jurisdiction
	L	Low Risk - little damage potential (e.g., minor damage to less than 5% of the jurisdiction)
	M	Medium Risk - moderate damage potential (e.g., causing partial damage to 5-10% of the jurisdiction; infrequent occurrence.
	H	Significant Risk - major damage potential (e.g., destructive, damage to more than 10% of the jurisdiction; regular occurrence.)

Table 4-22: Summary of Vulnerability to Natural Hazards by Jurisdiction

Profiled Natural Hazards: ► Jurisdictions: ▼	Severe Storms includes Tornadoes, Hail, Damaging Lightning	Severe Winter Storms	Riverine Floods	Flash Floods or Ponding	Extreme Heat	Drought	Earthquake
Village of Allerton	H	H	na	L	M	L	L
Village of Bondville	H	H	M	L	M	L	L
Village of Broadlands	H	H	na	L	M	L	L
Unincorporated Champaign County	H	H	M	L	M	L	L
City of Champaign	H	H	M	L	M	L	L
Village of Fisher	H	H	M	L	M	L	L
Village of Foosland	H	H	na	L	M	L	L
Village of Gifford	H	H	na	L	M	L	L
Village of Homer	H	H	na	L	M	L	L
Village of Ivesdale	H	H	M	L	M	L	L
Village of Longview	H	H	na	L	M	L	L
Village of Ludlow	H	H	na	L	M	L	L
Village of Mahomet	H	H	M	L	M	L	L
Village of Ogden	H	H	na	L	M	L	L
Village of Pesotum	H	H	na	L	M	L	L
Village of Philo	H	H	na	L	M	L	L
Village of Rantoul	H	H	M	L	M	L	L
Village of Royal	H	H	M	L	M	L	L
Village of Sadorus	H	H	M	L	M	L	L
Village of Savoy	H	H	na	L	M	L	L
Village of Sidney	H	H	M	L	M	L	L
Village of St. Joseph	H	H	M	L	M	L	L
Village of Thomasboro	H	H	na	L	M	L	L
Village of Tolono	H	H	M	L	M	L	L
City of Urbana	H	H	M	L	M	L	L
University of Illinois at Urbana-Champaign	H	H	M	L	M	L	L
Parkland College	H	H	na	L	M	L	L

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Chapter 5 Capability Assessment

Chapter 5 contains the following HMP components:

- State and Local Capability Assessment

This Chapter contains a 'State Capability Assessment' and 'Local Capability Assessment'. Both are intended to provide an overview of existing mitigation authority, programs, plans, regulations, and efforts that relate to mitigation of natural hazards within the HMP planning area.

State Capability Assessment

The Illinois Natural Hazard Mitigation Plan (INHMP) dated October 2007, assesses the State's capability for mitigation of potential harm and damages from natural disasters. An overview of State of Illinois' capability to mitigate impacts of natural hazards is provided in the following INHMP excerpt:

"The State of Illinois has the legal authority to engage in pre- and post-disaster mitigation activities. ...[The Illinois Mitigation Advisory Group] ..develop[s] policy and promote[s] the mitigation policies, best methods and procedures to their respective and related organizations in the State. ...

The State has several funding programs in place which are available to local jurisdictions. These funds are primarily from various Federal grant programs. Currently, the State uses the FEMA programs of HMGP, FMA, PDM and the HUD program of Community Development Block Grants (CDBG) funds to promote mitigation activities. The State supplements these sources with funding from the Flood Hazard Mitigation Program from IDNR/OWR. This program is funded with Capital Bond Funds and the amount varies from year-to-year depending on the appropriation of the legislature. The Program occasionally receives special appropriations from the legislature (e.g., *Build Illinois, Illinois First.*) These funds must be used for the purchase of real property (not mobile homes) in the floodplain.

In Illinois much of the legal enforcement powers are decentralized and lie within the local jurisdictions. Illinois is a 'homerule' State. This results in the lack of uniformity from one jurisdiction to the next. .. Examples are:

- 1) Each jurisdiction must enforce its own zoning rules and regulations which includes floodplain management. The State cannot enforce these regulations, it is up to the local jurisdiction.
- 2) Each jurisdiction chooses whether or not to adopt building codes and is responsible for enforcing building codes. The State of Illinois has not adopted a statewide building code.

... The Illinois DNR/OWR has developed a model ordinance for floodplain management, that provides the minimum requirements an NFIP participating jurisdiction must enforce. This model encourages community development outside of the floodplain and assists in managing the current floodplain. It requires a State permit for any construction in the floodway. Some jurisdictions have chosen to exceed the requirements of the model ordinance and have adopted more restrictive ordinances."

Source: INHMP, 2007

Local Capability Assessment

The local capability assessment contains an overview of existing authorities, policies, ongoing programs and available resources related to the ability of the HMP jurisdictions to mitigate potential losses from natural hazards.

Mitigation Measures in Place

Known existing mitigation measures to avoid the hazardous impacts of severe storms and severe winter storms across the HMP planning area jurisdictions are described in this section.

Weather Warning Systems

A system of outdoor tornado warning sirens serves the highly populated urbanized areas of the HMP planning jurisdiction, including: City of Champaign, City of Urbana, Villages of Rantoul, Mahomet, St. Joseph, and Savoy, the University of Illinois at Urbana-Champaign and Parkland College campuses. Outlying villages with an outdoor tornado warning siren are: Tolono, Philo, Ogden, Ludlow, Sidney, Broadview, Longview, Allerton, Homer, Pesotum, Ivesdale, Fisher, and Fooseland. Unincorporated areas of the County, and the outlying communities of Bondville, Seymour, Gifford, Penfield and Royal are not served by an outdoor tornado warning siren.

Emergency Warning Radios

In the HMP planning area, most large employers, retailers, schools and places of public assembly, and facilities that house vulnerable populations (e.g., hospitals, nursing homes, jails) area have acquired one or more NOAA emergency warning radios to provide warning of severe storms, tornados, dangerous winter storm conditions and other hazards.

Severe Weather Spotters

The Champaign County Emergency Management Agency supports the volunteer efforts of the National Weather Service (NWS) Severe Weather Spotters (aka 'Storm Spotters') throughout the County. NWS utilizes the information provided by Spotters to support its severe weather warning operations, e.g., to verify radar-indicated or public reports of severe weather.

Stormready Designation

Champaign County is a designated Stormready Community and meets the Stormready requirements established by the NWS. Specifically, the County:

- has established a 24-hour emergency operations center;
- has more than one way to receive severe weather warnings and forecasts and to alert the public;
- has created a system that monitors weather conditions locally;
- meets criteria established by NWS regarding promoting the importance of public readiness;
- has developed a formal hazardous weather plan, including training of severe weather spotters and emergency exercises.

Building Code Standards

Certain larger HMP jurisdictions have adopted versions of the *International Residential Code* (for one- and two-family dwellings) and the *International Building Code* (for all other buildings). The *2006 International Code Series* building codes feature fire- and life-safety provisions that address wind and roof construction standards (for snow load). Safe rooms (e.g., tornado shelters) are not addressed in the 2006 International Code series. The *2009 International Building Code* addresses storm shelters and references the new International Code Council's *ICC 500 Standard for Storm Shelters*.

Jurisdictions within the HMP planning area with no adopted building code are subject to requirements of the *Illinois Residential Building Code Act* (815 ILCS 670/1 *et seq.*). This Act requires the identification of a building code as new homes are constructed. Notably, the Act does not obligate the County to enforce the requirements contained within the Act.

Table 5-1 contains information regarding building code adoption by HMP planning area jurisdictions.

Table 5- 1: Building Code Adoption by HMP Planning Area Jurisdictions

Jurisdiction	Building Code Adopted?	Building Code Adopted
Village of Allerton	No	
Village of Bondville	No	
Village of Broadlands	No	
Unincorporated Champaign County	No	
City of Champaign	Yes	2006 International Residential Code and 2006 International Building Code
Village of Fisher	No	
Village of Foosland	No	
Village of Gifford	No	
Village of Homer	No	
Village of Ivesdale	No	
Village of Longview	No	
Village of Ludlow	No	
Village of Mahomet	No	
Village of Ogden	No	
Village of Pesotum	Yes	National Building Code of the Building Officials and Code Administrator (BOCA)
Village of Philo	Yes	
Village of Rantoul	Yes	2006 International Residential Code and 2006 International Building Code
Village of Royal	No	
Village of Sadorus	No	
Village of Savoy	Yes	2003 International Residential Code and 2003 International Building Code
Village of Sidney	Yes	2006 International Residential Code and 2006 International Building Code
Village of St. Joseph	No	
Village of Thomasboro	No	
Village of Tolono	No	
City of Urbana	Yes	2003 International Residential Code and 2003 International Building Code
University of Illinois at U-C*	No	Subject to 2006 International Residential Code and 2006 International Building Code
Parkland College*	No	Subject to 2006 International Residential Code and 2006 International Building Code

Source: Staff Survey of Jurisdictions

Table 5-1 Note* The Illinois Capital Development Board (CDB) is the construction management agency for state construction projects including university and college buildings. CDB has adopted the International Building Codes for use. Building construction at UIUC and Parkland is generally exempt from County or municipal construction permitting requirements.

Manufactured Home Safety

Federal and state programs are in place to regulate construction of and installation (tie-down) of manufactured homes in the State of Illinois.

A manufactured home is subject to separate construction standards established by the U.S. Department of Housing and Urban Development (HUD). Manufactured homes constructed after June 15, 1976 are required to comply with the *National Manufactured Home Construction and Safety Standards*, as established by HUD. Local governmental jurisdictions may regulate the location of manufactured homes or require added on-site inspection procedures; however, the HUD construction standards may not be altered.

At the state level, the Illinois Department of Public Health enforces *The Illinois Mobile Home Act and Manufactured Home Tiedown Code*. These regulations include equipment and installation standards that must be met, including the requirement that installation be completed in accordance with manufacturer specifications. Certification that installation complies with the state Tie-Down Code is required to be filed with the state following installation. At present, the State only conducts post-installation manufactured home inspections following receipt of a complaint. Additional certification requirements apply to manufactured school classroom units.

Important to note is that the federal or state requirements applicable to manufactured homes do not include a requirement for a safe room or a shelter to be provided.

Public Utilities Protection

Ameren IP, a primary supplier of electricity to customers in the HMP planning area, operates a tree-trimming and tree-removal program in urban areas in an effort to ensure that above-ground electric wires are clear of tree limbs and falling tree dangers.

The larger HMP planning area jurisdictions have adopted subdivision code regulations requiring new developments to bury electrical service and other utilities underground in order to lessen vulnerability of utilities (e.g., during a tornado or during an ice storm).

Local Media Outreach

Local television and radio stations provide emergency warning and public service announcements in advance of severe storms and severe winter storm events.

Road Treatment in Advance of Expected Ice Condition

IDOT and the larger jurisdictions maintain fleets of trucks and drivers to spread bulk rock salt (or other anti-icing agents) on major roads in advance of (and during) severe storms expected to produce icing on roads. Generally, arterial roads are completed first, followed by collector roads, sub-collector roads and school zone areas that may not be situated along these more heavily traveled roadways. Additional areas receiving rock salt applications prior to and during winter storm events include roadway curves, hills and local street intersections.

Overview of Local Plans and Selected Regulations

Preventive measures in place by HMP jurisdictions include:

- adoption of a comprehensive land use plan;
- enforcement of floodplain regulations that limit or exclude development in the 100-year floodplain; and
- zoning and subdivision code requirements regarding development in or near the 100-year floodplain.

Table 5-2 indicates which HMP planning area jurisdictions have adopted a comprehensive land use plan, floodplain regulations, subdivision regulations, or zoning regulations.

Table 5-2: Selected Plans and Regulations

Jurisdiction	Comprehensive Land Use Plan	Floodplain Regulations	Stormwater Management Regulations	Zoning Code
Village of Allerton	No	No	No	No
Village of Bondville	Yes	No	Yes, Subdivision Regulations	Yes
Village of Broadlands	No	Yes	No	Yes
Unincorporated Champaign County	Yes ¹	Yes, Special Flood Hazard Areas Ordinance	Yes, Stormwater Management Policy	Yes
City of Champaign	Yes	Yes, Municipal Code Ch. 9	Yes, Subdivision Regulations	Yes
Village of Fisher	Yes	Yes	Yes, Municipal Code	Yes
Village of Foosland	No	No	No	No
Village of Gifford	No	No	Yes, Subdivision Regulations	Yes
Village of Homer	No	No	Yes, Subdivision Regulations	Yes
Village of Ivesdale	No	No	No	Yes
Village of Longview	No	No	No	No
Village of Ludlow	No	No	No	Yes
Village of Mahomet	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Ogden	Yes	No	No	No
Village of Pesotum	No	No	Yes, Subdivision Regulations	Yes
Village of Philo	Yes	No	Yes, Subdivision Regulations	Yes
Village of Rantoul	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Royal	No	No	Yes, Subdivision Regulations	Yes
Village of Sadorus	No	No	Yes, Municipal Code	Yes
Village of Savoy	Yes	No	Yes, Stormwater Control Ordinance	Yes
Village of Sidney	Yes	Yes	Yes, Municipal Code	Yes
Village of St. Joseph	Yes	Yes	Yes, Subdivision Regulations	Yes
Village of Thomasboro	No	No	Yes, Subdivision Regulations	Yes
Village of Tolono	Yes	No	Yes, Subdivision Regulations	Yes
City of Urbana	Yes	City of Urbana HMP, 2005	Yes, Chapter 21, Municipal Code	Yes
University of Illinois at U-C*	No ²	No ³	No ³	No ³
Parkland College*	No ²	No ³	No ³	No ³

Source: Staff Survey of Jurisdictions

Table 5-2 Notes:

1. Champaign County adopted Land Use Goals and Policies in 1977, as its official plan. The Champaign County Land Resource Management Plan (LRMP) is presently under development and review by the County. The LRMP is intended to consolidate and update the County's 1977 Land Use Goals and Policies and the County's 2001 and 2005 Land Use Regulatory Policies.
2. UIUC and Parkland College do not have the legislative authority to produce a comprehensive land use plan. Both, instead, have adopted a campus master plan.
3. The Illinois Capital Development Board (CDB) is the construction management agency for state construction projects including university and college buildings. CDB has adopted the International Building Codes for use. Building construction at UIUC and Parkland is generally exempt from County or municipal construction permitting requirements.

Comprehensive Land Use Plans

Twelve municipalities, as noted in Table 5-3 above, have adopted a comprehensive land use plan. The more recently updated comprehensive land use plans tend to designate stream corridors for open space or recreational use.

Zoning and Subdivision Regulations

The adopted zoning regulations of municipal and county jurisdictions within the HMP planning area typically include minimum setback requirements along streams or rivers.

The adopted subdivision regulations of the municipal and county jurisdictions within the HMP planning area typically address minimum building site and drainageway standards (e.g., that each lot have a building site of sufficient size above the 100-year floodplain; or that roads leading to a development site meet minimum access standards).

Flood Insurance Studies

The Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 led to a number of Flood Insurance Studies completed by FEMA in the 1980's and later updated. The Flood Insurance Studies (FIS) investigated the existence and severity of flood hazards in certain of the HMP planning area jurisdictions, and were used to create the Flood Insurance Rate Maps (FIRM) used in FEMA's National Flood Insurance Program. The following FIS's were completed by FEMA:

- County of Champaign, Illinois (Unincorporated Areas), September 1, 1983
- County of Champaign, Illinois (Unincorporated Areas), revised January 2, 2003
- City of Urbana, Illinois, July 16, 1980
- City of Champaign, Illinois, January 16, 1981
- Village of Mahomet, Illinois, January 2, 2003
- Village of St. Joseph, May 16, 1983
- Village of Fisher, Illinois, February 1, 1984

FIS areas were selected based on the extent and validity of existing relevant data.

The flood sources studied in the County FIS revised in 2003 included portions of Copper Slough, McCullough Creek, Saline Branch, Salt Fork, Sangamon River, Phinney Branch, and Upper Boneyard Creek. "Principal Flood Problems" identified in the Champaign County FIS revised in 2003 are indicated as follows:

- “McCullough Creek, Copper Slough, Upper Boneyard Creek, and Phinney Branch experience overbank flooding due to the short, intense thunderstorms common in central Illinois. No flood event has been measured or high watermarks recorded for these streams.”
- “The Saline Branch experienced a flood of record in 1964 of approximately a 100-year frequency..... Flooding of the Saline Branch usually occurs during spring thaws, when runoff is accelerated by intense rainfalls.”
- “The Sangamon River experienced a flood in April 1994, of approximately a 100-year frequency. However, because there is no longer a recording gauge in Mahomet, there is no accurate estimate of the frequency or magnitude of this event. This storm was used to calibrate the “Sangamon River Floodplain Study.”
- “There is no data or information available pertaining to past flooding on Salt Fork River.”

Boneyard Creek Improvement Plans

The upstream watershed boundary of the Boneyard Creek lies in the northwest portion of the City of Champaign. The Boneyard Creek flows through densely urban portions in the City of Champaign, across the north portion of the University of Illinois campus and the City of Urbana. For years, the Boneyard Creek has functioned as an open stormwater drainage creek. An excerpt from the *City of Urbana 2005 HMP* describes flood problems associated with the Boneyard:

“Ninety percent of the time it contains less than one foot of water. In periods of heavy rainfall, ... it floods low-lying sections. The Boneyard receives the discharge from all storm sewers in the Urbana area and is inadequate for this purpose. Because high waters in the Boneyard greatly reduce the carrying capacity of the trunk and lateral sewers connected to it, flooding is not limited to over-bank floods. There is a general surcharge of much of the drainage system throughout the flatter parts of the two cities. Since the early 1900’s, various efforts have been undertaken to improve the Boneyard ... but these were usually localized remedial measures...”

Since mid-1990’s, the Cities of Champaign and Urbana and the University of Illinois have invested in planning and constructing comprehensive structural improvements to the Boneyard with the overall goal of confining the 100-year floodplain to within the banks of the Boneyard Creek.

By 1999, the City of Champaign installed a massive 38 million gallon detention basin to receive stormwater flow at peak rainfall times. This initial improvement was a major step toward significantly reducing the risk of flooding to the general area and areas downstream in the City of Urbana. The process of flood mitigation of the Boneyard Creek is ongoing and expected to continue for several years. Some of the approved structural improvements planned are:

The *Boneyard Creek Improvement Plan* is a seven-phase plan to provide 100-year flood protection along the Boneyard Creek. This project will mostly benefit and impact residential and business property situated in the Campustown area of the UIUC, and nearby areas in the City of Champaign and City of Urbana. Completed and in progress portions of this Plan include:

- *Boneyard Creek Improvement Plan, Phase 1 (City of Champaign)*
The completed Phase 1 included construction of the Healey Street detention basin and improvements along Boneyard Creek between Lincoln Avenue and First Street, and has provided relief from serious flood problems throughout the Campustown area.
- *Boneyard Creek Improvement Plan, Phase 2 (City of Champaign)*
Phase 2 is presently underway and includes construction of the Second Street detention improvements. Phase 2 will increase the level of flood protection through campus to 100-year protection. Phase 2 improvements will occur between University Avenue and Washington Street in the City of Champaign, and is expected to improve viaduct capacity at Springfield Avenue, Logan Street, Chester Street, and University Avenue.

City of Urbana Boneyard Creek Master Plan, 2008

The Master Plan focuses on the portion of the Boneyard Creek that runs through Downtown Urbana, specifically between Main Street and University Avenue. The plan includes enhancing the physical appearance of the creek through improvements such as naturalization, landscaping, bank stabilization, and other amenities, while maintaining the creek's primary drainage function.

City of Urbana Boneyard Creek Master Plan, 1978

Portions of the 1978 Master Plan remain in effect for the western area of the Boneyard Creek that extends beyond Main Street and University Avenue within the City of Urbana limits.

Watershed Plans

The *John Street Watershed Plan* is being developed to address surface flooding in an urban area within the City of Champaign. The John Street urban watershed extends from Neil Street on the east, Garfield Avenue on the west, Springfield Avenue on the north and Hessel Boulevard on the south. This is a dense residential area that has endured severe surface flooding. The area where surface flooding is most severe includes the 500 and 600 blocks of John Street and the intersection of Daniel Street at Willis Avenue.

Two other watershed management plans have been prepared for rivers situated within the HMP planning area: the *Embarras River Watershed Management Plan* and the *Salt Fork Watershed Plan*.

Boneyard Floodplain Remapping Project

Urbana, Champaign, and the University of Illinois retained the U.S. Geological Survey (USGS) to remap the 100-year floodplain for the Boneyard Creek. The USGS study will be submitted to FEMA to update their flood maps.

The HAZUS 100-year flood data utilized in the HMP Vulnerability Assessment for this HMP is known to be out-of-date in the Boneyard Creek floodplain area, where recent structural improvements have occurred.

Floodplain Map Modernization Project

“Accurate delineation of flood hazard areas is fundamental to floodplain management and mitigation, yet many of Illinois’ regulatory Flood Insurance Rate Maps (FIRMs) are 10 or more years out of date.”

*Excerpt from Floodplain Map Modernization Project Abstract, 2004
Sally McConkey, Principal Investigator*

Since 2004, the IDNR Office of Water Resources (OWR) has been supported by a partnership with FEMA to modernize floodplain mapping for the State of Illinois. This project will produce the best available base maps in a geographic information system (GIS) geodatabase and will result in digital map products that allow for improved updating and maintenance. Updated FIRMs for the HMP planning area are expected to become available by 2010.

Local Media Outreach

Local television and radio stations provide emergency warning and public service announcements to warn motorists of flash flood potential and warn of flooded roadways.

References

2007 Illinois Natural Hazards Mitigation Plan

http://iema.illinois.gov/iema/planning/Documents/Plan_IllMitigationPlan.pdf

Hazards Mitigation Plan, City of Urbana, approved by FEMA May, 2005

http://www.ci.urbana.il.us/Urbana/community_development/planning/comprehensive_plan/hazard_m

Chapter 6 Mitigation Strategy

Chapter 6 contains the following HMP components:

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

Local Hazard Mitigation Goals

Goals are general guidelines that explain what you want to achieve. They are broad policy statements and are usually long-term and represent global visions.

Objectives define strategies or implementation steps to attain the identified goals.

Source: Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning Guide Number Eight, FEMA-386-8

Prior to identifying HMP goals and objectives, Planning Team members reviewed the preceding risk assessment and hazard vulnerability findings for each of the profiled natural hazards. Members reviewed existing local natural hazard mitigation plan goal and objective statements from selected local hazard mitigation plans, including:

- State of Illinois Natural Hazard Mitigation Plan, revised October, 2007
- City of Urbana Hazard Mitigation Plan adopted June 20, 2005
- Champaign County Hazard Mitigation Plan dated July 1997

Planning Team members identified the following broad goal statement as a guideline regarding the HMP long-term intent: “Protect life and properties within the HMP planning area from these natural hazards: severe storms; severe winter storms; floods; extreme heat; drought; and earthquake.” Ultimately, members reached consensus on four goals that broadly describe the long-term ideals and intentions of the HMP. These four goals are:

1. Minimize avoidable deaths and injuries due to natural hazards.
2. Protect existing and new infrastructure from impacts of natural hazards.
3. Include natural hazard mitigation in local government plans and regulations.
4. Coordinate natural hazard mitigation efforts of participating jurisdictions.

Members identified objectives, as possible, to provide specific implementation steps for achieving each goal. These objectives are consistent with those of the current *State of Illinois Natural Hazard Mitigation Plan* and the adopted *City of Urbana Hazard Mitigation Plan*.

The HMP goals and accompanying objectives appear on the following page.

HMP Goals and Objectives

Goal 1. Minimize avoidable injuries and deaths due to natural hazards.

- Objectives*
- 1-a Educate the population regarding methods of protecting self and property from natural hazard impacts.
 - 1-b Establish adequate warning systems.
 - 1-c Protect critical facilities and services from impacts of natural hazards.
 - 1-d Arrange for provision of storm shelters and cooling centers for the population.

Goal 2. Protect existing and new infrastructure from impacts of natural hazards.

- Objectives*
- 2-a Monitor infrastructure conditions for needed maintenance.
 - 2-b Ensure that water is available in the event of a drought.

Goal 3. Include natural hazard mitigation in local government plans and regulations.

- Objectives*
- 3-a Improve the information base regarding vulnerability to impacts of natural hazards.
 - 3-b Review local programs and ordinances to determine how they can better address the impacts of natural hazards.

Goal 4. Coordinate natural hazard mitigation efforts of participating jurisdictions.

- Objective*
- 4-a Update the multiple jurisdiction HMP every five years.

Identification and Analysis of Mitigation Actions

Comprehensive Range of Specific Mitigation Actions For Each Hazard Planning Team members and HMP project staff reviewed a comprehensive range of specific mitigation actions for each hazard and jurisdiction by reviewing groups of mitigation actions as identified by FEMA:

- preventive
- property protection
- natural resource protection
- structural projects
- public education and awareness

continued on next page

Preventive Measures ‘Preventive’ mitigation actions are defined by FEMA as government, administrative, or regulatory actions or processes that influence the way land and buildings are developed and built. These actions include public activities to reduce hazard losses.

Multi-Hazard

1. Adopt the latest International Building Codes.
2. Conduct tree trimming program for street trees so that they do not become safety hazards.

Severe Storms

1. Adopt higher wind resistant building codes.
2. Provide subsidies for wind resistant construction.
3. Provide subsidies for construction of “safe rooms” in existing buildings.
4. Require that all newly constructed buildings have at least one “safe room.”
5. Modify building code to require stronger tie-down and anchoring methods for mobile homes.
6. Require underground utilities for new construction.

Floods

1. Adopt development regulations which limit building in the 100-year flood plain and in areas prone to ponding.
2. Acquire undeveloped land within the flood plain.
3. Acquire development rights within the flood plain.
4. Obtain updated floodplain map.
5. Develop drainage system maintenance standards.
6. Participate in Community Rating System (CRS) for reduced flood insurance premiums through NFIP.

Severe Winter Storms

1. Require underground utilities for new construction.
2. Use tree or vegetation plantings along roadways as a natural barrier to snow drifts.
3. Apply anti-icing or de-icing substance to road surfaces prior to imminent ice storm.

Drought

1. Prepare and implement drought contingency plans to consider actions and needs during drought events, including a plan to ensure that rural residents who rely on shallow wells will have enough water during periods of drought.
2. Map areas with limited water supply and discourage development there.

Extreme Heat

1. Distribute fans.
2. Create a program to repair fans and air conditioners.
3. Encourage voluntary neighbor check programs.

Earthquakes

1. Adopt up-to-date seismic resistant building codes.
2. Incorporate structural and non-structural seismic strengthening actions into on-going capital improvement planning efforts.

Property Protection FEMA defines ‘property protection’ mitigation actions that involve the modification of existing buildings or infrastructure to protect them from a hazard or removal from the hazard area. Examples of property protection mitigation actions considered by HMP participating jurisdictions include:

Property Protection (continued)

Multi-Hazard

1. Structural retrofits
2. Storm shutters
3. Shatter-resistant glass

Floods

1. Acquisition
2. Elevation
3. Relocation

Natural Resource Protection ‘Natural resource protection’ mitigation actions, as defined by FEMA, are those that, in addition to minimizing hazard losses, also preserve or restore the functions of natural systems. The following mitigation actions were considered by HMP participating jurisdictions as ongoing or potential natural resource protection mitigation actions:

Floods

1. Sediment and erosion control
2. Stream corridor restoration
3. Watershed management
4. Forest and vegetation management
5. Wetland restoration and preservation

Emergency Services ‘Emergency services’ mitigation actions, as defined by FEMA, are actions that protect people and property during and immediately after a disaster or hazard event. HMP participating jurisdictions considered the following ongoing or potential emergency service mitigation actions:

Multi-Hazard

1. Install outdoor warning sirens
2. Use NOAA all hazard radios
3. Voluntary text messaging alert systems

Structural Control Projects FEMA defines a mitigation action category of ‘structural control projects’ as actions that involve the construction of structures to reduce the impact of a hazard. HMP participating jurisdictions considered the following as ongoing or potential structural control projects:

Multi-Hazard

1. Install emergency back-up generators in critical facilities

Floods

1. Storm sewer system improvements
2. Improvements to bridges, culverts and roads in floodprone areas

Public Education and Awareness

FEMA defines a category of mitigation actions as ‘public education and awareness’. ‘Public education and awareness’ mitigation actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.

Multi-Hazard

1. Outreach programs
2. Hazard information centers
3. School-age and adult education programs

Floods

1. Disclose real estate flood hazard information

For review purposes, a spreadsheet was developed for each participating jurisdiction to list all known ongoing natural hazard mitigation actions and proposed natural hazard mitigation actions, categorized into the six FEMA categories, noted in the above section. Planning team members and project staff indicated whether each mitigation action listed addressed the effects of natural hazards on: **'new'** buildings and infrastructure, **'existing'** buildings and infrastructure, or **'both'**.

Mitigation Actions that Impact New Buildings and Infrastructure Specific mitigation actions were reviewed for each participating jurisdiction that address the impacts of hazards on new buildings and infrastructure. A review of the ongoing and proposed mitigation actions for each participating jurisdiction was undertaken to consider whether the following types of mitigation actions could be included or proposed:

- Develop and adopt a comprehensive land use plan
- Support or participate in development and implementation of watershed management plan(s)
- Enact subdivision requirement that utilities serving new developments must be underground
- Adopt International Residential Code and International Building Code with most current standards for:
 - wind- and seismic- resistance
 - maximum snow load
 - safe rooms / shelters
- Prohibit or limit development in 100-Year Floodplain
- On jurisdiction website, provide online links to and/or otherwise disseminate available information regarding: natural hazard preparedness and mitigation measures, including effective construction standards
- Encourage individual and business use of NOAA All Hazard Radios

Mitigation Actions that Impact Existing Buildings and Infrastructure Specific mitigation actions that address the impacts of hazards on existing buildings and infrastructure were reviewed for each participating jurisdiction. If applicable and considered as feasible for each participating jurisdiction, the following or other similar mitigation actions were included on each participating jurisdiction's list of ongoing and proposed mitigation actions:

- Participate in National Flood Insurance Program
- Participate in the Community Rating System Program
- Continue regular maintenance of street trees
- Become a Tree City or a Tree Campus
- Become a NWS "Stormready Community"
- Develop a partnership with nonprofit or private agencies to establish or provide shelter or safe room use
- Develop a plan for improvements to protect infrastructure situated within a 100-Year Floodplain (bridges, culverts or roads)
- On jurisdiction websites, provide online links to disseminate available information regarding: natural hazard preparedness and mitigation measures, including effective construction standards
- Encourage individual and business use of NOAA All Hazard Radios

Mitigation Action Preference Survey The Mitigation Measures Preference Survey was designed to gather and consider public input about potential hazard mitigation actions. The *Champaign County HMP Mitigation Measures Survey* was placed online at the HMP website (www.ccrpc.org/HMP) and paper copies of the survey were provided to the primary contact of

each participating jurisdiction. The primary contact for each participating jurisdiction was encouraged to place a link to the survey on their own jurisdiction website and to otherwise publicize the opportunity to complete the survey. The Survey was available online over an eight-week period, November 24, 2008 through January 16, 2009.

The survey contained 40 questions. Participants were asked to indicate whether they “strongly agree,” “agree,” “disagree,” or “strongly disagree” with a series of natural hazard mitigation actions.

Fifty-seven responses to the survey were received. Respondents most preferred implementing public awareness and public education mitigation actions; actions to protect critical facilities; and adopting building codes to require safe rooms and other standards to strengthen structures to be wind resistant.

Identification and Analysis of Mitigation Actions Related to NFIP Compliance

NFIP provides flood insurance to homeowners, renters and businesses in communities which participate in the NFIP. Home and business owners may buy coverage for their buildings and contents, and renters can purchase insurance to cover personal property. NFIP flood insurance is intended for residents and business owners, whether or not they live in a floodplain, as long as their community participates in the program—since approximately 25% of flooding insurance claims occur in areas not readily recognized as being vulnerable to flooding because they are outside mapped flood zones. Based on NFIP data, the average annual flood insurance premium in Illinois is \$450. Some private insurance companies and agents sell and service the policies which are backed by the federal government under FEMA’s NFIP.

Participation in NFIP is based on an agreement between a community and FEMA. The NFIP promotes three flood-related programs:

- **floodplain identification and mapping** NFIP participation requires community adoption of flood maps. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed to administer floodplain management programs and to actuarially rate new construction for flood insurance.
- **floodplain management** To participate in the NFIP, a community is required to adopt and enforce minimum floodplain management regulations that help mitigate the effects of flooding on new and improved structures.
- **flood insurance** Community participation in the NFIP enables property owners to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages.

Source: FEMA Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, p. 61

At present, a total of twelve HMP jurisdictions participate in the National Flood Insurance Program (NFIP). Each of the twelve communities that participate in NFIP agreed to adopt and enforce sound floodplain management practices to reduce future flood damage.

Table 6-1 describes each jurisdiction’s participation in the NFIP.

Table 6-1: Participation in NFIP and Location within Floodplain

<i>Jurisdiction</i>	<i>Does the Jurisdiction participate in NFIP?</i>	<i>Is the jurisdiction located Within 100-Year floodplain?</i>
Unincorporated Champaign County	Yes	partially
Village of Allerton	Yes	No
Village of Broadlands	Yes	No
City of Champaign	Yes	partially
Village of Fisher	Yes	partially
Village of Foosland	Yes	No
Village of Mahomet	Yes	partially
Village of Ogden	Yes	No
Village of Rantoul	Yes	partially
Village of Sidney	Yes	partially
Village of St. Joseph	Yes	partially
City of Urbana	Yes	partially
Village of Bondville	No	partially
Village of Gifford	No	No
Village of Homer	No	No
Village of Ivesdale	No	partially
Village of Longview	No	No
Village of Ludlow	No	No
Village of Pesotum	No	No
Village of Philo	No	No
Village of Royal	No	partially
Village of Sadorus	No	partially
Village of Savoy	No	No
Village of Thomasboro	No	No
Village of Tolono	No	partially
University of Illinois at U-C	n/a	partially
Parkland College	n/a	partially

Figure 6-1 displays the 100-Year Floodplain as mapped by FEMA based on the September 1, 1983 Flood Insurance Study prepared by FEMA for Champaign County. Overlaid is keyed information regarding municipal jurisdictions that presently participate in NFIP. The municipal jurisdictions portrayed in red do not participate. Municipal participations shown in yellow do participate in NFIP.

Jurisdictions Not Participating in NFIP To date, the Villages of Bondville, Gifford, Homer, Ivesdale, Longview, Ludlow, Pesotum, Philo, Royal, Sadorus, Savoy, Thomasboro and Tolono have chosen not to participate in the NFIP. The Villages of Bondville, Ivesdale, Royal, Sadorus, and Tolono are considered as being partially situated within the 100-year floodplain, as inferred from currently available FEMA Flood Insurance Rate Maps (FIRMs). FIRMs have not been mapped to include information about the locations of the 100-year floodplain in the Villages of Gifford, Homer, Longview, Ludlow, Pesotum, Philo, Savoy, and Thomasboro. The locations of municipalities not participating in NFIP are noted in Figure 6-1.

Jurisdictions Participating in NFIP

The identification and analysis of mitigation actions related to continued compliance with the NFIP occurred for each NFIP participating jurisdiction. One or more actions related to NFIP compliance are included in the mitigation action plan for each of these jurisdictions.

Implementation of Mitigation Actions

Mitigation Action Prioritization Method Planning Team members agreed to use a prioritizing method that involves a 3-step analysis of each mitigation action. The analysis is completed by Planning Team members and project staff to prioritize all mitigation actions identified for each participating jurisdiction.

The prioritization method involved allocating points to each mitigation action. Each mitigation action was scored using the 3-step method, with each step yielding up to 14 points each. The maximum total score for any one mitigation action could be 42.

Step 1

The first analysis is one that assesses an 'action scope' for the mitigation action. Up to 14 points were allocated based on which category fits the subject mitigation action. Members determined which level each mitigation action fit into to: Level 1, Level 2, or Level 3. Next, if the mitigation action was determined to be a Level 1 or a Level 2 action, points were assigned based on Planning Team members' expertise and judgment as to the effectiveness of the mitigation action. Because Level 3 actions permanently eliminate or reduce property damages, injuries, or deaths in a specific area, Level 3 actions were assigned the highest amount of 14 points automatically.

A description of the 'action scope' levels and the points to be assigned to each 'action scope' level follows:

Level 1 Actions *Potential Score: 1 to 14 points*

- Eliminate or reduce property damages, injuries and deaths from less significant natural hazards; or
- Educate the public on disaster preparedness and mitigation related to the less significant natural hazards (e.g., drought, or earthquake)

Level 2 Actions *Potential Score: 8 to 14 points*

- Reduce property damages in a specific area; or
- Have the potential to reduce property damages, injuries and deaths across a wide area; or
- Educate the public disaster on preparedness and mitigation

Level 3 Actions *Score: 14 points*

- Permanently eliminate property damages and/or eliminate or reduce injuries and deaths in a specific area; or
- Have a high probability to systematically reduce property damages, injuries and deaths across a wide area.

Step 2

Cost Effectiveness Rating *Potential Score: 1 to 14 points*

Members ranked each mitigation action qualitatively and subjectively, based on perceived cost-effectiveness of the mitigation action. In rating 'cost-effectiveness', a score of 14 points was possible, with lower scores denoting less cost-effectiveness and higher scores denoting greater cost-effectiveness.

Step 3

Feasibility Rating *Potential Score: 1 to 14 points*

Each action was assessed along 14 dimensions using a shortened version of FEMA's STAPLEE framework, referred to here as the 'STAPL Feasibility Chart'. If

the action was generally positive in a certain dimension, it was given a point. The total points available in the 'STAPL Feasibility Chart' ranges from 1 to 14. Figure 6-2 illustrates the STAPL Feasibility Chart that was used for the Step 3 feasibility rating.

Figure 6-2: STAPL Feasibility Chart Used in Step 3 of Prioritization Method

S (Social)		T (Technical)			A (Administrative)			P (Political)			L (Legal)		
Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	Staffing	Funding Allocation	Maintenance/Operations	Political Support	Local Champion	Public Support	State Authority	Existing Local Authority	Potential Legal Challenge

Total Score A total score was assigned to each mitigation action based on the 3-step prioritization process described above.

- Total Score: 0-27 = Priority 3
- 28-35 = Priority 2
- 36-42 = Priority 1

Mitigation actions receiving the highest scores were rated as Priority 1; those receiving mid-range scores were rated as Priority 2; and mitigation actions receiving the lowest range of scores were rated as Priority 3.

Hazard Mitigation Actions Prioritized by Jurisdiction This section contains Table 6-2, which is a list of hazard mitigation actions prioritized by participating jurisdictions. Included in Table 6-2 is information about the party responsible for implementing the mitigation; funding source(s); and a suggested timeframe for implementation. A Key to Table 6-2 is provided below; Table 6-2 begins on the following page.

Table 6-2: Prioritized Mitigation Actions by Jurisdiction

Table 6-2 Key:

Hazards Addressed	
All	All HMP natural hazards
SS	Severe Storms
SWS	Severe Winter Storms
F	Floods
D	Drought
EH	Extreme Heat
E	Earthquakes

Jurisdiction: **Champaign County**

Hazards Addressed	Mitigation Action	Priority
All	1) Educate public and disseminate information regarding all hazards to population through town hall meetings, presentations to groups, and displays Responsible Party: Department of Public Health and Champaign County Emergency Management Agency (EMA) Funding Source(s): federal, state, local or grant Suggested Timeframe: ongoing	1
All	2) Offer and promote the use of an area-wide warning text message system such as Alert Sense. Responsible Party: Champaign County EMA and Champaign Department of Public Health Funding Source(s): local Suggested Timeframe: within six months of FEMA approval of HMP	1
All	3) Encourage use of NOAA all-hazard radios in residences and businesses throughout unincorporated area. Responsible Party: Champaign County EMA Funding Source(s): local or grant Suggested Timeframe: ongoing	2
All	4) Provide information to local public radio and television stations regarding emergency warning and public service announcements. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	2
E	5) Distribute information regarding earthquake hazards and safety procedures to all Champaign County school districts on an annual basis. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	3
F	7) Identify and prioritize needed improvements to County maintained roads that flood in heavy rainstorms, blocking or impairing road use and through access by vehicular traffic Responsible Party: Champaign County Highway Department Funding Source(s): local or grant Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	3
F	8) Research potential funding sources to acquire information regarding boundaries of the floodway and 100-year floodplain throughout unincorporated Champaign County. Responsible Party: Champaign County Environment and Land Use Committee Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	3
SS	9) Establish means of activating an advance warning siren and provide advance warning sirens in outlying unincorporated communities that do not yet have one (e.g., Penfield). Responsible Party: Champaign County EMA Funding Source(s): local or grant Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, E	10) Adopt building regulations that require wind-resistant and earthquake-resistant construction measures for critical facilities that house vulnerable populations or that house volatile liquids or hazardous wastes. Responsible Party: Champaign County Planning & Zoning Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, SWS	11) Coordinate countywide voluntary Storm Spotter program. Responsible Party: Champaign County EMA Funding Source(s): local Suggested Timeframe: ongoing	3
F	12) For lower flood insurance premiums, consider the cost and benefits of County participation in the Community Rating System. Responsible Party: Champaign County Environment and Land Use Committee Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	3

Jurisdiction: **Village of Allerton**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Allerton residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Allerton Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Allerton floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Allerton Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: **Village of Bondville**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Bondville residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Bondville Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village of Bondville participation in National Flood Insurance Program. Responsible Party: Village of Bondville Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: **Village of Broadlands**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Broadlands residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Broadlands floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
F	3) Review hazard mitigation options regarding repetitive flood loss property in Broadlands. Responsible Party: Village of Broadlands Board of Trustees Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3

Jurisdiction: **City of Champaign**

Hazards Addressed	Mitigation Action	Priority
F	1) Continue to implement plans for the East University Avenue area that contain goals and strategies for removing structures within the Boneyard Creek floodway and mitigating flooding hazards with adequate stormwater detention facilities. Responsible Party: City of Champaign Planning Department and Public Works Department Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	1
F	2) Acquire properties located within the Boneyard Creek floodplain as funding allows and as the properties become available. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	3) Review annually City flood hazard regulations for compliance with NFIP regulations. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	4) Conduct volunteer clean-up of Boneyard Creek (part of the MS4 Stormwater Management Program biannual Community Cleanup Day events). Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	5) Require construction projects located within and adjacent to floodplains to be built in accordance with the provisions of the City floodplain regulations. Responsible Party: City of Champaign Public Works Department, Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	6) Require erosion control plans in accordance with City Regulations to mitigate stormwater pollution. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	7) Require construction of detention basins in accordance with City stormwater regulations. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	8) Complete Boneyard Creek Second Street Reach Project. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: completed by 2012	2
F	9) Locate new buildings with regard to recognized floodplains. Responsible Party: City of Champaign Fire Department and Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	10) Adopt Comprehensive Land Use Plan that guides growth and development to suitable locations and includes goals, objectives and policies related to hazard mitigation. Responsible Party: City of Champaign Planning Department Funding Source(s): local Suggested Timeframe: ongoing	2

continued

SS	11) Maintain City's system of advance warning sirens. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	12) Require back up generators for public assembly buildings and buildings that house dependent populations. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, E, F, SWS	13) Require construction projects to conform to wind, snow load, and seismic provisions of the International Building and International Residential Codes. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	14) Install web-portal system that would allow City employees to work from home in the event of an emergency. Responsible Party: City of Champaign Information Technology Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2
All	15) Disseminate public education information through print, internet and television. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS, SWS	16) Prune and remove trees as needed in public right of way areas. Responsible Party: City of Champaign Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS	17) Review International Building Codes for adoption by the city as they are published every three years. Responsible Party: City of Champaign Fire Department Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: **Village of Fisher**

Hazards Addressed	Mitigation Action	Priority
F	1) Encourage all Village of Fisher residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	1
F	2) Adopt or amend Village of Fisher floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 years of FEMA approval of HMP	2
F	3) Review hazard mitigation options regarding repetitive flood loss property in Fisher. Responsible Party: Village of Fisher Board of Trustees Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3

Jurisdiction: Village of Foosland

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Foosland residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Foosland Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Foosland floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Foosland Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Gifford

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Gifford residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Gifford Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Gifford Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Homer

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Homer residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Homer Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Homer Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Ivesdale

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ivesdale residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ivesdale Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Ivesdale Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Longview

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Longview residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Longview Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Longview Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Ludlow

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ludlow residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ludlow Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Ludlow Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Mahomet

Hazards Addressed	Mitigation Action	Priority
F	1) Adopt or amend Village of Mahomet floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Administer Floodplain Management Ordinance and Stormwater Management Ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	1
SS, EH, E	3) Identify designated shelters and cooling centers. Responsible Party: Village of Mahomet Planner and local EMA representative Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	1
SS	4) Maintain advance warning sirens. Responsible Party: Village of Mahomet Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
All	5) Require back up generators for public assembly buildings and buildings that house dependent populations. Responsible Party: Village of Mahomet Planner and Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
F	6) Administer flood elevation standards within Subdivision Ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	2

continued

Hazards Addressed	Mitigation Action	Priority
SS, SWS, E, F, EH	7) Adopt International Building and International Residential Codes Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
D	8) Adopt a water use ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
SS, SWS, E, F, EH	9) Adopt a minimum housing ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2
All	10) Provide emergency patrol and rescue, including access to snowmobiles and 4x4 vehicles. Responsible Party: Village of Mahomet Police and local EMA representative Funding Source(s): local Suggested Timeframe: ongoing	2
All	11) Disseminate public education information through print, internet, and television, including community cable channel. Responsible Party: Village of Mahomet Police Funding Source(s): local Suggested Timeframe: ongoing	2
All	12) Update Comprehensive Land Use Plan to include goals, objectives and policies related to hazard mitigation. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
F	13) Acquire flood-prone properties along Sangamon River for perpetual open space. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SWS	14) Administer a snow emergency ordinance. Responsible Party: Village of Mahomet Planner Funding Source(s): local Suggested Timeframe: ongoing	3
All	15) Educate public via school presentations. Responsible Party: Village of Mahomet Police Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: **Village of Ogden**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Ogden residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Ogden Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Ogden floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Ogden Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Pesotum

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Pesotum residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Pesotum Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Pesotum Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Philo

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Philo residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Philo Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Philo Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Rantoul

Hazards Addressed	Mitigation Action	Priority
All	1) Maintain redundancy in power grid, capability of Village to generate its own power, and backup power generating capabilities for operation of the Village stormwater, waste water, and municipal buildings. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	1
EH	2) Identify cooling shelters for vulnerable populations within the Village. Responsible Party: Village of Rantoul Inspection Department. Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	1
SS	3) Require the construction of storm shelters in existing and new mobile home developments. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	1
All	4) Administer a rental inspection program to inspect all rental properties for structural weaknesses, overcrowding, utilities, and roofing. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	1
F	5) Adopt or amend Village of Rantoul floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1

continued

Hazards Addressed	Mitigation Action	Priority
SS, SWS, E, EH	6) Require construction projects to conform to surge protection, energy efficiency, wind, snow load, and seismic provisions of the International Building and International Residential Codes. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS	7) Maintain advance warning sirens. Responsible Party: Village of Rantoul ESDA, Police and Public Works Departments Funding Source(s): local Suggested Timeframe: ongoing	1
All	8) Maintain fiber optic connections to Village wastewater, stormwater, electric and municipal facilities to allow their remote operation in the event they become inaccessible. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	9) Conduct tree trimming and removal program in public right of way areas to prevent damage to overhead electric lines. Responsible Party: Village of Rantoul Public Works Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	10) Require new developments to bury electrical utilities underground. Responsible Party: Village of Rantoul Power Department and Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, E, F	11) Ensure that anchoring requirements are in place for mobile homes. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS	12) Notify ESDA director, monitor Doppler radar, and send lookouts to monitor tornados when a Tornado Warning is issued. Responsible Party: Village of Rantoul Police Department and ESDA Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	13) Disseminate public education information through print, internet, and television, including community cable channel. Responsible Party: Village of Rantoul Board of Trustees Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
E	14) Conduct rapid visual screening to identify structural and non-structural hazards. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 2 to 4 years of FEMA approval of HMP	2
SS	15) Install surge protection in existing critical facilities. Responsible Party: Village of Rantoul Public Works and Inspection Department Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
All	16) Review International Building Codes for adoption by the Village as they are published every three years. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	2

continued

Hazards Addressed	Mitigation Action	Priority
All	17) Update Comprehensive Land Use Plan to include goals, objectives, and policies related to hazard mitigation. Responsible Party: Village of Rantoul Inspection Department Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
F	18) Require construction of detention basins pursuant to Village stormwater detention requirements. Responsible Party: Village of Rantoul Public Works and Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS, F	19) Conduct quarterly meetings of storm drainage committee to identify, prioritize and oversee drainage improvements. Responsible Party: Village Inspection Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS	20) Use PA systems in police and fire vehicles to warn citizens in the event that the advance warning sirens fail. Responsible Party: Village of Rantoul Police Department Funding Source(s): local Suggested Timeframe: ongoing	3

Jurisdiction: **Village of Royal**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Royal residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Royal Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Royal Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: **Village of Sadorus**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Sadorus residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Sadorus Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Sadorus Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: **Village of Savoy**

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Savoy residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Board of Trustees Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
SS, SWS, EH	3) Identify and maintain storm shelters and cooling centers within the Village. Responsible Party: Village of Savoy Public Works Department and Village Emergency Services Disaster Agency Funding Source(s): local Suggested Timeframe: ongoing	2
F	4) Require construction of detention basins pursuant to stormwater detention requirements in Village subdivision standards. Responsible Party: Village of Savoy Zoning Administrator Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS, F	5) Complete improvements to Village of Savoy storm sewer system to alleviate flooding due to heavy rainfall in old Village of Savoy area. Responsible Party: Village of Savoy Department of Public Works Funding Source(s): local Suggested Timeframe: within 2 to 4 years of FEMA approval of HMP	2
All	6) Adopt a minimum Building Code ordinance. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	2
SS, SES, F, E	7) Provide emergency patrol and rescue, including access to rescue and 4x4 vehicles. Responsible Party: Village of Savoy Fire Department and Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
All	8) Update the Village of Savoy Comprehensive Land Use Plan to reflect future hazard mitigation actions. Responsible Party: Village of Savoy Board of Trustees Funding Source(s): local Suggested Timeframe: within 2 to 5 years of FEMA approval of HMP	3

Jurisdiction: **Village of Sidney**

Hazards Addressed	Mitigation Action	Priority
F	1) Encourage all Village of Sidney residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Adopt or amend Village of Sidney floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

continued

F	3) Review feasibility of protecting critical facility in Village from flood damage. Responsible Party: Village of Sidney Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	3
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Jurisdiction: Village of St. Joseph

Hazards Addressed	Mitigation Action	Priority
F	1) Complete Phase II Improvements to Village stormwater collection system. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: ongoing	1
All	2) Encourage all Village of St. Joseph residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	3) Adopt or amend Village of St. Joseph floodplain management regulations to comply with NFIP requirements. Responsible Party: Village of St. Joseph Board of Trustees Funding Source(s): local Suggested Timeframe: within two years of FEMA approval of HMP	2

Jurisdiction: Village of Thomasboro

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Thomasboro residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Thomasboro Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Thomasboro Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: Village of Tolono

Hazards Addressed	Mitigation Action	Priority
All	1) Encourage all Village of Tolono residents and businesses to purchase and use a NOAA all-hazard radio. Responsible Party: Village of Tolono Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
F	2) Review cost and benefits of Village participation in National Flood Insurance Program. Responsible Party: Village of Tolono Board of Trustees Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

Jurisdiction: **City of Urbana**

Hazards Addressed	Mitigation Action	Priority
All	1) Complete installation of emergency back up power systems for remaining essential City facilities such as Fire Stations 2 and 3 and the Civic Center. Responsible Party: City of Urbana Public Works and Fire Departments Funding Source(s): federal and local Suggested Timeframe: within two years of FEMA approval of HMP, or as funding permits	1
All	2) Participate in countywide integrated information base for multi-hazard applications. Responsible Party: Champaign County Regional Planning Commission GIS Consortium and City of Urbana Funding Source(s): local Suggested Timeframe: ongoing	1
All	3) Identify existing buildings as shelters. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
All	4) Offer and promote the use of area-wide warning text message system (e.g., Alert Sense.) Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS	5) Maintain an advance outdoor warning siren system Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	6) Use Risk Watch program in schools. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	7) Educate the public--especially seniors and the disabled--on methods to ensure critical documents can be easily retrieved in case of emergency. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: ongoing	1
E	8) Periodically review and update International Building Code requirements concerning seismic resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
SS, SWS	9) Periodically review and update International Building Code requirements concerning high wind resistance. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	1
F	10) Provide back up maintenance of storm water detention basins by amending Subdivision Ordinance to require developers to pre-approve a tax benefit district to include properties served by a detention basin in the event that a property owner association fails to maintain it. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1

continued

Hazards Addressed	Mitigation Action	Priority
F	11) Amend the City of Urbana floodplain management regulations to require a minimum of one-foot freeboard above the 100-year floodplain for new construction. Responsible Party: City of Urbana Community Development Services and Public Works Departments Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	12) Encourage distribution of NOAA all-hazard radios to special needs populations. Responsible Party: City of Urbana Fire Department Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2
F	13) Update FEMA Flood Insurance Rate Maps based on a study of the floodway and 100-year floodplain of the Boneyard Creek. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: within 18 months of FEMA approval of HMP	2
F	14) Offer zoning transfer of development rights as a tool within the Boneyard Creek District. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: ongoing	2
All	15) Monitor and target financial assistance to improve safety of existing buildings in TIF districts. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: ongoing	2
SS	16) Educate local builders on wind resistant construction techniques. Responsible Party: City of Urbana Building Safety Division Funding Source(s): local Suggested Timeframe: ongoing	2
SS, SWS	17) Trim and tree removal program to reduce limb and tree hazards. Responsible Party: City of Urbana Public Works Department Funding Sources: local Suggested Timeframe: ongoing	2
SS, SWS	18) Improve maintenance and proper species selection in urban forestry. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	2
F	19) When appropriate, acquire flood-prone properties along the Boneyard Creek to expand greenways. Responsible Party: City of Urbana Public Works Department Funding Source(s): local Suggested Timeframe: ongoing	3
SS, SWS, E	20) Provide technical support and funding or subsidies to upgrade critical facilities. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS, SWS, E	21) Provide technical support and funding or subsidies to upgrade unreinforced masonry buildings in downtown Urbana. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP	3
SS	22) Educate residents of mobile home parks regarding the location of safe shelters and/or offer shelters within parks. Responsible Party: City of Urbana Community Development Services Department Funding Source(s): federal, state, and local Suggested Timeframe: within 3 to 5 years of FEMA approval of HMP, or as funding permits.	3

Jurisdiction: **University of Illinois at Urbana-Champaign**

Hazards Addressed	Mitigation Action	Priority
All	1) Construct a new Office of Campus Emergency Planning Website Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	2) Incorporate nine emergency notification systems used to alert the campus community Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	3) Assign Building Emergency Coordinators to assist in creation of Building Emergency Action Plans for natural, man-made, and technological disasters. Responsible Party: Office of Campus Emergency Planning Funding Source(s): staff time Suggested Timeframe: within one year of FEMA approval of HMP	1
All	4) Develop and implement the Building Emergency Plan template to be used by campus buildings. Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	1
All	5) Develop and implement the UC-Berkeley Continuity of Operations Plan template. Responsible Party: Office of Campus Emergency Planning Funding Source(s): state and local Suggested Timeframe: within 2 to 3 years of FEMA approval of HMP	1

Jurisdiction: **Parkland College**

Hazards Addressed	Mitigation Action	Priority
All	1) Offer and promote the use of an area-wide warning text message system such as Alert Sense. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local and state Suggested Timeframe: within six months of FEMA approval of HMP	1
SS	2) Identify existing buildings as shelters. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	1
All	3) Improve Parkland College public safety website. Responsible Party: Parkland College Department of Public Safety Funding Source(s): local Suggested Timeframe: within one year of FEMA approval of HMP	2

References

Multi-Hazard Identification and Risk Assessment. Federal Emergency Management Agency, 1997. Washington, DC: FEMA.

Multi-Jurisdictional Mitigation Planning: State and Local Mitigation Planning How-To Guide Number Eight, FEMA-386-8, Federal Emergency Management Agency, 2006. Washington, DC: FEMA.

Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, Federal Emergency Management Agency, 2008. Washington, DC: FEMA.

Chapter 7 Plan Maintenance

Chapter 7 includes the following HMP components:

- Description of method and schedule for monitoring, evaluating, and updating the mitigation plan within a five-year cycle. *FEMA Requirement § 201.6(c)(4)(i)*
- Description of how the HMP will be incorporated into local planning mechanisms for each jurisdiction. *FEMA Requirement §201.6(c)(4)(ii)*
- Description of how public involvement will be continued in the HMP maintenance process. *FEMA Requirement § 201.6(c)(4)(i)*

Monitoring, Evaluating, and Updating the Plan

The FEMA *Local Multi-Hazard Mitigation Planning Guidance* indicates the following:

“A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in its priorities, and resubmit it for approval within five years in order to continue to be eligible for mitigation project grant funding.”

The Planning Team recommends that, because the HMP is a multi-jurisdictional effort, it should be reviewed on an annual basis, beginning one year after FEMA acceptance. Annual reviews will facilitate improved tracking and record-keeping of progress toward implementation, and allow for an easier, more efficient five-year update. The Planning Team recommends that:

- The HMP Planning Team, as identified in Chapter One, should be retained as the ongoing organization to maintain the HMP, with Planning Team vacancies filled on an as-needed basis.
- Continue to use the ‘combination’ approach to represent all participating jurisdictions for the annual HMP review and the five-year update. The combination approach allows for direct representation of the seven largest populated jurisdictions and the two higher education institutions on the Planning Team, and for the authorized representation of the 19 smaller municipalities on the Planning Team, with the Planner for Champaign County facilitating the authorized representation of the 19 smaller municipalities on the Planning Team.
- To facilitate the annual HMP review, an easy-to-use survey form should be used to canvass Planning Team members and key municipal representatives of participating jurisdictions regarding changing circumstances, and progress toward implementing mitigation actions for each participating jurisdiction. The survey form could be used by representatives of each participating jurisdiction to report on any changing circumstances that impact the priority of selected mitigation actions for each jurisdiction, or the proposed addition of a mitigation action by a participating jurisdiction.
- The Planner for Champaign County should continue to coordinate the annual review of the HMP and the HMP update on a five-year cycle.
- The Planning Team should meet at least once a year to review the progress of participating jurisdictions toward implementing the HMP mitigation actions. The annual meeting should include an opportunity for Planning Team members to brainstorm and discuss ways to improve the coordination of participating jurisdictions’ efforts toward implementing HMP mitigation actions.

- The outcome of the HMP annual review should be a brief that: 1) reports significant changing circumstances within the HMP planning area related to natural hazard risk assessment; and 2) includes an update regarding efforts by jurisdictions toward implementing selected mitigation actions over the preceding year, and new mitigation action proposals.
- The five-year HMP update cycle will begin at the time of FEMA acceptance of the HMP. In order that participating jurisdictions can remain eligible for mitigation project grant funding opportunities, the schedule to complete the five-year update should commence 18 months prior to the end of the five-year cycle. This schedule would allow sufficient time for representatives of each participating jurisdiction to review and adopt an update to the HMP, and to allow for FEMA approval of changes to the HMP proposed as part of the five-year update.

Incorporation into Existing Planning Mechanisms

Changes proposed to the HMP as a result of the five-year update to the HMP will be subject to the standard review processes of each participating jurisdiction, as follows:

Table 7-1: Standard Review Process for 5-Year Update

<i>Participating Jurisdiction</i>	<i>At the beginning of the 18-month HMP update:</i>	<i>Once the HMP update is approved by FEMA:</i>
Parkland College University of Illinois at Urbana-Champaign	...these participating jurisdictions will be directly represented on the Planning Team.	...if a college or university has fully participated in the development and review of the HMP in accordance with 44 CFR § 201.6, it is not necessary for them to approve or adopt the plan as long as it is approved by IEMA.
Champaign County City of Champaign City of Urbana Village of Rantoul Village of Mahomet Village of Savoy Village of St. Joseph	...these participating jurisdictions will be directly represented on the Planning Team.	
Village of Allerton Village of Bondville Village of Broadlands Village of Fisher Village of Foosland Village of Gifford Village of Homer Village of Ivesdale Village of Longview Village of Ludlow Village of Ogden Village of Pesotum Village of Philo Village of Royal Village of Sadorus Village of Sidney Village of Thomasboro Village of Tolono	...these participating jurisdictions will need to re-affirm that the Planner for Champaign County is authorized to represent the jurisdiction on the HMP Planning Team.	...the County Board, City Council, or Village Board of each of these participating jurisdictions will need to adopt the HMP update, in order to remain eligible for FEMA mitigation funding.

The HMP Goal 3 calls for including natural hazard mitigation in local government plans and regulations. HMP Objective 3-b specifically calls for the review of local programs and ordinances to determine how they can better address the impacts of natural hazards.

As the HMP is reviewed annually, and updated every five years, the Planning Team will continue to identify opportunities for incorporating the HMP into local planning mechanisms on behalf of each participating jurisdiction. The planning mechanisms for participating jurisdictions will vary and may include plans, codes, ordinances, regulations, guidelines, and programs.

Continued Public Involvement

Ongoing opportunities for citizen input will remain an essential component of the HMP maintenance process. Efforts to inform the public and to allow for their effective participation as the HMP is reviewed and updated are described as follows:

Interactive HMP Website. The HMP website (<http://www.ccrpc.org/HMP>) established by the Champaign County Regional Planning Commission will be maintained, providing a means to both share information with the public about development of the Champaign County HMP and to allow public feedback regarding the HMP. The website will continue to include agendas and minutes of the annual Planning Team meeting, and meetings related to the five-year HMP update, plus related documents and links.

Public Notice of Planning Team Meetings. A public notice of each HMP Planning Team Meetings will be published beforehand in The News-Gazette, the newspaper in the County with the largest overall circulation.

Public Service Announcements and Press Releases. PSA's and press releases that include information about opportunities for public participation in the HMP review and five-year updates will be issued.

Public Meeting. Prior to the end of the five-year HMP update cycle, a public meeting will be held before the Champaign County Environment and Land Use Committee. Comments and questions from the public will be accepted at that meeting.

References

Developing the Mitigation Plan: Identifying Mitigation Actions and Implementation Strategies, FEMA 386-3, Federal Emergency Management Agency, 2003. Washington, DC: FEMA.

Bringing the Plan to Life: Implementing the Hazard Mitigation Plan, FEMA 386-4, Federal Emergency Management Agency, 2003. Washington, DC: FEMA.

Local Multi-Hazard Mitigation Planning Guidance, July 1, 2008, Federal Emergency Management Agency, 2008. Washington, DC: FEMA.

Planning and Urban Design Standards, 1st Edition, American Planning Association, John Wiley & Sons, 2006

(name of jurisdiction) _____

(governing body) _____

(address) _____

Adoption Resolution (Draft)

WHEREAS, *(insert name of jurisdiction)*, with the assistance from the Champaign County Regional Planning Commission, has gathered information and prepared the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan; and,

WHEREAS, the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan has been prepared in accordance with FEMA requirements at 44 C.F.R. 201.6; and

WHEREAS, *(insert the name of jurisdiction)* is a local unit of government that has afforded the citizens an opportunity to comment and provide input in the Plan and the action in the Plan; and

WHEREAS, *(insert the name of the governing body)* has reviewed the Plan and affirms that the Plan will be updated no less than every five years;

NOW, THEREFORE, BE IT RESOLVED by *(insert the name of the governing body)* that *(insert the name of jurisdiction)* adopts the Champaign County Multi-Jurisdictional Natural Hazard Mitigation Plan as this jurisdiction's Multi-Hazard Mitigation Plan, and resolves to execute the actions in the Plan.

ADOPTED this _____ day of _____, 20___ at the meeting of the *(insert the name of the governing body)*.

Insert appropriate signature lines and dates

(Mayor, Village Clerk, County Board Chair, etc...)

Resolutions for Authorized Representation

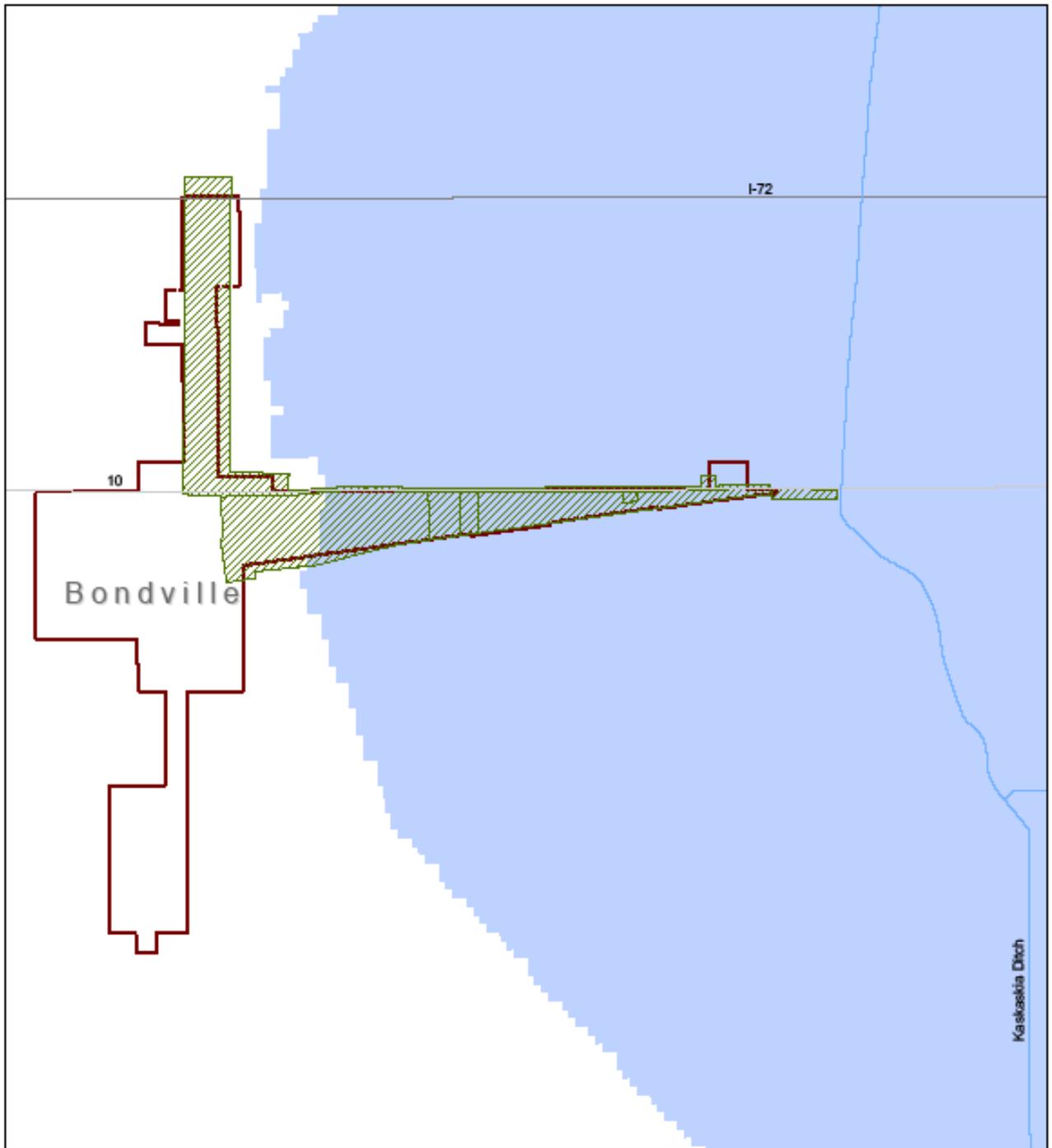
Each participating jurisdiction not directly represented on the Planning Team provided a signed resolution to appoint the Champaign County Regional Planning Commission to act as the authorized representative in the development of the Champaign County Multi-Jurisdictional Hazard Mitigation Plan. Appendix 2 contains a copy of the signed authorizing resolution for each of the following participating jurisdictions:

1)	Village of Allerton	Resolution Authorizing Village of Allerton to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated May 20, 2008
2)	Village of Bondville	Resolution No. 08-04-01 Authorizing Village of Bondville to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 6, 2008
3)	Village of Broadlands	Resolution Authorizing Village of Broadlands to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 6, 2008
4)	Village of Fisher	Resolution Authorizing Village of Fisher to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 14, 2008
5)	Village of Foosland	Resolution Authorizing Village of Foosland to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated January 14, 2008
6)	Village of Gifford	Resolution Authorizing Village of Gifford to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 7, 2008
7)	Village of Homer	Resolution Authorizing Village of Homer to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 11, 2008
8)	Village of Ivesdale	Resolution Authorizing the Village of Ivesdale to Participate in the Development of a Multi Jurisdictional Mitigation Plan dated February 18, 2008
9)	Village of Longview	Resolution Authorizing Village of Longview to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 20, 2008
10)	Village of Ludlow	Resolution 08-1: Resolution Authorizing Village of Ludlow to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
11)	Village of Ogden	Resolution Authorizing Village of Ogden to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 7, 2008
12)	Village of Pesotum	Resolution Authorizing Village of Pesotum to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated March 5, 2008
13)	Village of Philo	Resolution No. 2008–1: Resolution Authorizing Village of Philo to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 13, 2008
14)	Village of Royal	Resolution Authorizing Village of Royal to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 11, 2008
15)	Village of Sadorus	Resolution Authorizing Village of Sadorus to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated May, 2008
16)	Village of Sidney	Resolution Authorizing Village of Sidney to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
17)	Village of St. Joseph	Resolution No. 2008–2: Resolution Authorizing Village of St. Joseph to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 12, 2008
18)	Village of Thomasboro	Resolution Authorizing Village of Thomasboro to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February 4, 2008
19)	Village of Tolono	Resolution Authorizing Village of Tolono to Participate in the Development of a Multi-Jurisdictional Mitigation Plan dated February May 20, 2008

Jurisdiction Specific Vulnerability Assessments

Flood hazards from a 100 year flood event do not threaten all of the jurisdictions in the HMP planning area. The HAZUS model predicts that the following jurisdictions will sustain damage in such an event: Village of Bondville; unincorporated Champaign County; City of Champaign; Village of Fisher; Village of Ivesdale; Village of Mahomet; Village of Rantoul; Village of Royal; Village of Sadorus; Village of Sidney; Village of St. Joseph; City of Urbana; Parkland College; and the University of Illinois at Urbana-Champaign.

Preceding the description of the estimated 100-year flood damage to each of the above-noted jurisdictions, a map is shown to indicate municipal boundaries and the census blocks which contain areas within the 100 year flood plain. The HAZUS model was used to analyze and calculate estimated damage to these blocks. The census blocks do not in all cases align exactly with the municipal boundaries of the jurisdiction.



Bondville Boundary Definition

Legend

-  Census Blocks in Flood Plain
-  Municipal Boundary

-  100 year flood plain
-  Non Intermittent Stream

-  Interstates
-  Federal hwy
-  State Hwy



0 0.125 0.25 Miles

Date of Preparation:
 August 2008

Village of Bondville

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-1: Expected Bondville Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	1	1
Religion	0	0	0	0	0	0	0
Residential	0	0	3	5	15	19	42
TOTAL	0	0	3	5	15	20	43

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-2: Expected Bondville Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	7	7
Masonry	0	0	0	1	4	3	8
Steel	0	0	0	0	0	0	0
Wood	0	0	3	4	11	10	28
TOTAL	0	0	3	5	15	20	43

* Substantially damaged means greater than 50% of the building has been damaged

The following table displays the building related economic loss estimates in Bondville resulting from the 100 year flood event.

Table A3-3: Bondville Building Related Economic Loss Estimates
 (Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	3,338	31	497	240	4,106
	Content	1,769	112	618	434	2,933
	Inventory	0	9	120	85	214
	Subtotal	5,107	152	1,235	759	7,253
Business Interruption						
	Income	0	0	0	3	3
	Relocation	7	0	0	0	7
	Rental Income	1	0	0	0	1
	Wage	0	0	0	7	7
	Subtotal	8	0	0	10	18
ALL	Total	5,115	152	1,235	769	7,271

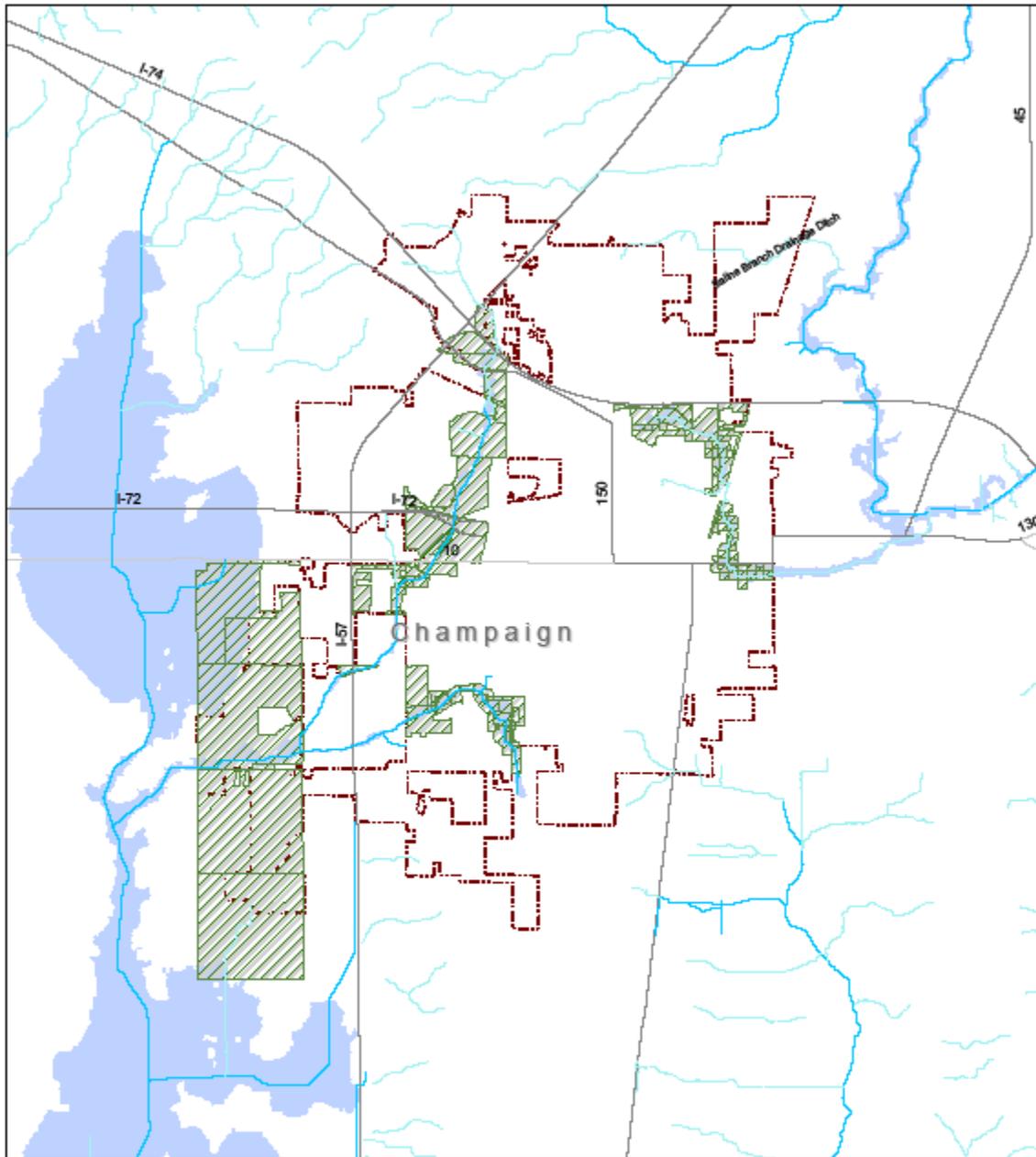
Critical Facility Damage in Bondville

The HAZUS model does not predict that any of the critical facilities in the Village of Bondville will sustain damage.

Debris Generation in Bondville

The model predicts that a total of 1,108 tons of debris will be generated as a result of the flood. Of this debris, 493 tons will be finishing materials, 330 tons will be structural materials, and 285 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 45 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Bondville HAZUS estimates that 143 people will be displaced as a result of flood damage. Also estimated is that, of this group, 112 people will seek temporary shelter in public shelters.



Champaign Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood plain |  100 year flood plain |  State Hwy |
|  Municipal Boundary |  Non Intermittent Stream |  Interstates |
| |  Intermittent stream |  Federal hwy |



Date of Preparation:
 August 2008

City of Champaign

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-4: Expected Champaign Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Greater than 50%	
Agriculture	0	0	0	0	0	0	0
Commercial	0	3	0	0	2	0	5
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	2	9	30	54	111	206
TOTAL	0	5	9	30	56	111	211

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-5: Expected Champaign Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Greater than 50%	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	14	14
Masonry	0	1	0	2	9	14	26
Steel	0	1	0	0	0	0	1
Wood	0	2	9	28	46	83	168
TOTAL	0	4	9	30	55	111	209

The following table displays the building related economic loss estimates in Champaign resulting from the 100 year flood event.

Table A3-6: Champaign Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	57,072	14,639	1,136	4,901	77,748
	Content	33,275	31,049	2,090	20,555	86,969
	Inventory	0	500	226	37	763
	Subtotal	90,347	46,188	3,452	25,493	165,480
Business Interruption						
	Income	6	224	0	24	254
	Relocation	75	49	0	1	125
	Rental Income	49	32	0	0	0
	Wage	13	238	0	783	1,034
	Subtotal	143	543	0	808	1,413
ALL	Total	90,490	46,731	3,452	26,301	166,893

Critical Facility Damage in Champaign

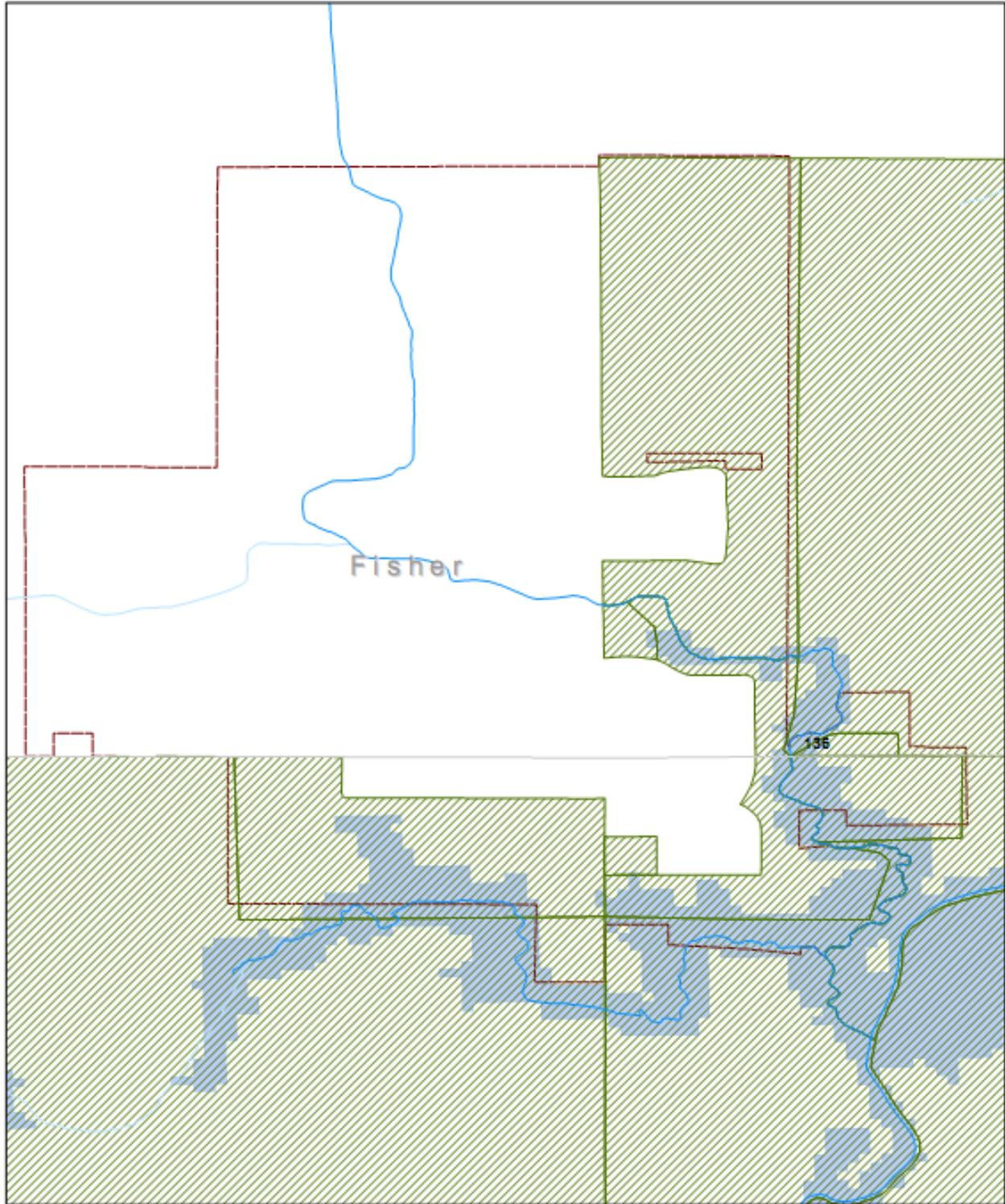
HAZUS predicts that only one critical facility in Champaign will be damaged in a 100 year flood event. This facility is a nursing home which is categorized as a ‘Facility of Local Importance’. HAZUS predicts that the building will be 38% damaged. Damage to the building is estimated at \$5,980,000. The model predicts that 70% of the contents of the building will be lost. The value of these lost contents is estimated to be \$16,290,000. It is estimated that it will take 720 days for the nursing home to regain 100% of its pre-event functionality.

Debris Generation in Champaign

The model predicts that a total of 26,970 tons of debris will be generated as a result of the flood. Of this debris: 8,509 tons will be finishing materials; 11,017 tons will be structural materials; and 7,444 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1,079 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Champaign

HAZUS estimates that 3,137 people will be displaced as a result of flood damage. Also estimated is that, of this group, 2,656 people will seek temporary shelter in public shelters.



Fisher
Boundary Definition

Legend

- | | | |
|--|--|--|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Streams |  StateHwys |
| |  Intermittent Streams |  FedHwys |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN



0 0.09 0.18 Miles

Date of Preparation:
 August 2008

Village of Fisher

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-7: Expected Fisher Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	14	19
TOTAL	0	0	0	1	4	14	19

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-8: Expected Fisher Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	4	4
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	10	15
TOTAL	0	0	0	1	4	14	19

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Fisher resulting from the 100 year flood event.

Table A3-9: Fisher Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	2,746	51	30	49	2,876
	Content	1,334	117	34	54	1,539
	Inventory	0	0	7	10	17
	Subtotal	4,080	168	71	113	4,432
Business Interruption						
	Income	0	0	0	0	0
	Relocation	5	0	0	0	5
	Rental Income	1	0	0	0	1
	Wage	0	2	0	1	3
	Subtotal	6	2	0	1	9
ALL	Total	4,086	170	71	114	4,441

Critical Facility Damage in Fisher

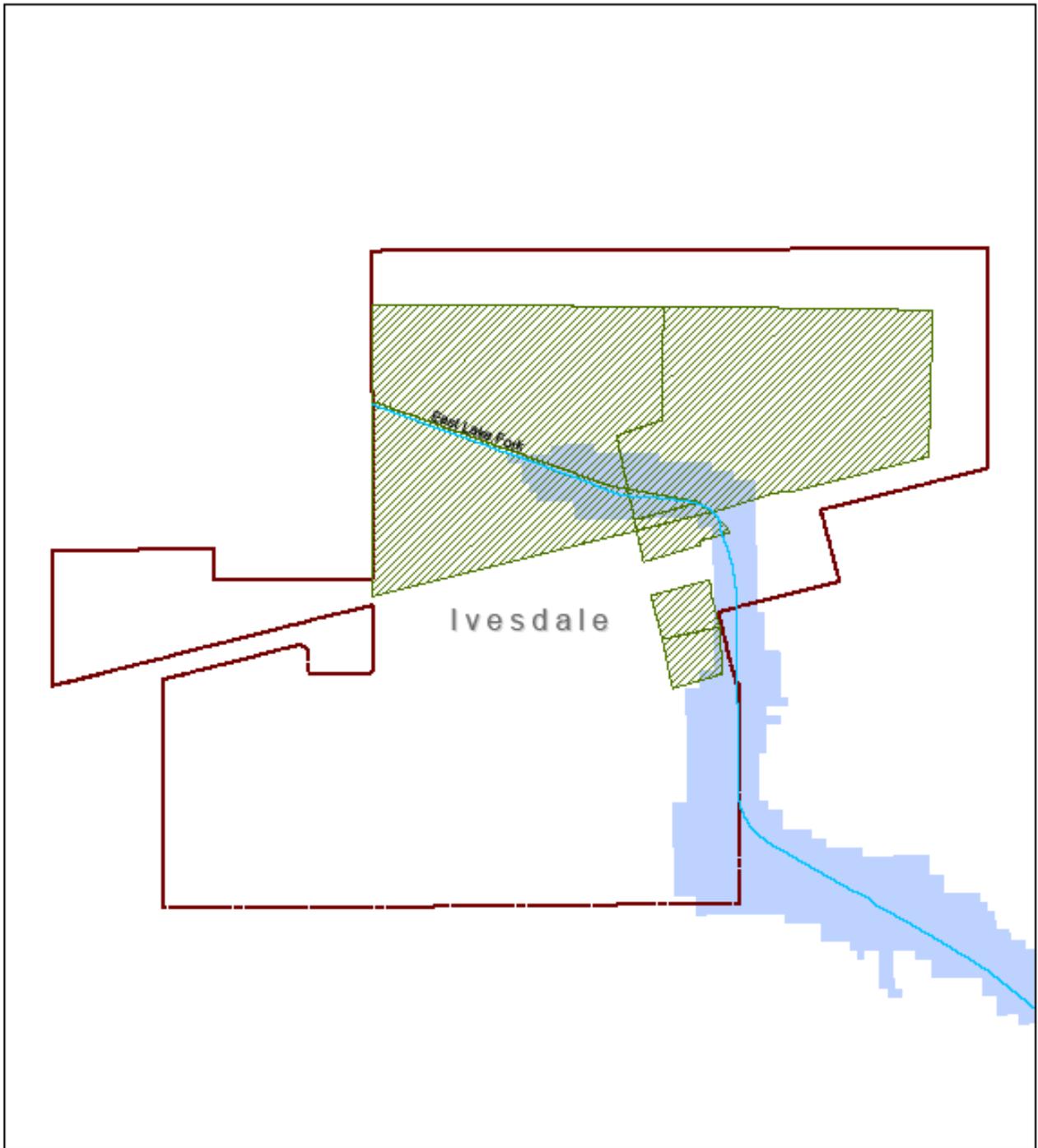
HAZUS predicts that two critical facilities in Fisher will be damaged in a 100 year flood event. The first facility is the Fisher Sewage Treatment Plant, which falls into the category of Utility Lifelines. HAZUS predicts that the facility will be 40% damaged. Translated into dollars, damage to the building is estimated at \$29,570,000. This event would render the plant inoperable until repairs are completed. The second facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under \$1000.

Debris Generation in Fisher

The model predicts that a total of 1,394 tons of debris will be generated as a result of the flood. Of this debris, 332 tons will be finishing materials, 604 tons will be structural materials, and 457 tons will be foundation materials. If the debris tonnage is converted into truckloads it will require 56 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Fisher

HAZUS estimates that 91 people will be displaced as a result of flood damage. Also estimated is that, of this group, 68 people will seek temporary shelter in public shelters.



Ivesdale Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |



0 0.125 0.25 Miles

Date of Preparation:
 August 2008

Village of Ivesdale

Building Damage in Ivesdale

HAZUS predicts minimal building damage in Ivesdale. HAZUS calculated \$254,000 in residential building damage, and \$117,000 in residential building content loss. Additionally there would be approximately \$12,000 in agricultural building damage, \$24,000 in agricultural building content loss, and \$5000 in agricultural inventory loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Ivesdale

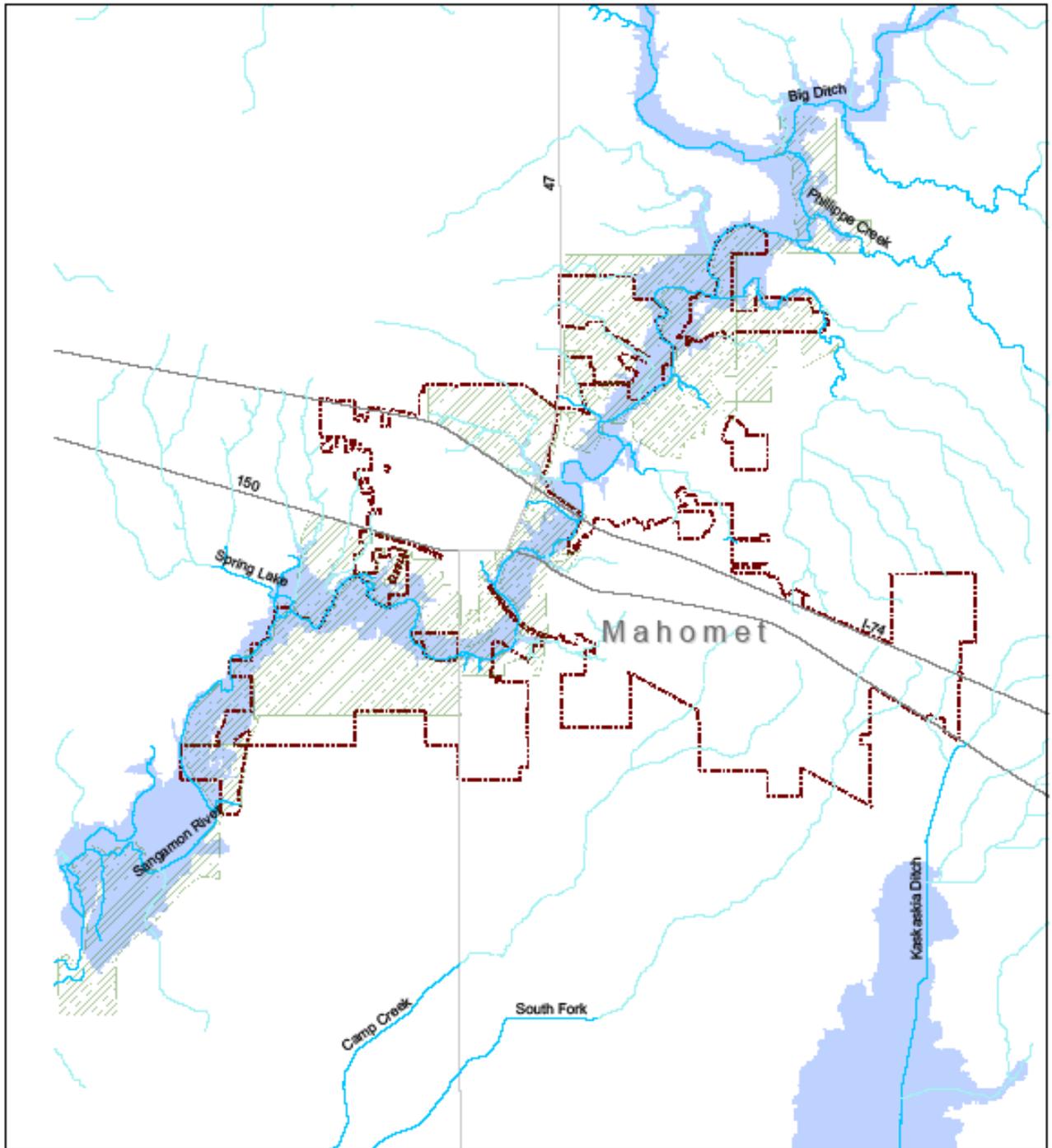
According to the model, none of the critical facilities in Ivesdale will sustain damage in a 100 year flood event.

Debris Generation in Ivesdale

The model predicts that a total of 109 tons of debris will be generated as a result of the flood. Of this debris, 31 tons will be finishing materials, 43 tons will be structural materials, and 34 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 5 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Ivesdale

HAZUS estimates that 9 people will be displaced as a result of flood damage, and that none of these people will seek publicly provided shelter.



Mahomet

Boundary Definition

Legend

- | | | |
|---|---|---|
|  Census Block in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State hwy |



0 0.5 1 Miles

Date of Preparation:
 August 2008

Village of Mahomet

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-10: Expected Mahomet Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	152	157
TOTAL	0	0	0	1	4	152	157

* Substantially damaged means greater than 50% of the building has been damaged

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-11: Expected Mahomet Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	24	24
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	128	133
TOTAL	0	0	0	1	4	152	157

*Substantially damaged means greater than 50% of the building has been damaged

The following table displays the building related economic loss estimates in Mahomet resulting from the 100 year flood event.

Table A3-12: Mahomet Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	31,506	2,690	171	610	34,977
	Content	15,040	3,725	201	681	19,647
	Inventory	0	56	38	44	138
	Subtotal	46,546	6,471	410	1335	54,762
Business Interruption						
	Income	18	19	0	2	39
	Relocation	37	3	0	0	40
	Rental Income	40	1	0	0	41
	Wage	42	26	0	16	84
	Subtotal	137	49	0	18	204
ALL	Total	46,683	6,520	410	1353	54,966

Critical Facility Damage in Mahomet

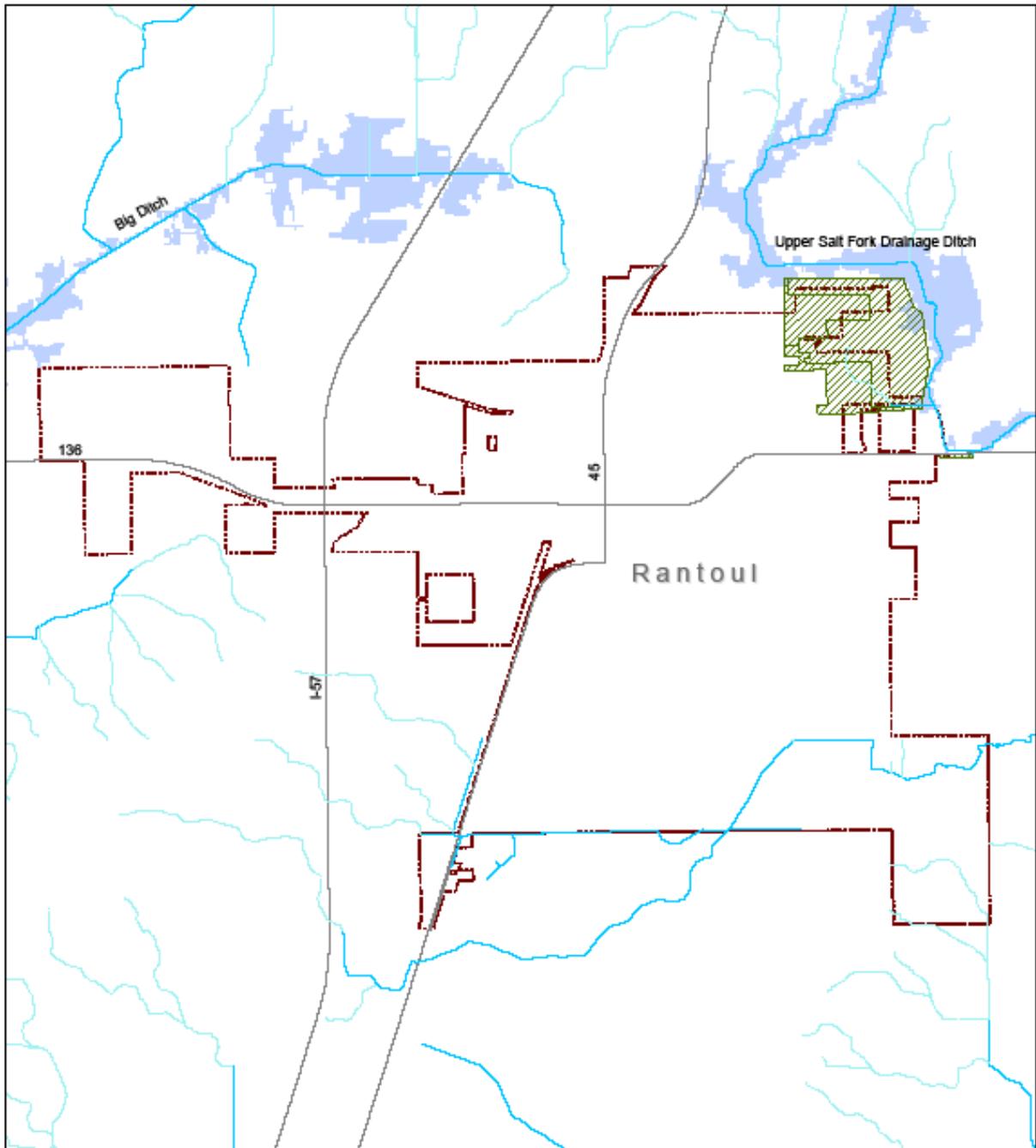
HAZUS predicts that three critical facilities in Mahomet will be damaged in a 100 year flood event. Two facilities are sewage water treatment plants. The first facility is the Mahomet Sewage Treatment Plant which falls into the category of Utility Lifelines. HAZUS predicts that the facility will be 30% damaged. Translated into dollars damage to the building is estimated at \$22,100,000. The second plant is the Sangamon Valley PWD Sewage Treatment Plant. The model predicts that this facility will be 40% damaged. Translated into dollars, damage to the facility is estimated at \$29,570,000. As a result of the damage, the plants will be rendered inoperable until repairs are made. The third facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under \$1000.

Debris Generation in Mahomet

The model predicts that a total of 18,550 tons of debris will be generated as a result of the flood. Of this debris, 3,430 tons will be finishing materials, 9,053 tons will be structural materials, and 6,067 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 742 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Mahomet

HAZUS estimates that 655 people will be displaced as a result of flood damage. Also estimated is that, of this group, 515 people will seek temporary shelter in public shelters.



Rantoul Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN



0 0.35 0.7 Miles

Date of Preparation:
 August 2008

Village of Rantoul

Building Damage in Rantoul

HAZUS predicts minimal building damage in Rantoul. When the model did its calculations for the amount of damage to buildings it came up with a figure of \$36,000 in residential building damage, and \$19,000 in residential building content loss. Additionally it is estimated that there would be \$4,000 in commercial building damage, and \$9,000 in commercial building content loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Rantoul

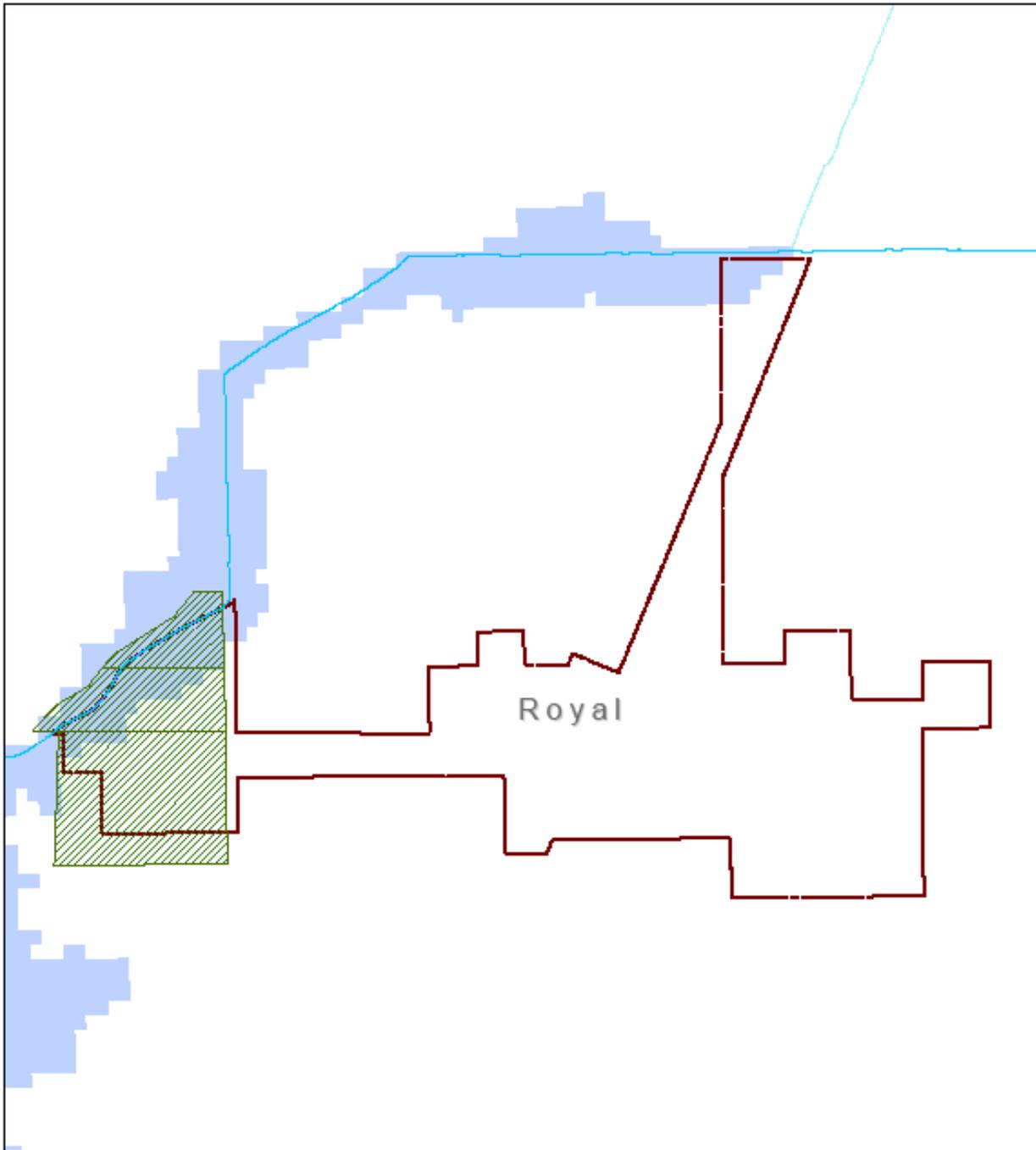
According to the HAZUS model, none of the critical facilities in Rantoul will sustain damage in a 100 year flood event.

Debris Generation in Rantoul

The model predicts that a total of only 9 tons of debris will be generated as a result of the flood. Of this debris, 5 tons will be finishing materials, 2 tons will be structural materials, and 2 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1 truckload (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Rantoul

HAZUS estimates that 5 people will be displaced as a result of flood damage, and that none of these people will seek publicly provided shelter.



Royal Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN



0 0.05 0.1 Miles

Date of Preparation:
 August 2008

Village of Royal

Building Damage in Royal

HAZUS predicts minimal building damage in Royal. The model calculated \$270,000 in residential building damage, and \$147,000 in residential building content loss. Additionally there would be approximately \$3,000 in agricultural building damage, \$5,000 in agricultural building content loss, and \$1,000 in agricultural inventory loss. HAZUS was unable to specify the exact number of buildings that would be damaged. There were no other estimated building related economic losses.

Critical Facility Damage in Royal

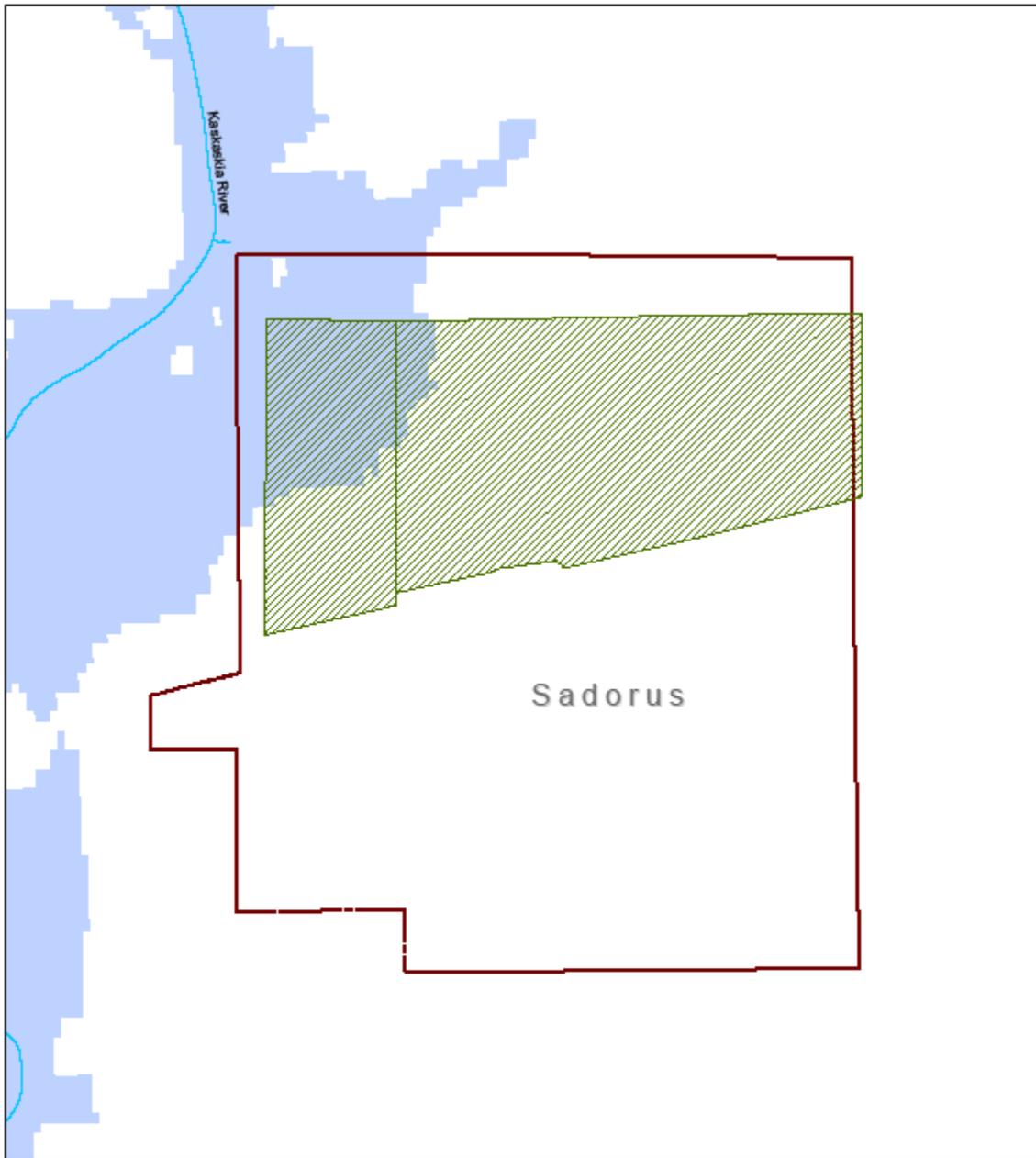
According to the model, none of the critical facilities in Royal will sustain damage in a 100 year flood event.

Debris Generation in Royal

The model predicts that a total of 106 tons of debris will be generated as a result of the flood. Of this debris, 35 tons will be finishing materials, 42 tons will be structural materials, and 28 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 5 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Royal

HAZUS estimates that 15 people will be displaced as a result of flood damage. Also estimated is that two of these people will seek temporary shelter in publicly provided shelters.



Sadorus
Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  State Hwy |
|  Municipal Boundary |  Non Intermittent Stream |  Interstates |
| |  Intermittent stream |  Federal hwy |






Date of Preparation:
 August 2008

Village of Sadorus

Building Damage in Sadorus

HAZUS predicts minimal building damage in Sadorus. When the model calculated the amount of damage to buildings, it came up with a figure of \$403,000 in residential building damage, and \$212,000 in residential building content loss. Additionally there would be approximately \$170,000 in commercial building damage, \$462,000 in commercial building content loss, and \$27,000 in commercial inventory loss. HAZUS suggests that at least one residence will sustain greater than 50% damage.

Critical Facility Damage in Sadorus

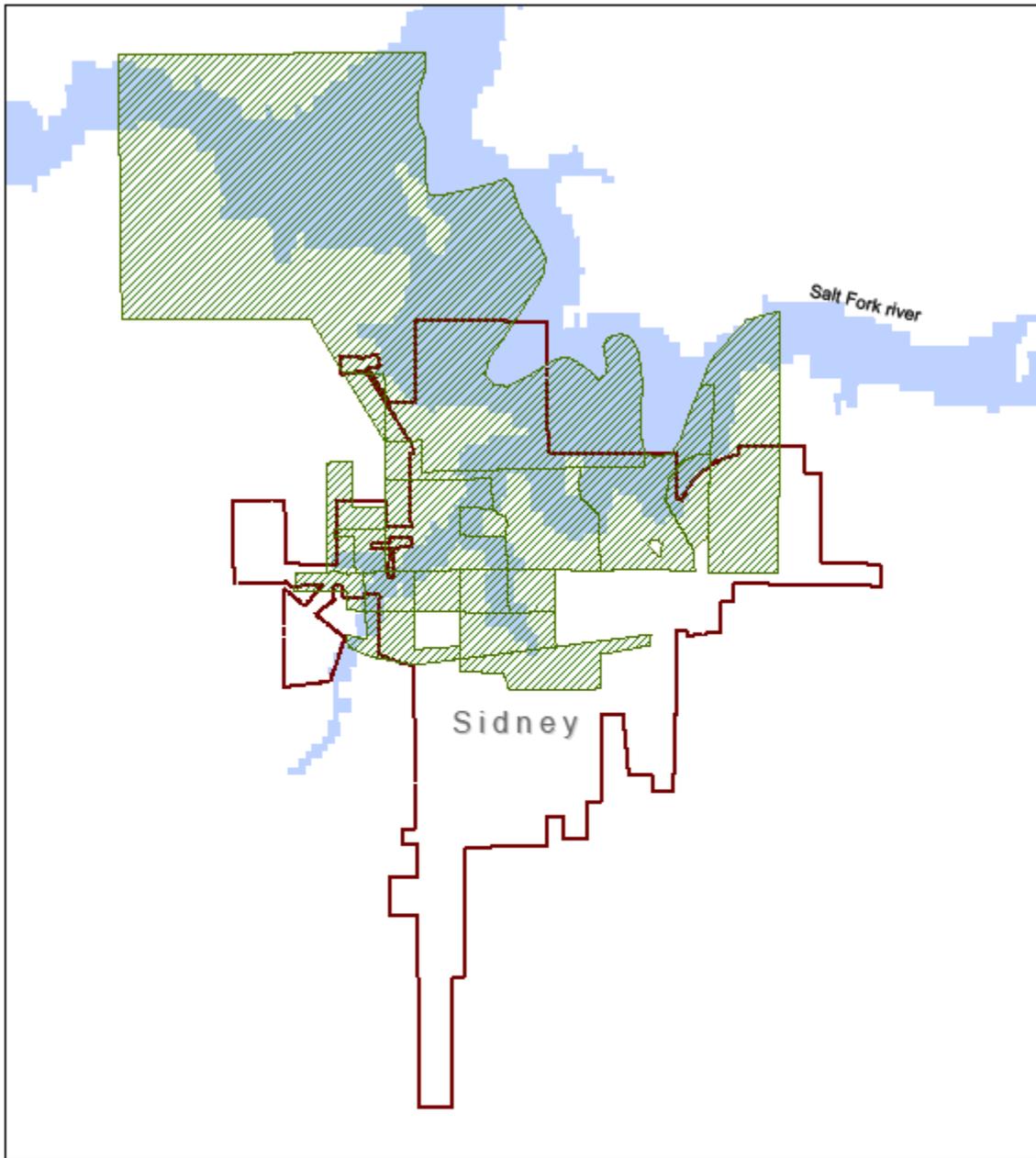
According to the model, none of the critical facilities in Sadorus will sustain damage in a 100 year flood event.

Debris Generation in Sadorus

The model predicts that a total of 247 tons of debris will be generated as a result of the flood. Of this debris, 56 tons will be finishing materials, 109 tons will be structural materials, and 82 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 50 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Sadorus

HAZUS estimates that 21 people will be displaced as a result of flood damage. Also estimated is that six of these people will seek temporary shelter in publicly provided shelters.



Sidney
 Boundary Definition
 Legend

- | | | |
|---|---|---|
|  Census Block in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State hwy |

0 0.15 0.3 Miles

Date of Preparation:
 August 2008

Village of Sidney

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-13: Expected Sidney Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	1	4	27	3
TOTAL	0	0	0	1	4	27	32

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-14: Expected Sidney Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	3	3
Steel	0	0	0	0	0	0	0
Wood	0	0	0	1	4	24	29
TOTAL	0	0	0	1	4	24	32

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Sidney resulting from the 100 year flood event.

Table A3-15: Sidney Building Related Economic Loss Estimates
 (Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	6,322	275	141	94	6,832
	Content	2,975	511	290	161	3,937
	Inventory	0	7	42	9	58
	Subtotal	9,297	793	473	264	10,827
Business Interruption						
	Income	0	3	0	0	3
	Relocation	9	0	0	0	9
	Rental Income	3	0	0	0	3
	Wage	0	4	0	18	22
	Subtotal	1	7	0	18	3
ALL	Total	9,309	800	473	282	10,864

Critical Facility Damage in Sidney

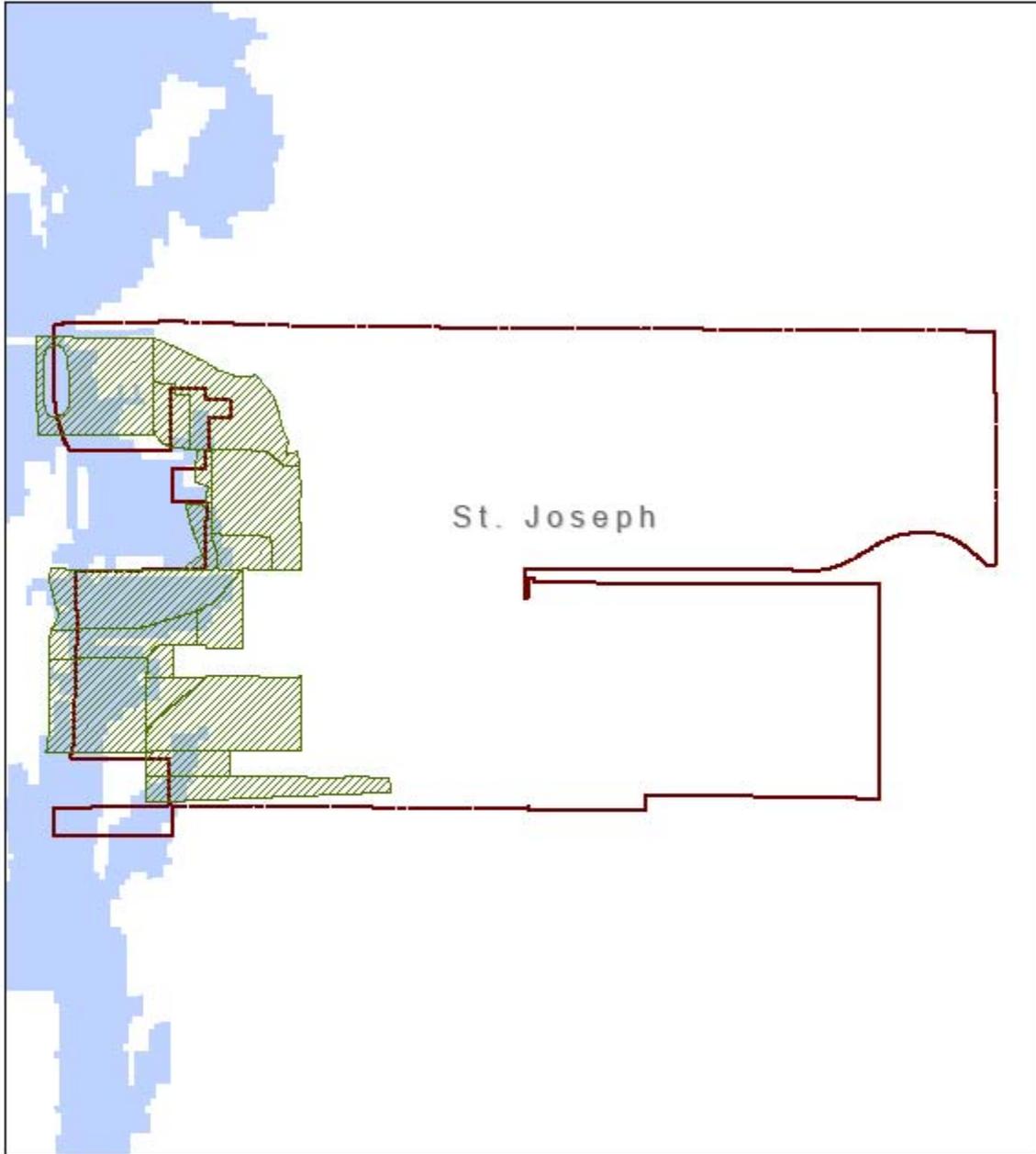
HAZUS predicts that only one critical facility in Sidney will be damaged in a 100 year flood event. This facility is the Sidney Disaster Agency, which falls into the category of Essential Facilities. HAZUS predicts that the building itself will be 17% damaged. Translated into dollars, damage to the building is estimated at \$190,650. Additionally, 81% of the contents of the building will be destroyed. Translated into dollars this will be a loss of \$1,356,000.

Debris Generation in Sidney

The model predicts that a total of 3,461 tons of debris will be generated as a result of the flood. Of this debris, 718 tons will be finishing materials, 1,545 tons will be structural materials, and 1,199 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 138 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Sidney

HAZUS estimates that 181 people will be displaced as a result of flood damage. Also estimated is that, of this group, 123 people will seek temporary shelter in public shelters.



**St. Joseph
 Boundary Definition**

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN

0 0.15 0.3 Miles

Date of Preparation:
 August 2008

N

Village of St. Joseph

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-16: Expected St. Joseph Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	0	2	18	20
TOTAL	0	0	0	0	2	18	20

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-17: Expected St. Joseph Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	0	0	0
Steel	0	0	0	0	0	0	0
Wood	0	0	0	0	2	18	20
TOTAL	0	0	0	0	2	18	20

* Substantially damaged means greater than 50% of the building has been damaged.

Table A3-18: St. Joseph Building Related Economic Loss Estimates
 (Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	4,448	226	29	33	4,736
	Content	2,075	309	33	68	2,485
	Inventory	0	1	7	0	8
	Subtotal	6,523	536	69	101	7,229
Business Interruption						
	Income	0	2	0	0	2
	Relocation	6	0	0	0	6
	Rental Income	0	0	0	0	0
	Wage	0	2	0	3	5
	Subtotal	6	4	0	3	13
ALL	Total	6,529	540	69	104	7,242

Critical Facility Damage in St. Joseph

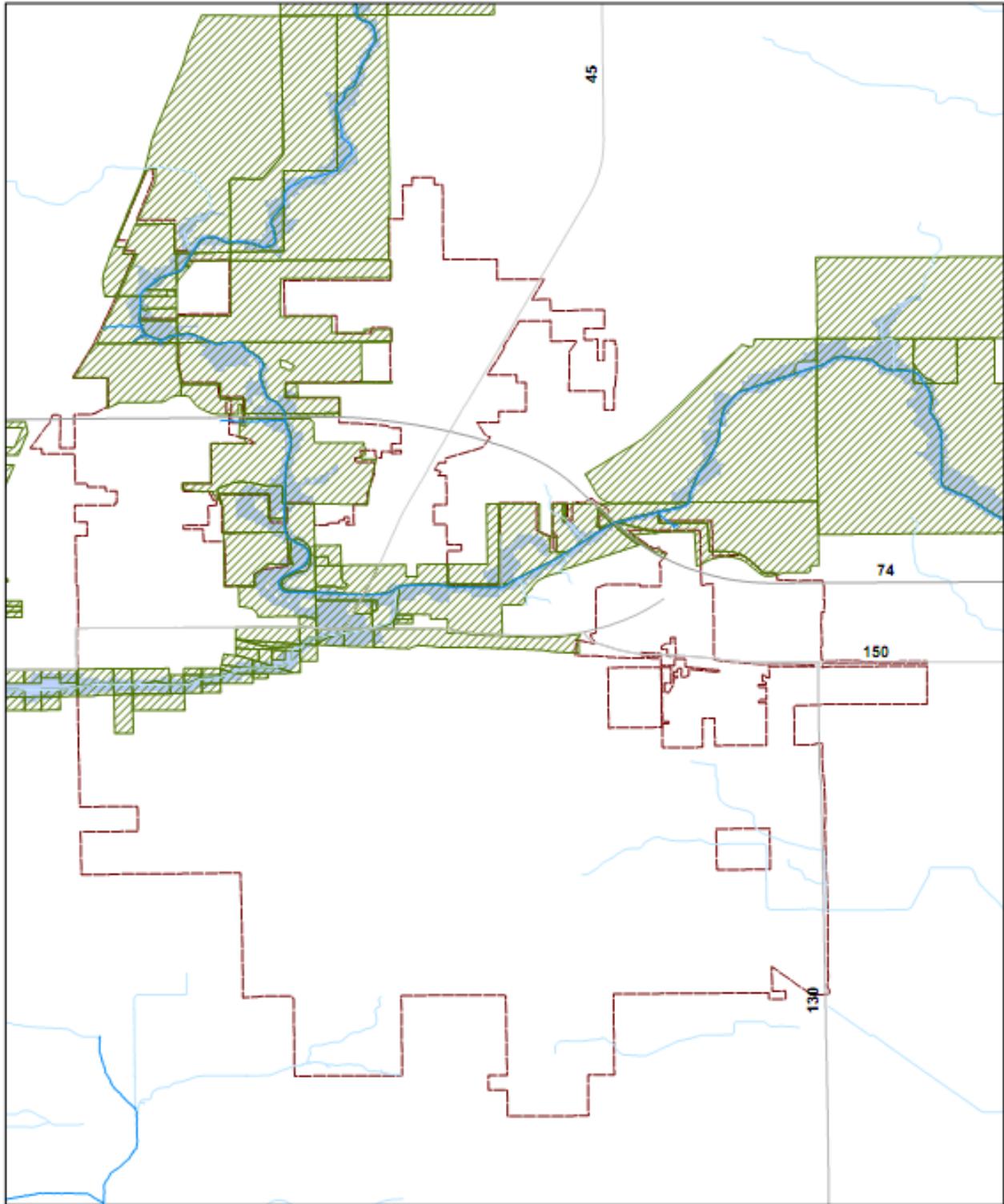
HAZUS predicts that one critical facility in St. Joseph will be damaged in a 100 year flood event. This facility is a highway bridge located in the village. HAZUS estimates that damage to the bridge will be minimal and under \$1000.

Debris Generation in St. Joseph

The model predicts that a total of 2,472 tons of debris will be generated as a result of the flood. Of this debris, 541 tons will be finishing materials, 1,088 tons will be structural materials, and 844 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 99 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in St. Joseph

HAZUS estimates that 144 people will be displaced as a result of flood damage. Also estimated is that, of this group, 42 people will seek temporary shelter in public shelters.



Urbana
Boundary Definition
Legend

- | | | |
|--|--|--|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Streams |  StateHwys |
| |  Intermittent Streams |  FedHwys |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN



0 0.5 1 Miles

Date of Preparation:
 August 2008

City of Urbana

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-19: Expected Urbana Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	3	3
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	0	2	9	50	61
TOTAL	0	0	0	2	9	53	64

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the number of damaged buildings grouped by building type which fall into each damage percentage category.

Table A3-20: Expected Urbana Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	1	1
Manufactured Housing	0	0	0	0	0	0	0
Masonry	0	0	0	0	1	4	5
Steel	0	0	0	0	0	1	1
Wood	0	0	0	2	8	18	28
TOTAL	0	0	0	2	9	24	35

* Substantially damaged means greater than 50% of the building has been damaged.

Table A3-21: Urbana Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	24,464	9,032	837	16,906	51,239
	Content	14,107	15,242	1,756	44,227	75,332
	Inventory	0	447	218	2	667
	Subtotal	38,571	24,721	2,811	61,135	127,238
Business Interruption						
	Income	1	91	0	44	136
	Relocation	21	26	0	0	47
	Rental Income	24	17	0	0	41
	Wage	2	89	0	286	377
	Subtotal	48	223	0	330	601
ALL	Total	38,619	24,944	2,811	61,465	127,839

Critical Facility Damage in Urbana

HAZUS predicts that 3 critical facilities in Urbana will be damaged in a 100 year flood event.

The first facility is University of Illinois High School. The model predicts that the building will sustain 9% damage, which is \$52,430 when translated into dollars. 66% of the contents of the building valued at \$365,140 will also be lost.

The second facility that will sustain damage is the Playtime Preschool in Urbana. Building damage is estimated at 7% or \$41,350 and content loss is estimated at 41% with a value of \$229,620.

The third facility which is predicted to be damaged is the Urbana-Champaign Sanitary District Northeast Sewage Treatment Plant. The model predicts that this plant will be rendered inoperable and sustain 30% damage or an estimated \$22,177,000. The Executive Director of the Urbana-Champaign Sanitary District provided the following comment regarding the HAZUS model estimate of damage to the Northeast Plant:

“The District is presently engaged in projects that will completely protect this facility from a 100-year plus flood event. While one of these projects won’t be completed for at least one year, the District’s past experience with flooding at this plant indicates that the amount of damage that would be sustained if a 100-year event occurred before the improvements are completed would be minimal and there would be only minor impacts on treatment plant performance. The District actually experienced just such an event in 1993... with only very minimal actual damage and a few days disruption in some operations. Most of the pathways

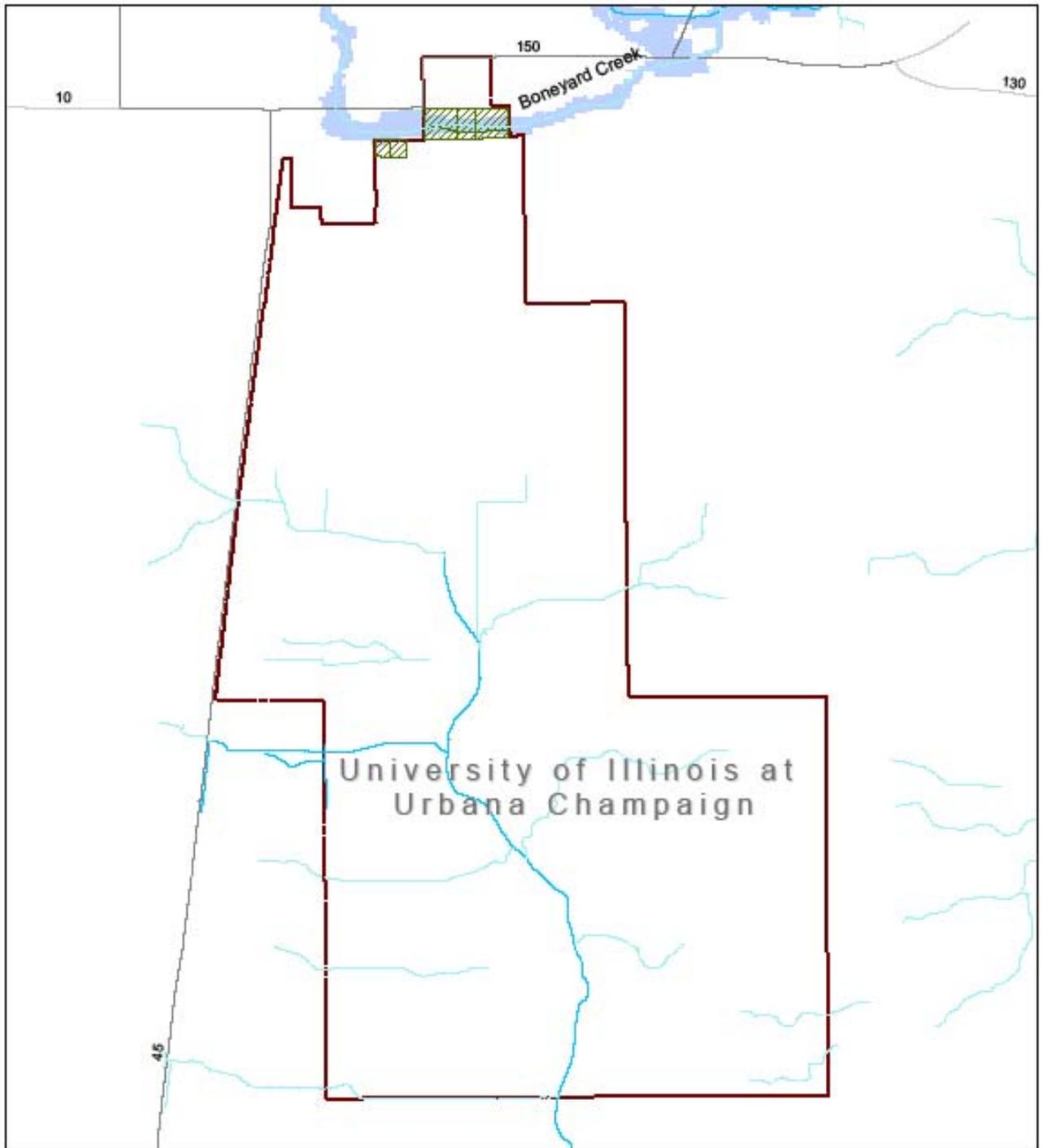
that caused those issues have already been eliminated, and the current projects will protect against the remainder. A damage estimate of more than \$22 million as stated ... is vastly exaggerated.”

Debris Generation in Urbana

The model predicts that a total of 14,824 tons of debris will be generated as a result of the flood. Of this debris, 4,073 tons will be finishing materials, 6,151 tons will be structural materials, and 4,600 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 593 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Urbana

HAZUS estimates that 1,273 people will be displaced as a result of flood damage. Also estimated is that, of this group, 1,130 people will seek temporary shelter in public shelters. A lot of these individuals will be displaced due to the inoperability of the sewage treatment plant.

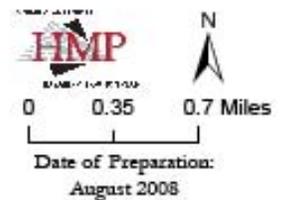


UIUC

Boundary Definition

Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  University Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |



University of Illinois

Building Damage at the University of Illinois

Although HAZUS did not specify the exact location of damaged buildings for the University, it predicts some building damage for structures located in the floodplain. The model calculated \$766,000 in residential building damage, and \$1,261,000 in residential building content loss. Additionally there would be approximately \$511,000 in commercial building damage, \$1,080,000 in commercial building content loss, and \$29,000 in commercial inventory loss. Also associated with commercial building damage, there would be an estimated \$1,000 in relocation costs, \$9,000 in income loss, \$1,000 in rental income loss, and \$6,000 in wage losses. Educational facilities would also sustain damage. The educational building damage is estimated at \$2,404,000. The content that would be lost in educational buildings would be worth \$8,300,000. Finally, the model predicts that religious or non-profit institutions would sustain \$5,000 in building damage, and \$39,000 in content loss.

Critical Facility Damage at the University of Illinois

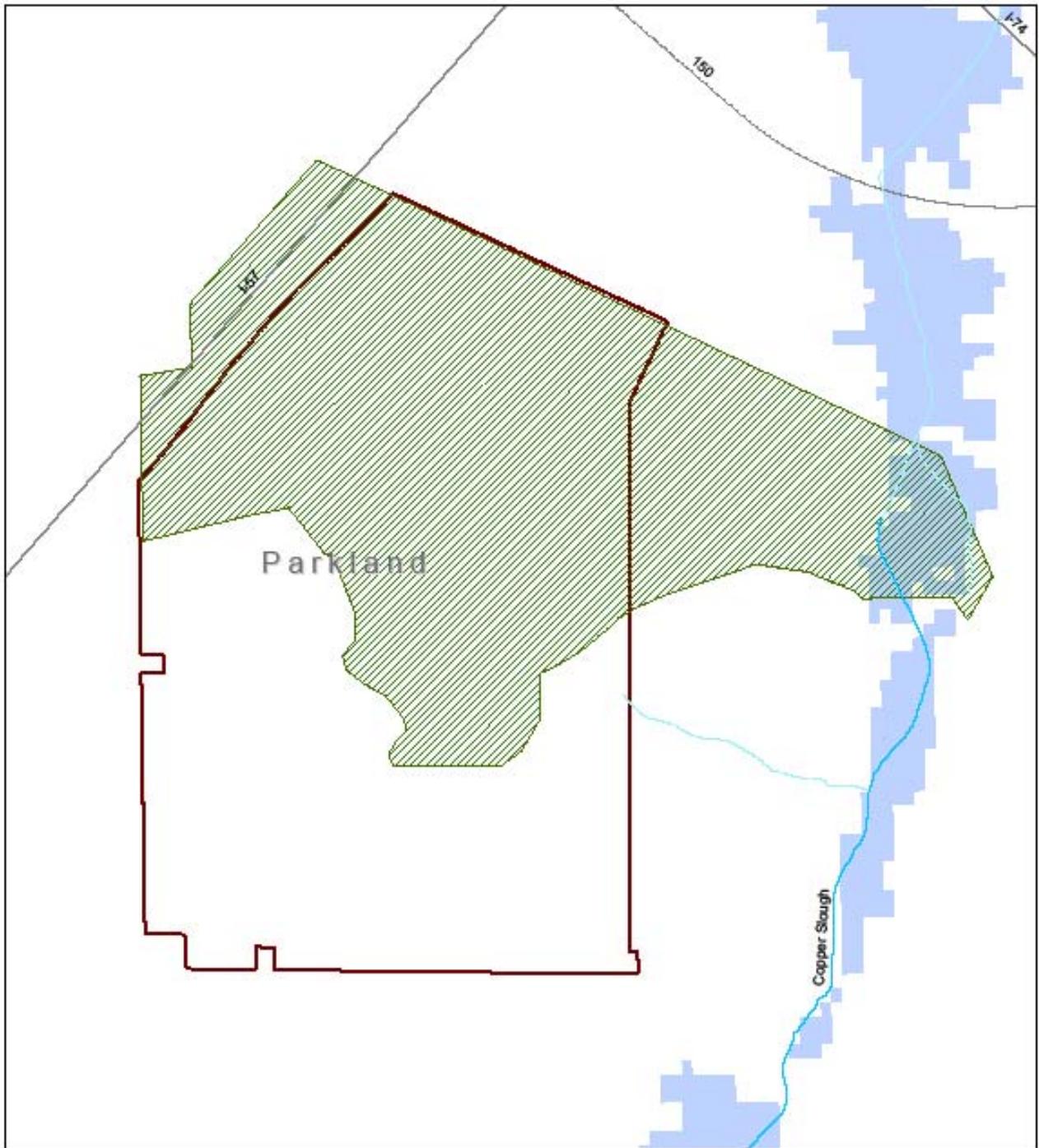
The model was not able to identify specific buildings that would be damaged. However, some of the damage that has been described above may include University of Illinois buildings, all of which are considered critical facilities.

Debris Generation at the University of Illinois

The model predicts that a total of 428 tons of debris will be generated as a result of the flood. Of this debris, 147 tons will be finishing materials, 206 tons will be structural materials, and 76 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 18 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs at the University of Illinois

HAZUS estimates that 89 people will be displaced as a result of flood damage, and that all of these individuals will seek temporary shelter in public shelters.



Parkland
 Boundary Definition
 Legend

- | | | |
|--|---|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Parkland Boundary |  Non Intermittent Stream |  Federal hwy |
| |  Intermittent stream |  State Hwy |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN



0 0.1 0.2 Miles

Date of Preparation:
 August 2008

Parkland College

Building Damage at Parkland College

The model predicts minimal damage to structures in the Parkland College main campus area. The model does predict some damage in the census block shown above; however, the main campus falls outside the 100 year floodplain. It is unlikely that the damage predicted by the model includes Parkland buildings, but HAZUS has estimated potential damage at \$2000 in residential building loss and \$1000 in residential content loss. In addition there would be an estimated \$2000 in agricultural building loss, \$4000 in content loss, and \$1000 in agricultural inventory loss.

Critical Facility Damage at Parkland College

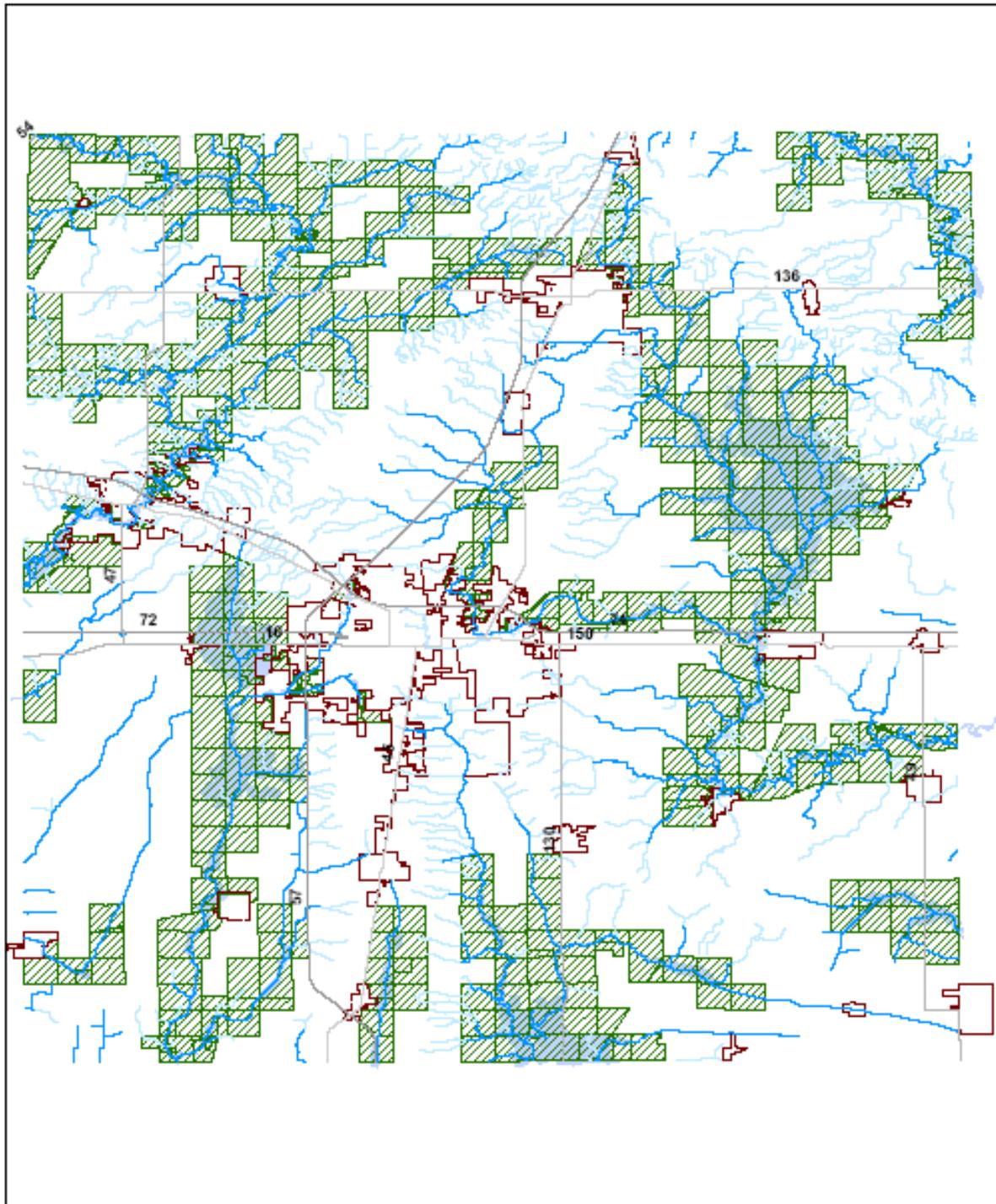
The model does not predict any of Parkland Colleges' critical facilities will be damaged.

Debris Generation at Parkland College

The model predicts that 1.4 tons of debris will be generated. This debris could be removed with 1 truck.

Shelter Needs at Parkland College

HAZUS does not predict any displaced individuals.



Unincorporated Champaign County Boundary Definition

Legend

- | | | |
|--|--|---|
|  Census Blocks in Flood Plain |  100 year flood plain |  Interstates |
|  Municipal Boundary |  Non Intermittent Streams |  StateHwys |
| |  Intermittent Streams |  FedHwys |

CHAMPAIGN COUNTY
HMP
 HAZARD MITIGATION PLAN





Date of Preparation:
 August 2008

Unincorporated Champaign County

Building Damage in Unincorporated Champaign County

The following table displays the number of buildings which HAZUS predicts will be damaged in a 100-year flood event. These damaged buildings are grouped by occupancy type and by the percentage of damage to the structure.

Table A3-22: Expected Unincorporated Champaign County Building Damage by General Occupancy Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Agriculture	0	0	0	0	0	0	0
Commercial	0	0	0	0	0	0	0
Education	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0
Religion	0	0	0	0	0	0	0
Residential	0	0	1	5	31	242	279
TOTAL	0	0	1	5	31	242	279

* Substantially damaged means greater than 50% of the building has been damaged.

Table A3-23: Expected Unincorporated Champaign County Building Damage by Building Type

	Number Damaged by Percentage of Damage to Structure						TOTAL
	1-10%	11-20%	21-30%	31-40%	41-50%	Substantially*	
Concrete	0	0	0	0	0	0	0
Manufactured Housing	0	0	0	0	0	9	9
Masonry	0	0	0	0	2	34	36
Steel	0	0	0	0	0	0	0
Wood	0	0	1	5	28	199	233
TOTAL	0	0	1	5	30	242	269

* Substantially damaged means greater than 50% of the building has been damaged.

The following table displays the building related economic loss estimates in Champaign resulting from the 100 year flood event.

Table A3-24: Unincorporated Champaign County Building Related Economic Loss Estimates
(Thousands of Dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	72,753	6,750	2,237	12,121	93,861
	Content	37,416	10,110	3,800	6,608	57,943
	Inventory	0	274	800	662	1,736
	Subtotal	110,169	17,134	6,837	19,391	153,540
Business Interruption						
	Income	0	57	0	25	82
	Relocation	68	8	0	0	76
	Rental Income	19	6	0	0	25
	Wage	3	59	0	200	262
	Subtotal	90	130	0	225	445
ALL	Total	110,259	17,264	6,837	887	2,181

Critical Facility Damage in Unincorporated Champaign County

The model does not predict damage to any of the critical facilities in unincorporated Champaign County.

Debris Generation in Unincorporated Champaign County

The model predicts that a total of 45,822 tons of debris will be generated as a result of the flood. Of this debris, 8,966 tons will be finishing materials, 21,571 tons will be structural materials, and 15,286 tons will be foundation materials. If the debris tonnage is converted into truckloads, it will require 1,019 truckloads (@25 tons/ truck) to remove all of the debris.

Shelter Needs in Unincorporated Champaign County

HAZUS estimates that 2,225 people will be displaced as a result of flood damage. Also estimated is that, of this group, 1,049 people will seek temporary shelter in public shelters.