

# Long Term Recovery Council

## FINAL REPORT

to Governor Pat Quinn &  
The People of Illinois



Aftermath of the Floods of June 2008 &  
Recommendations for Long-term  
Economic Recovery

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Office of the Vice Chancellor for Public Engagement  
University of Illinois at Urbana-Champaign



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This report is a response to recent natural disasters in the state. The report describes ways in which the State can address community and economic development as well as technical assistance after major natural disasters with an emphasis on flooding. The goal of this report is to provide a comprehensive, proactive, and research-based approach to long-term economic recovery for the areas affected by the floods.

The study group recognizes and acknowledges existing local, regional, and state efforts by many agencies and individuals to address these issues. The study group is also aware of the disconnect between what local landowners, business people, and government officials may want in the way of floodplain development and what is now considered good floodplain management practice. This disconnect points to the need for both a better public understanding of floods, flood risk, and flood management, as well as an increased sharing of more information about these topics.

Photos are provided by the Illinois State Water Survey unless otherwise noted.

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## LIST OF ACRONYMS

ACF	Annual Chance Flood
ADF	Augmented Dickey-Fuller test
ARIMA	Autoregressive Integrated Moving Average Model
ASCE	American Society of Civil Engineers
ASFPM	Association of State Floodplain Managers
BLS	Bureau of Labor Statistics
CACF	Cross-Autocorrelation Function
CEDS	Comprehensive Economic Development Strategy
CGE	Computable General Equilibrium
DCEO	Department of Commerce and Economic Opportunity
DFIRM	Digital Flood Insurance Rate Map
DOD	Department of Defense
EDA	Economic Development Administration
EDD	Economic Development District
EIIC	Eastern Iowa Industrial Center
EMA	Emergency Management Agency
EMS	Emergency Medical Services
EPA	Environmental Protection Agency
EWPP	Emergency Watershed Protection Program
FCIC	Federal Crop Insurance Corporation
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
IDES	Illinois Department of Employment Security
IDNR	Illinois Department of Natural Resources
IDOT	Illinois Department of Transportation
IEMA	Illinois Emergency Management Agency
ILTF	Interagency Levee Task Force
INHS	Illinois Natural History Survey
ISGS	Illinois State Geological Survey

ISWS	Illinois State Water Survey
MRCC	Midwestern Regional Climate Center
MSL	Mean Sea Level
NASS	National Agricultural Statistics Service
NCSL	National Conference of State Legislatures
NEMA	National Emergency Management Association
NGA	National Governors Association
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
OWR	Office of Water Resources
PACF	Partial Autocorrelation Function
REAL	Regional Economics Applications Laboratory
SAM	Social Accounting Matrices
SBA	Small Business Administration
SFHA	Special Flood Hazard Area
SSBG	Social Services Block Grant Program
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOADS	Voluntary Organizations Active in Disaster Situations

## EXECUTIVE SUMMARY

*“It is time to share responsibility and accountability for accomplishing floodplain management among all levels of government and with the citizens of the nation.”*

- Gerald E. Galloway, in a letter introducing “Sharing the Challenge: Floodplain Management into the 21<sup>st</sup> Century”, a report focusing on the 1993 floods

The Long Term Recovery Council was established after the June 2008 flooding to help develop a framework for future state disaster recovery efforts. Future efforts will help Illinois communities recover from flood events and aid the State in mitigating the damage of future floods.

Public funds for flood recovery should contribute to reduction of future flood risk. Similarly, economic development in a location subject to future flooding is not truly sustainable economic development. Any location that is prone to future flooding is not economically viable in the long term, nor is any situation that requires a larger public investment in flood protection than warranted by the economic benefits.

The Midwest floods have clearly demonstrated that structural measures alone, such as levees, do not eliminate risk, rather they contribute to a cycle of increasing risk in urban areas due to investments in areas incorrectly perceived to be safe from flooding that eventually will flood. Continued pressure from the public, officials, and elected representatives to put public investment in flood prone areas shows the need for better flood risk communication, including the mitigation options that are not well known or understood outside the community of flood management professionals.

Floods are regularly occurring events. They can even be considered predictable natural disasters whose effects can be mitigated. Even with mitigation, however, people and property remain at risk if they remain in a floodplain. Mitigation does not stop floods from occurring and can never guarantee that property or lives in floodplains will not be lost in the future--it does mean that there are ways to reduce our exposures to the consequences of flooding.

Near the southernmost tip of Illinois, the Mississippi River carries streamflow from all or portions of 25 states and portions of Canada. Heavy rains occurring throughout the Midwest in the month of June 2008 led to record flooding in Illinois and surrounding states. Twenty-five counties in Illinois were declared federal disaster areas by the Federal Emergency Management Agency (1771-DR)<sup>1</sup>. Federal assistance dollars coming in to the state thus far have totaled over \$377 million. An additional \$155 million (*to date*) of Federal Crop Insurance Payments, covering over 3 million affected acres, has been paid out.

Mitigating future disasters is a challenge shared by all levels of government (township, city, county, state, federal), as well as residents of the state. Solutions that reduce risk in the future should be the keystone of public policy today. There is evidence to support that counties are

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<sup>1</sup> “Illinois Severe Storms and Flooding”. FEMA, September 2, 2008.  
[http://www.fema.gov/news/event\\_fema?id=10107](http://www.fema.gov/news/event_fema?id=10107)

resilient in the face of disasters. When measured in terms of employment and migration, they tend to recover quickly. However, this does not reduce the importance of pre-disaster planning.

Most hazard mitigation involves some element of land use or other planning activities, such as economic development or transportation. “By preparing plans and adopting appropriate development management measures, local governments can substantially enhance prospects for a sustainable future—one in which citizens and elected officials make informed choices about using areas exposed to natural hazards in ways that will not jeopardize the long-term viability of the community.”<sup>2</sup> A theme that emerged during the statewide listening sessions is that there is an awareness of a need (and desire) for more focused regional planning efforts to occur. There is recognition that decisions made both before and during a flood event impact not just those directly affected, but also can have dramatic consequences for neighbors upstream and downstream. However, some past decisions and some of the recommendations from the listening sessions reveal a general lack of understanding of true flood risk and highlight the need to better communicate flood risk to the public and local officials.

If development occurs in a floodplain, there is a risk assumed by all taxpayers because the National Flood Insurance Program, as well as disaster assistance and recovery, are supported by public funds. We all have a stake in reducing the vulnerability of people and property to flooding. While levees can help protect against damage to life or property, they can also provide a false sense of security. Every levee has a design limit that has some probability of being exceeded by a flood. If we continue to develop in or near floodplains, the public at large, not just business and homeowners alone, assumes the risk. As flooding continues to happen, billions of public dollars will be spent getting communities back to normal.

*“It’s tough to convince people to prepare for the worst when the sun is shining and the skies are blue. It is also hard for mitigation measures to compete for funding with the many urgent and immediate emergency funding needs facing federal, state, and local governments.”*

- “Recommendations for an Effective National Mitigation Effort”, NEMA Whitepaper, July 16, 2009

The University of Illinois Long Term Recovery Council Study Group, after conducting research and analyses on the impact of the 2008 floods, has formulated the following five recommendations to the Governor and the People of Illinois:

1. Every county in Illinois should prepare and maintain a Hazard Mitigation Plan to ensure efficient and effective short-term response to, and long term recovery from, flooding and other natural disasters. Hazard Mitigation Plans should be prepared in consultation with all governmental and nongovernmental entities having jurisdiction over factors impacting the Plan, as well as the general public. Plans should utilize best practices outlined by the Federal Emergency Management Agency, which mandates community involvement, and all plans should be approved by the Federal Emergency Management Agency.

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<sup>2</sup> Burby, R.J., Deyle, R.E., Godschalk, D.R., and Olshansky, R.B. *Creating Hazard Resilient Communities Through Land-Use Planning*. Natural Hazards Review. 2005. pp. 99 – 106.

2. The State should create an Office of Long Term Recovery (OLTR) to serve as the lead entity in coordinating and implementing post disaster long term recovery efforts at the local and regional levels, with focuses on community and economic development and technical assistance with hazard mitigation planning. This authority would be supplementary and complimentary to existing local, regional, and state agency powers. The OLTR should convene a permanent, multi-agency advisory committee to develop and maintain implementation plans for flood and other disaster recovery efforts with an emphasis on coordination between various government agencies, long-term non-structural mitigation, and wrap-around service provision designed to spur long-term community and economic recovery after a disaster. This would include Federal Block Grants and Public Assistance Grants, at a minimum, as well as other state funded initiatives, to ensure the proposed activity is consistent with the Governor's Executive Order 2006-05, National Flood Insurance Program regulations, and good floodplain management. Recovery can be confusing and fast-paced, and requires coordination and rapid information flows at a level of urgency that differs from normal times.
3. State and local leaders should work together to pursue available funding for projects consistent with long-term community recovery from floods identified in the federally-funded Comprehensive Economic Development Strategy (CEDS) reports from the regions impacted by the June 2008 floods, as well as considering the recommendations of the USACE Interagency Levee Task Force.
4. The State should make investments to support the collection of stream gage data, high resolution topographic data, and land cover data, and designate a central point of contact to administer, process and distribute satellite imagery consistent with International Charter protocol (an agreement between numerous space agencies to provide a system for the collection of imagery data in disaster areas on an emergency basis (<http://www.disasterscharter.org/>)).
5. The State should support the Illinois State Water Survey and the Illinois Department of Natural Resources Office of Water Resources to review current methods for predicting future flood frequencies and magnitudes, determine the cost-effectiveness of nonstructural alternatives (NSAs) to flood risk reduction, and support the hiring of Certified Floodplain Managers for the National Flood Insurance Program (NFIP) State Coordinator's Office.

What follows are the findings determined and discovered by the Long Term Recovery Council Study Group after careful discussion, research study and participation in meetings across the State.

# Chapter I

## Overview of Flood Disaster



Long Term Recovery Council  
**FINAL REPORT**

## ***Background***

Heavy rains in 2008 produced widespread flooding across the Midwest. According to statewide average precipitation totals, the period of March–June 2008 was the wettest in Iowa’s recorded history and ranked as the 4<sup>th</sup> and 8<sup>th</sup> wettest in Indiana and Wisconsin, respectively. Total precipitation in June alone exceeded 14 inches in areas of southern Wisconsin, southwestern Iowa, and southeastern Indiana. These heavy rains contributed to record flooding in Illinois and along its border rivers. As a result of the June 2008 flooding, 25 Illinois counties were declared federal disaster areas per FEMA-1771-DR. Twenty-one of these 25 counties are located along the Mississippi, Embarras, and Wabash Rivers (Figure 1).

This chapter documents the climatic and hydrologic conditions prior to and during the flood, presents data on flood peak stages and discharges at selected gaging stations, compares the 2008 flood to other historic flood events, and presents inundation maps for selected locations. Although numerous flooding events occurred across Illinois and throughout 2008, this chapter focuses on the most severe flooding of the Mississippi, Embarras, and Wabash Rivers in June 2008.

## **Upper Mississippi River**

The Mississippi River flows along the western border of Illinois from Dubuque, Iowa to Cairo, Illinois (Figure 2). At the northwest corner of Illinois, the Mississippi River drains over 81,000 square miles and is fed primarily by rivers and streams within Minnesota and Wisconsin. As the river flows from Dubuque, Iowa to Quincy, Illinois, more than half of Iowa, as well as portions of Wisconsin, Illinois, and Missouri, drain into the Mississippi River for a total watershed area of nearly 136,000 square miles. From Quincy to Grafton, Illinois, most of the additional drainage to the Mississippi River originates from smaller rivers and streams in Missouri. At Grafton, the Illinois River, carrying flows from rivers and streams draining over 50 percent of Illinois and portions of Indiana and Wisconsin, flows into the Mississippi River. Approximately 20 miles downstream from Grafton, the Missouri River, carrying flows from all or portions of 10 states, joins the Mississippi River. As a result, the river’s total drainage area quadruples in size to approximately 700,000 square miles near St. Louis, Missouri. The Ohio River flows along the shared border of Illinois and Kentucky and joins the Mississippi at Cairo, Illinois. At this confluence near the southernmost tip of Illinois, the Mississippi River is carrying streamflow from all or portions of 25 states, as well as portions of Canada.

## **Embarras and Wabash Rivers**

In the southeastern corner of Illinois, beginning in Clark County, the Wabash River flows along the shared border of Illinois and Indiana (Figure 2). Although the headwaters of the Wabash River are located in the Ohio counties of Darke and Mercer, the river mainly consists of drainage from Indiana rivers and streams. Nearly two-thirds of Indiana lies within the Wabash River watershed. The Embarras River flows from Illinois into the Wabash River in Lawrence County, and the Wabash River’s largest tributary, the White River, flows from Indiana into the Wabash

near Mt. Carmel, Illinois in Wabash County. The Wabash River terminates in Gallatin County, joining the Ohio River as it flows towards Cairo, Illinois.

### ***Causes of 2008 Flooding***

#### **Precipitation Patterns**

Two-week rainfall totals ranging from 8 to 18 inches were widespread across portions of the Midwest. Precipitation totals for the period June 1–15, 2008, from the National Weather Service Cooperator's network and unofficial reports from the Community Collaborative Rain, Hail & Snow network were combined by the Midwestern Regional Climate Center (MRCC) to create the precipitation grid presented in Figure 3. All precipitation data were obtained from the MRCC.

#### **Upper Mississippi River**

Intense rain events in Wisconsin and Iowa in June 2008 were the driving force behind the Mississippi River flooding (Figure 3). Throughout the Upper Mississippi River basin, rain was reported nearly every day during the first two weeks of June. Table 1 lists rainfall totals from precipitation stations in major cities in the Upper Mississippi River basin during June 2008 as well as the average June rainfall for these stations for the period 1971–2000. June rainfall in the Upper Mississippi River basin has typically ranged from 3 to 5 inches.

In Milwaukee, Wisconsin, rainfall was reported on 9 of the 10 days during June 5–14, 2008, for a 10-day precipitation total of 10.94 inches. According to Bulletin 71 (Huff and Angel, 1992), this episode surpasses a 100-year storm event for a 10-day rainfall for this region of Wisconsin. In Oshkosh, Wisconsin, more than 4 inches of rain were reported on June 9, and another storm passed through four days later dropping more than 5 inches of rain on the community. This five-day storm total exceeded the 100-year storm event estimate (8.28 inches) for this region of Wisconsin. For most areas across Iowa, daily rainfall totals reported in June 2008 were not record breaking on their own. However, persistent rainfall day after day resulted in the second-wettest June on record in Iowa, the wettest being in 1947.

#### **Embarras and Wabash Rivers**

Flooding along the Embarras and Wabash Rivers was due to intense rain events that occurred in Indiana and southeastern Illinois on June 2–3, and June 6–7, 2008 (Figure 3). Precipitation totals for June 2008 for the entire Wabash River basin varied from 3 to 7 inches in the northern and southern portions of the watershed, while the central portion of the watershed experienced totals from 7 to 17 inches. Hutsonville, Illinois in Crawford County reported more than 15 inches of rain in June 2008.

On the morning of June 7, the Hutsonville Power Plant reported 7.2 inches of rainfall. In southeastern Illinois, this amount is equivalent to greater than a 50-year storm event for a 24-hour rainfall, according to Bulletin 70 (Huff and Angel, 1989). The five-day precipitation total of 9.63 inches at Hutsonville for June 3–7, 2008 nearly equaled the five-day, 100-year design



storm of 9.65 inches. Table 2 lists rainfall totals for June for precipitation stations in the Wabash River basin in Illinois (Figure 4).

### **River Stages Prior to June Storms**

The June precipitation events followed a relatively wet spring. The Mississippi, Embarras, and Wabash Rivers had already exceeded flood stage earlier that spring in many Illinois locations.

Flood stage is typically defined as the water level at which a river overflows its banks. While flood stage is not necessarily related to the elevation where structural damages occur, it does represent the water level at which hazards to life, property or commerce begin. Flood stages referred to in this report are from either *River Stages in Illinois: Flood and Damage Data* (IDNR, 2004) or the National Weather Service's Advanced Hydrologic Prediction Service Web site (2008). River stage measurements are reported in terms of the height of the water surface as measured above an arbitrary point (the established datum of that gage). Note that the stage of a river is not the same as the depth of the flow.

### **Upper Mississippi River**

Mississippi River gaging stations located along the most heavily impacted Illinois counties are identified in Figure 5. The Mississippi River was above flood stage for an extended time period in April and May from Rock Island to Grafton prior to the June floods. From mid-April to mid-May the gages at Keithsburg and Burlington, Iowa (across the river from the Illinois community of Gulfport) were above flood stage for 38 and 43 days, respectively. The Illinois community of Meyer (Adams County) is located between the Gregory Landing, Missouri gage and the Canton, Missouri gage, which both experienced river levels above flood stage for more than 41 days prior to the June storms. Grafton experienced spring flooding for seven days in March and approximately 48 days spanning April and May, but further downstream the spring flooding was much less intense. The stream gage in St. Louis barely exceeded flood stage on four different occasions from March through May and never for more than a week at a time.

### **Embarras and Wabash Rivers**

Embarras River and Wabash River gaging stations located within and along the most heavily impacted southeastern Illinois counties are identified in Figure 4. Along the Wabash River, river levels exceeded flood stage at Riverton, Indiana (United States Geological Survey (USGS) Station 03342000) following storm events during January, February, March, and May 2008. At Vincennes, Indiana (USGS Station 03343000), river levels reached or exceeded flood stage at least once a month in January–June 2008.

## ***Chronology of the June 2008 Flooding***

### **Upper Mississippi River**

The Mississippi River began cresting at Dubuque, Iowa on June 13. As the flood wave progressed downstream, the Mississippi River crested on June 17 from Rock Island to New Boston (Figure 5). Due to heavy rainfall in Iowa, the 2008 flooding on the Mississippi River was more severe at gages located downstream of major Iowa rivers. For example, the Iowa River flows into the Mississippi River approximately 3 miles downstream from the New Boston gage. This influx of water contributed to record-setting peaks on June 17 from Keithsburg to Burlington, Iowa. From Gregory Landing, Missouri to Saverton, Missouri, the river crested on June 18, and this initial crest was actually surpassed in magnitude by a second crest a few days later at locations along the Mississippi River downstream of Saverton, Missouri. The 2008 flood peak reached Grafton on June 29 and eventually passed Chester, Illinois on July 1.

The progression of the Mississippi River flood waves through selected Illinois communities from June 10–July 10, 2008 is illustrated in Figure 6. From New Boston to Grafton, the river crested at levels more than 10 feet above flood stage.

### **Embarras and Wabash Rivers**

Due to the two rain events the first week of June, an initial flood wave on the upper Embarras River passed near Camargo, Illinois close to midnight on June 4 (Figure 4). The Embarras River crested at Sainte Marie, Illinois and Lawrenceville, Illinois on June 7 and June 10, respectively. The Wabash River stations from Hutsonville, Illinois to Vincennes, Indiana also crested on June 10. The Wabash river crested four days later at Mt. Carmel, Illinois.

## ***Peak Stages and Historical Comparisons***

Peak-gage-height data from the June 2008 flooding for the Mississippi River along the Illinois border are listed in Table 3. The historic and 2008 peak stages on the Wabash River along the border of Illinois and along the Embarras River are given in Table 4. New flood peaks of record were set at three Mississippi River gaging stations, one Wabash River gaging station, and two Embarras River gaging stations.

### **Upper Mississippi River**

The 2008 flood peaks were either the highest or second highest on record at 12 of the 24 stations on the Mississippi River. Historic records were set at Keithsburg, Gladstone, and Burlington, Iowa, exceeding the records set in 1993.

Although the flood heights experienced in 2008 for select locations along the Mississippi River were nearly as high or higher than those reached in 1993, the period of time above flood stage was much shorter. For example, the flood crest reached at Burlington in 2008 was over 0.5 feet higher than the 1993 flood crest of 25.10 feet, the previous record peak. The spring flooding that

occurred (April–May) in both 1993 and 2008 were of similar duration at this location. However, the Burlington gage was above flood stage for only one month in June–September of 2008, as compared to over three months during the same time period in 1993 (Figure 7). In Quincy, the 2008 flood crest was 1.3 feet lower than the 1993 flood crest of 32.13 feet, the record peak at that location. The length of time above flood stage in 2008 was also shorter than in 1993 as illustrated in Figure 8.

Overall, the 1993 flood on the Mississippi River was more severe in terms of its magnitude, duration, spatial extent, and its impact on the region. Bhowmik et al. (1994) present a comprehensive summary of this event in Illinois State Water Survey (ISWS) Miscellaneous Publication 151, *The 1993 Flood on the Mississippi River in Illinois*.

### **Embarras and Wabash Rivers**

The hydrologic data available for the Embarras and Wabash River basins (Figure 4) are much more limited both in record length and in the number of gaging stations than data available along the Mississippi River. The 2008 flood peaks were either the highest or second highest at five of the eight stations on the Embarras and Wabash Rivers. Historic records were set at Vincennes, Indiana, Sainte Marie, Illinois and Lawrenceville, Illinois, although the station at Lawrenceville has less than 10 years of record.

The June 2008 flood peak at Camargo, Illinois was nearly 2 feet lower than its record stage set in 1994. The 2008 flood peak at Sainte Marie was the highest on record, surpassing the previous record of 26.54 feet set in 1957 by 1.5 feet. The Lawrenceville gage experienced its highest stage on record, although that station has been in operation only since 2002. A record stage was set at Vincennes, Indiana, exceeding the previous record set in 1985 by 1.5 feet.

### ***Levees***

More than 100 levees are located along the Mississippi River from Dubuque, Iowa to Cairo, Illinois. Most of these levees were built to protect agricultural land; notable exceptions include those in the St. Louis metro and Quad Cities areas, which were built to protect urban areas.

During the June floods, a number of levees overtopped or breached. It is important to note that overtopping is not considered a failure. Levees are designed and built for a certain level of protection. When flood conditions exceed that level, the levee has provided the intended level of protection and may then be overtopped per its design. Typically levees that protect primarily agricultural areas are designed for more frequent floods than those protecting urban or more highly populated areas.

### **Upper Mississippi River**

In total, 26 levees overtopped or breached along the Mississippi River between Rock Island, Illinois and St. Louis, Missouri (Figure 9). Six of the 26 overtopped or breached levee systems

are located in Illinois. Their information is summarized in Table 5. The Keithsburg levee was reportedly breached, and the other five Illinois levee systems were overtopped.

Breached or overtopped levees along the Mississippi River impacted river levels at nearby locations, as well as downstream. On June 17 across the river from Burlington, Iowa, two levees near the Illinois community of Gulfport were overtopped. This caused a sudden drop in river levels near Henderson County (Figure 6b) and further downstream. The Des Moines River flows into the Mississippi River less than 3 miles downstream from the Keokuk gage. There were multiple levee overtoppings and breaches on both sides of the Mississippi River downstream of this location. Along the entire length of Adams County, the river crested at water levels reached just prior to the last levee overtopping upstream of Quincy (Figure 6c). All 13 of the 26 overtopped or breached levees located downstream from Adams County are in Missouri.

### **Embarras and Wabash Rivers**

Three levee systems in southeastern Illinois were reported as damaged during the June 2008 flooding: Ambraw, Russell-Allison, and Sainte Marie. According to the U.S. Army Corps of Engineers (USACE), the Russell-Allison Levee and the Ambraw Levee protect about 33,000 acres of cropland and roads, more than 100 farm homes, and several small businesses. An electronic inventory of levees in the Wabash River basin is not available, so it was not possible to determine the extent of land protected by levees in this area of Illinois.

### ***Mapping areas impacted by the June 2008 Flooding***

The creation of flood peak inundation maps can be done quickly utilizing geographic information systems (GIS) when the two critical pieces of information are available: water elevation and land elevation. For those areas in the immediate vicinity of a streamgage, the water elevation is continuously monitored and the peak elevation is easily determined. This information is then combined with the highest resolution digital elevation (topographic) data available to create a map of maximum flood extent. For those areas not in the immediate vicinity of a streamgage or crest gage, flood peaks are not recorded so they must be estimated. One approach for estimating flood peaks is to dispatch field crews to survey high-water marks after floods. Another option for capturing the flood extent is the use of satellite imagery. Satellite imagery is merely a snapshot of conditions on a given day. In order to capture the maximum flood extent, that snapshot needs to be taken on the day the river crested. For large river systems, this snapshot will need to be taken on multiple days to capture the flood peak as it moves down the river. In June 2008, it took nearly three weeks for the Mississippi River flood crest to pass through Illinois. Additionally, because satellite imagery requires significant post-processing that can impact the accuracy of the mapping, supplemental information such as hydrologic and topographic data should be incorporated when available.

Producing accurate maps depicting flooded areas during the 2008 disaster was challenging because of the large geographic region inundated by the floodwaters in relation to the number of gaging stations available. One tool available this past summer was the use of satellite imagery obtained through the International Charter, an agreement between numerous space agencies to

provide a system for the collection of imagery data in disaster areas on an emergency basis (<http://www.disasterscharter.org/>). The USGS activated the International Charter in June 2008 for the significant flooding that occurred in the Midwest. Researchers from the Illinois State Geological Survey, the Illinois State Water Survey, the Illinois Natural History Survey, and Geography Department faculty from Illinois State University collaborated to process and interpret Spot multispectral satellite imagery collected over the Mississippi River floodplain during this period. Maps depicting the extent of flooding are provided for selected locations to illustrate the types of products that can be developed using this information.

The extent and frequency of flood inundation can also be estimated from an engineering study known as a Flood Insurance Study (FIS). The Federal Emergency Management Agency (FEMA) manages the National Flood Insurance Program (NFIP), which uses Flood Insurance Rate Maps (FIRM) to display the results of the FIS. These flood maps are available statewide. FIRMs depict the extent of areas with a 1% chance of flooding in any given year. This 1%-annual-chance-flood (ACF) event is also referred to as the 100-year flood or the base flood. In some areas, the FIRM will also include a boundary for the 0.2% ACF or 500-year flood. As a point of comparison, the 1% ACF and 0.2% ACF boundaries, according to the FEMA preliminary Digital-FIRMs for Henderson County and Mercer County, are included on the maps depicting the June 2008 flooding.

### **Upper Mississippi River**

Using well-established image classification protocols, surface water classifications were extracted from the original Spot multispectral images. Following these protocols, only areas with open water were classified. Locations with heavy vegetation or structures taller than the floodwaters were not classified, despite being flooded. In order to provide a more accurate representation of flooded areas, the Illinois State Water Survey used gage information at the time of imagery collection along with topographic information for the area near the gage to prepare an inundation map for Gulfport, Illinois. A map showing the extent of flooding experienced near Gulfport on June 23 along with the preliminary floodplain boundaries is shown in Figure 10. As can be seen in Figure 6b, the river stage at the time of satellite imagery collection was actually 2 to 3 feet lower than the peak flood stage at Gulfport on June 17, so the extent of flooding in this area was possibly even greater than that shown.

The Mississippi River crested at Keithsburg on June 17 at an elevation of 547.68 feet (Mean Sea Level 1912). A map showing the extent of flooding, the approximate flood depths experienced in Keithsburg at the time of this crest, and the preliminary floodplain boundaries are provided in Figure 11.

### **Embarras and Wabash Rivers**

During the Midwest flooding, Indiana also requested imagery collection through the International Charter and created maps of 2008 floodwaters as derived from Landsat-5 satellite imagery acquired on June 11, 2008. Object classification to extract open water was performed by Purdue University (2008). For map clarity, the Illinois State Water Survey removed areas of inundation along all rivers and tributaries other than the Embarras and Wabash Rivers. A map

showing the extent of flooding experienced along the Embarras and Wabash Rivers in Illinois on June 11, 2008 is shown in Figure 12. This imagery was collected as the flood wave passed Vincennes, Indiana. The flood crest reached Mt. Carmel, Illinois three days later. The approximate locations of the three damaged levees located in Illinois were digitized from FIRMs and are included in this map.

### **Western Illinois University GIS Mapping**

The information provided by Western Illinois University (Appendix A) to the Long Term Recovery Council and the Illinois Department of Commerce and Economic Opportunity is an example of the type of assessment that can be performed using maps of flood extent in combination with other GIS layers to quickly identify potentially impacted structures. Depending on the resolution of the satellite imagery and the amount of field-based verification performed, more detailed information may be needed for certain assessments.

### ***Comparison of 2008 Flooding to Estimated Flood Risks***

FEMA maps are an attempt to map the floodplain and provide an associated frequency of recurrence. To estimate the hydrologic frequency of the June 2008 flooding, the flood peaks at gaging stations have been compared to the accepted base flood elevations and associated flood discharges, where available.

### **Upper Mississippi River**

Table 6 summarizes peak river stages, peak streamflow values, and estimated stages and streamflows for 1% ACF and 0.2% ACF events as computed by the USACE (2004) for stations along the Mississippi River. The estimated recurrence interval provided in this table was determined by comparing the river stages and streamflows experienced in June 2008 to the river stages and streamflows computed by the USACE for various return intervals. To better convey the associated risk of flood, the table also includes a column displaying the annual chance of flood occurrence for events similar in magnitude to those experienced in June 2008. For example, the June 2008 flood peak at Chester, IL was somewhere between a 5- and 10-year event, so in terms of flood risk, each year there is a 10–20% chance the Mississippi River at Chester will reach levels that equal or exceed the June 2008 flood.

### **Embarras and Wabash Rivers**

Table 7 summarizes peak river stages, peak streamflow values, and estimated stages and streamflows for 1% ACF events for three USGS gaging stations on the Wabash River. The 1% ACF stages and discharges were obtained from a summary of coordinated discharges for the Wabash River prepared by the Indiana Department of Natural Resources (<http://www.in.gov/dnr/water/files/16wabashrivermodified.pdf>).

### ***Data Gaps and Monitoring Needs***

An FIS estimates flood elevations through hydrologic and hydraulic analyses that rely on a variety of data and information about precipitation, streamflow, topography, land cover/land use, flood control projects, hydraulic structures, and development in the study area. Access to the best scientific and engineering data and information will not only improve the analyses performed, but its collection and dissemination will also present opportunities to increase the dialogue between the scientific community, stakeholders, policy makers, and the general public on the technical issues involved in floodplain management. Specific recommendations include the following:

- Commit to long-term funding of streamgages and precipitation gages to improve estimates of flood frequency and magnitude and real-time flood forecasting;
- Support the height modernization program to allow for the incorporation of better topographic data into hydraulic studies;
- Create an easily accessible electronic inventory of levees in Illinois;
- Designate a point of contact in Illinois to attend training in International Charter activation and develop procedures for handling the information once requested. The process of collecting and acquiring the satellite imagery is handled smoothly on the federal level. At the state level, there is no official protocol to process, maintain, and distribute the imagery once collected.

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Table 1. Upper Mississippi River Basin Precipitation Totals for June 2008.

Station ID	Station Location	June 2008 Precipitation (inches)	Normal June Precipitation (inches)
132203	Des Moines, IA	13.45	4.69
131319	Cedar Rapids, IA	9.50	4.62
134106	Iowa City, IA	8.06	4.39
132364	Dubuque, IA	7.83	4.53
117072	Quincy, IL	9.80	3.75
117391	Rock Island, IL	9.47	4.30
217011	Rochester, MN	7.28	4.20
475479	Milwaukee, WI	12.27	3.71
476330	Oshkosh, WI	11.93	3.72
474961	Madison, WI	10.93	4.15
474373	La Crosse, WI	9.29	4.14

Source: Midwestern Regional Climate Center

Table 2. Wabash River Basin Precipitation Totals for June 2008.

Station ID	Station Name	State	June 2008 Precipitation (inches)	Normal June Precipitation (inches)
111212	Calhoun	IL	3.02	4.11
111329	Casey	IL	12.12	4.07
111691	Claremont	IL	5.08	4.11
112687	Effingham	IL	9.33	4.12
114317	Hutsonville	IL	15.08	4.13
115430	Mattoon	IL	6.89	4.10
116558	Palestine	IL	8.47	4.13
116610	Paris	IL	10.71	4.17
117345	Robinson	IL	9.62	4.11
117603	Ste Marie	IL	10.83	4.09
118684	Tuscola	IL	10.06	4.11
129112	Vincennes 4 E	IN	5.58	4.15
129113	Vincennes 5 E	IN	6.29	4.14

Source: Midwestern Regional Climate Center

Table 3. Mississippi River Historic and 2008 Peak Stages

Gaging Station	River Mile	Gage Datum	Vertical Datum	Flood Stage (ft)	2008 Peak Stage (ft)	2008 Peak Stage (date)	Feet over Flood Stage	2008 Peak Stage Rank	Historic Peak Stage (ft)	Historic Peak Stage (year)
Mississippi River										
Fulton, IL	522.4	568.70	MSL 1912	16	19.08	6/16	3.1	11	25.03	1965
Camanche, IA	511.9	563.21	MSL 1912	17	21.16	6/15	4.2	9	24.65	1965
Le Claire, IA	493.3	557.08	MSL 1912	11	14.84	6/16	3.8	4	17.75	1965
Rock Island, IL	482.9	542.50	MSL 1912	15	21.49	6/17	6.5	5	22.63	1993
Illinois City, IL	457.2	533.79	MSL 1912	15	22.96	6/17	8.0	3	24.1	1993
Muscatine, IA	453.0	530.74	MSL 1912	16	24.43	6/17	8.4	3	25.61	1993
New Boston, IL	437.1	526.57	MSL 1912	15	25.05	6/17	10.1	2	25.9	1993
Keithsburg, IL	427.4	523.19	MSL 1912	14	24.49	6/17	10.5	1	24.49	2008
Gladstone, IL	410.5	518.52	MSL 1912	10	22.46	6/17	12.5	1	22.46	2008
Burlington, IA	403.2	511.45	MSL 1912	15	25.73	6/17	10.7	1	25.73	2008
Keokuk, IA	364.2	477.83	MSL 1912	16	26.92	6/17	10.9	2	27.58	1993
Gregory Landing, MO	352.9	472.71	MSL 1912	15	27.60	6/18	12.6	2	28.49	1993
Canton, MO	343.2	468.50	MSL 1912	14	27.49	6/18	13.5	2	27.88	1993
Quincy, IL	327.0	458.59	MSL 1912	17	30.80	6/18	13.8	2	32.13	1993
Quincy, IL	324.9	457.80	MSL 1912	17	29.59	6/18	12.6	2	31.3	1993
Hannibal, MO	309.0	449.43	MSL 1912	16	29.54	6/18	13.5	2	31.8	1993
Saverton, MO	301.2	446.10	MSL 1912	16	27.97	6/18	12.0	2	29.58	1993
Louisiana, MO	282.9	437.33	NGVD 29	15	26.96	6/23	12.0	3	28.28	1993
Lock & Dam 24	273.3	421.81	NGVD 29	25	36.70	6/23	11.7	3	37.69	1993
Lock & Dam 25	241.3	407.00	NGVD 29	26	37.08	6/27	11.1	2	39.62	1993
Grafton, IL	218.0	403.79	NGVD 29	18	30.80	6/29	12.8	4	38.15	1993
St. Louis, MO	179.6	379.94	NGVD 29	30	38.67	7/1	8.7	*	49.58	1993
Chester, IL	109.9	341.05	NGVD 29	27	39.46	7/1	12.5	10	49.53	1993

Source: U.S. Army Corps of Engineers, U.S. Geological Survey, and National Weather Service

River Mile for these locations is defined as the distance in miles along the Mississippi River as measured from its confluence with the Ohio River.

\*Note: 2008 peak stage not ranked in top 10.

Table 4. Wabash and Embarras River Historic and 2008 Peak Stages

Gaging Station	River Mile	Gage Datum	Vertical Datum	Flood Stage (ft)	2008 Peak Stage (ft)	2008 Peak Stage (date)	Feet over Flood Stage	2008 Peak Stage Rank	Historic Peak Stage (ft)	Historic Peak Stage (year)
Wabash River										
Hutsonville, IL	N/A	420.00	NGVD 29	16	28.40	6/10	12.4	6	29.80	1913
Riverton, IN	162.0	414.65	NGVD 29	15	26.56	6/10	11.6	2	29.36	1943
Vincennes, IN	129.6	394.43	NGVD 29	17.5	30.79	6/11	13.3	1	30.79	2008
Vincennes, IN	N/A	394.43	NGVD 29	16	27.50	6/10	11.5	3	29.33	1943
Mt. Carmel, IL	94.4	369.46	NGVD 29	19	33.24	6/14	14.2	2	33.95	2005
Embarras River										
Camargo, IL	166.5	622.30	NGVD 29	N/A	15.98	6/4	N/A	5	17.33	1994
Ste. Marie, IL	48.2	445.75	NGVD 29	19	28.06	6/7	9.1	1	28.06	2008
Lawrenceville, IL	6.7	382.62	NGVD 29	30	42.32	6/10	12.3	1*	42.32	2008

Source: U.S. Army Corps of Engineers, U.S. Geological Survey, and National Weather Service  
River Mile for these locations is defined as the distance in miles along the river as measured from its mouth.  
\*Note: Lawrenceville gage record only begins in 2002.

Table 5. Illinois Levees Damaged during June 2008 Flood

Name	Type	Acreage	Date/Time Inundation	
Keithsburg	Non-Federal	Residential	115	6/14/2008 9:00
Henderson #3	Non-Federal	Agricultural	2560	6/14/2008 23:00
Henderson #1	Federal	Agricultural	6163	6/17/2008 5:30
Henderson #2	Federal	Agricultural	6970	6/17/2008 5:30
Hunt Lima	Federal	Agricultural	17029	6/18/2008 1:30
Indian Grave Lower	Federal	Agricultural	6959	6/18/2008 5:00

Source: U.S. Army Corps of Engineers

Table 6. Mississippi River 2008 Peak Stages and Discharges

Gaging Station	River Mile	June 2008 Flood Peaks					Estimated 100-year (1% ACF) Event		Estimated 500-year (0.2% ACF) Event	
		Stage (ft)	Elevation (NGVD29)	Discharge (cfs)	Recurrence Interval (years)	Annual Chance (%)	Elevation (NGVD29)	Discharge (cfs)	Elevation (NGVD29)	Discharge (cfs)
Mississippi River										
Fulton, IL	522.4	19.08	587.2	211,000	10 - 25	4 - 10	592.8	283,000	595.2	337,000
Camanche, IA	511.9	21.16	583.7	208,000	10 - 25	4 - 10	587.7	283,000	590.0	337,000
Le Claire, IA	493.3	14.84	571.4	236,000	10 - 25	4 - 10	576.0	289,000	579.0	344,000
Rock Island, IL	482.9	21.49	563.5	280,000	50 - 100	1 - 2	565.8	290,000	568.3	345,000
Illinois City, IL	457.2	22.96	556.3	294,000	50 - 100	1 - 2	557.7	318,000	559.9	379,000
Muscatine, IA	453.0	24.43	554.7	313,000	50 - 100	1 - 2	556.1	319,000	558.1	380,000
New Boston, IL	437.1	25.05	551.2	364,000	200 - 500	0.2 - 0.5	550.8	315,000	553.0	370,000
Keithsburg, IL	427.4	24.49	547.2	443,000	> 500	< 0.2	544.3	346,000	546.1	406,000
Gladstone, IL	410.5	22.46	540.5	449,000	> 500	< 0.2	537.5	346,000	539.7	406,000
Burlington, IA	403.2	25.73	536.7	459,000	> 500	< 0.2	534.2	349,000	536.0	414,000
Keokuk, IA	364.2	26.92	504.2	520,000	> 500	< 0.2	501.0	366,000	504.0	428,000
Gregory Landing, MO	352.9	27.60	499.9	N/A	> 500	< 0.2	496.2	397,000	499.0	505,000
Canton, MO	343.2	27.49	495.6	554,000	> 500	< 0.2	492.1	402,000	495.0	510,000
Quincy, IL	327.0	30.80	489.1	494,000	200 - 500	0.2 - 0.5	486.8	425,000	490.0	529,000
Quincy L&D 21	324.9	29.59	487.1	477,000	200 - 500	0.2 - 0.5	485.7	426,000	488.8	529,000
Hannibal, MO	309.0	29.54	478.6	493,000	200 - 500	0.2 - 0.5	477.1	441,000	480.1	536,000
Saverton, MO	301.2	27.97	473.7	469,000	100 - 200	0.5 - 1	472.3	442,000	475.1	537,000
Louisiana, MO	282.9	26.96	464.3	491,000	200 - 500	0.2 - 0.5	463.2	443,000	466.0	545,000
Lock & Dam 24	273.3	36.70	458.5	474,000	100 - 200	0.5 - 1	456.9	443,000	459.7	545,000
Lock & Dam 25	241.3	37.08	444.1	417,000	50 - 100	1 - 2	445.2	443,000	447.5	545,000
Grafton, IL	218.0	30.80	434.6	468,000	50 - 100	1 - 2	439.0	488,000	443.0	585,000
St. Louis, MO	179.6	38.67	418.6	719,000	10 - 25	4 - 10	426.0	910,000	430.5	1,120,000
Chester, IL	109.9	39.46	380.5	696,000	5 - 10	10 - 20	389.0	948,000	392.2	1,140,000

Source: U.S. Army Corps of Engineers, U.S. Geological Survey, and National Weather Service

Table 7. Wabash River 2008 Peak Stages and Discharges

Station Name	USGS Station ID	June 2008 Flood Peaks			Estimated 100-year (1% ACF) Event	
		Stage (ft)	Elevation (NGVD29)	Discharge (cfs)	Elevation (NGVD29)	Discharge (cfs)
Riverton, IN	03342000	26.56	441.2	98,100	444.1	160,000
Vincennes, IN	03343000	30.79	425.2	N/A	427.1	150,000
Mt. Carmel, IL	03377500	33.24	402.7	255,000	404.3	315,000

Source: U.S. Geological Survey and Indiana Department of Natural Resources

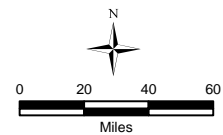
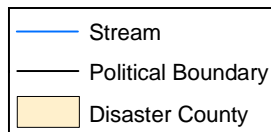
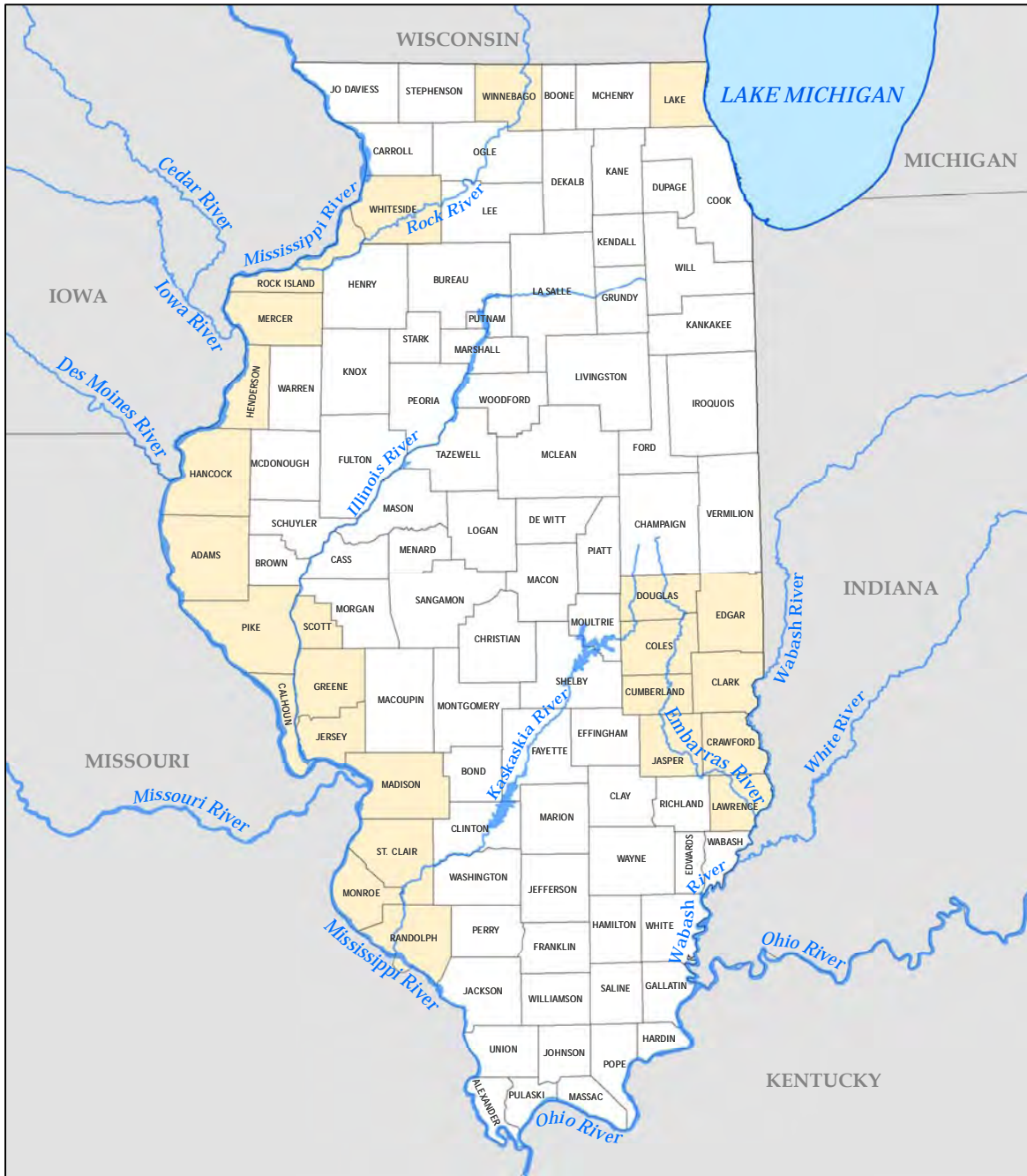


Figure 1. Illinois counties declared federal disaster areas as a result of June 2008 flooding

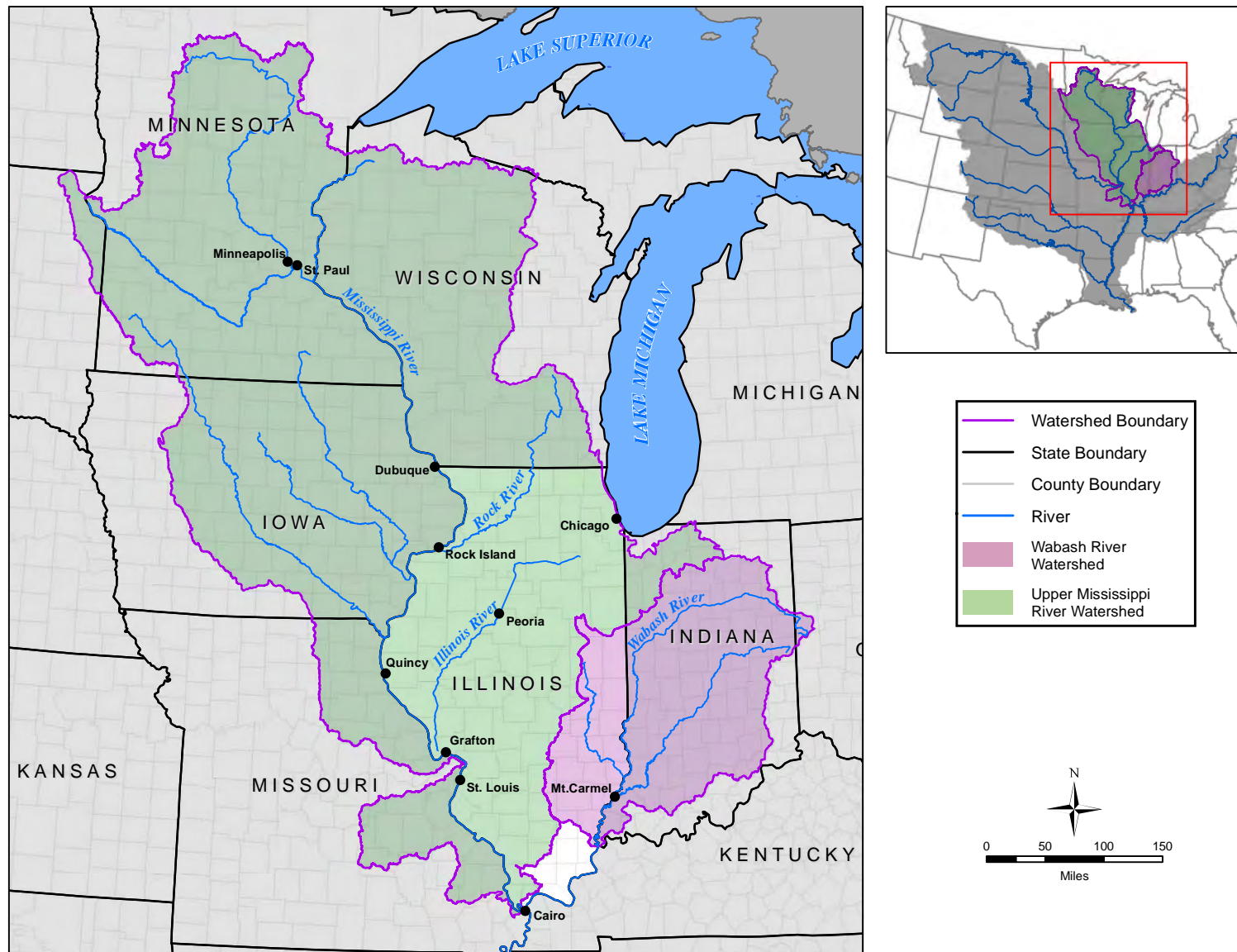


Figure 2. Upper Mississippi River and Wabash River watersheds. Illinois is situated at the intersection of both watersheds and thus impacted by flooding on the Mississippi River on the western border and on the Wabash River on the southeastern border.

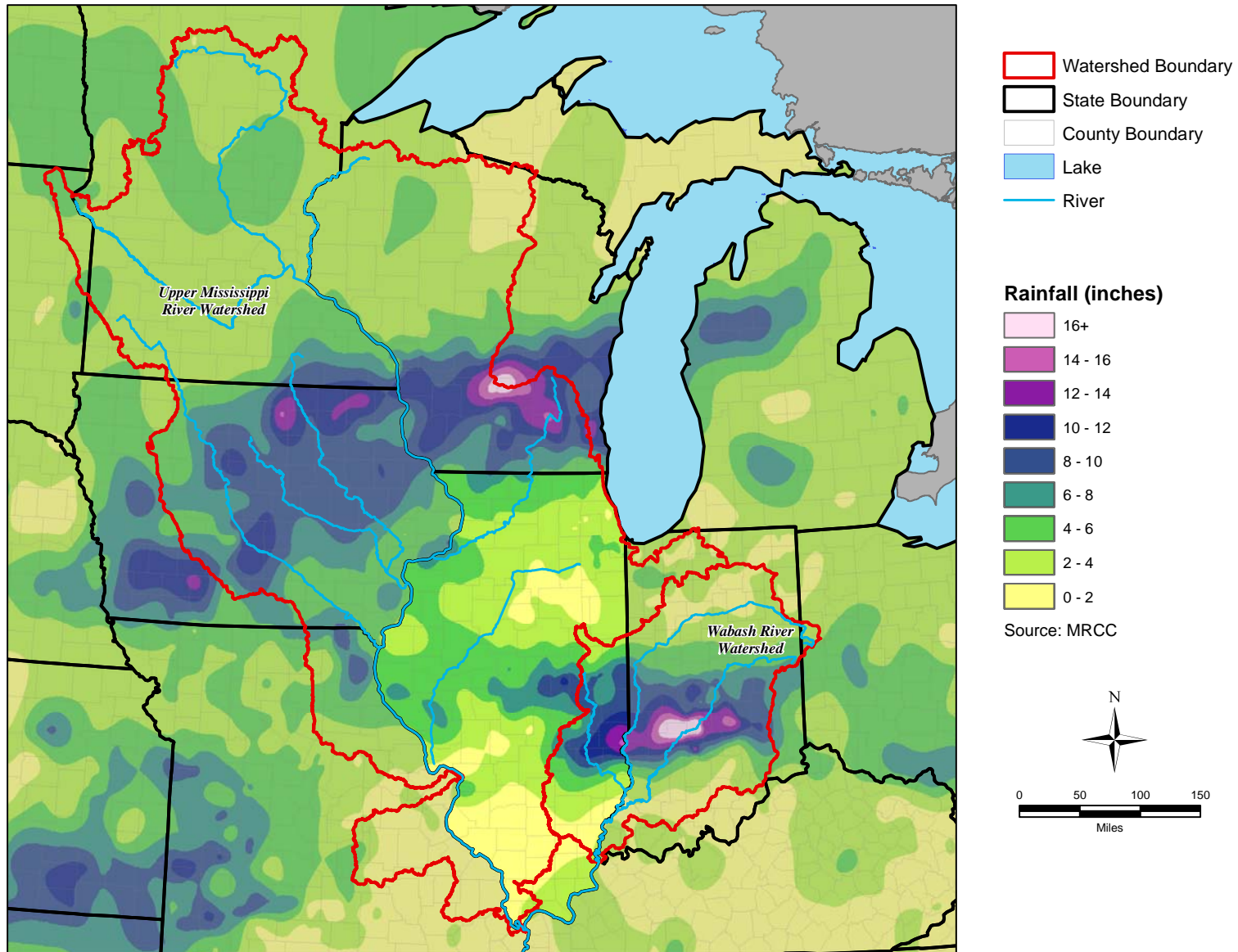


Figure 3. Midwest rainfall totals June 1–15, 2008. The intense rainfall over Iowa and Wisconsin in the Upper Mississippi River basin and in central Indiana and southeastern Illinois in the Wabash River basin were the major causes of the June 2008 floods.



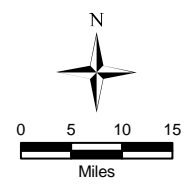
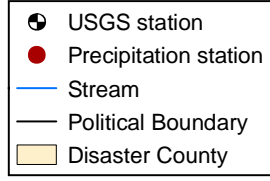
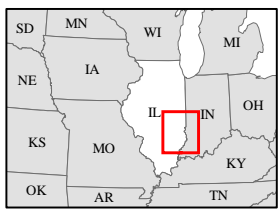
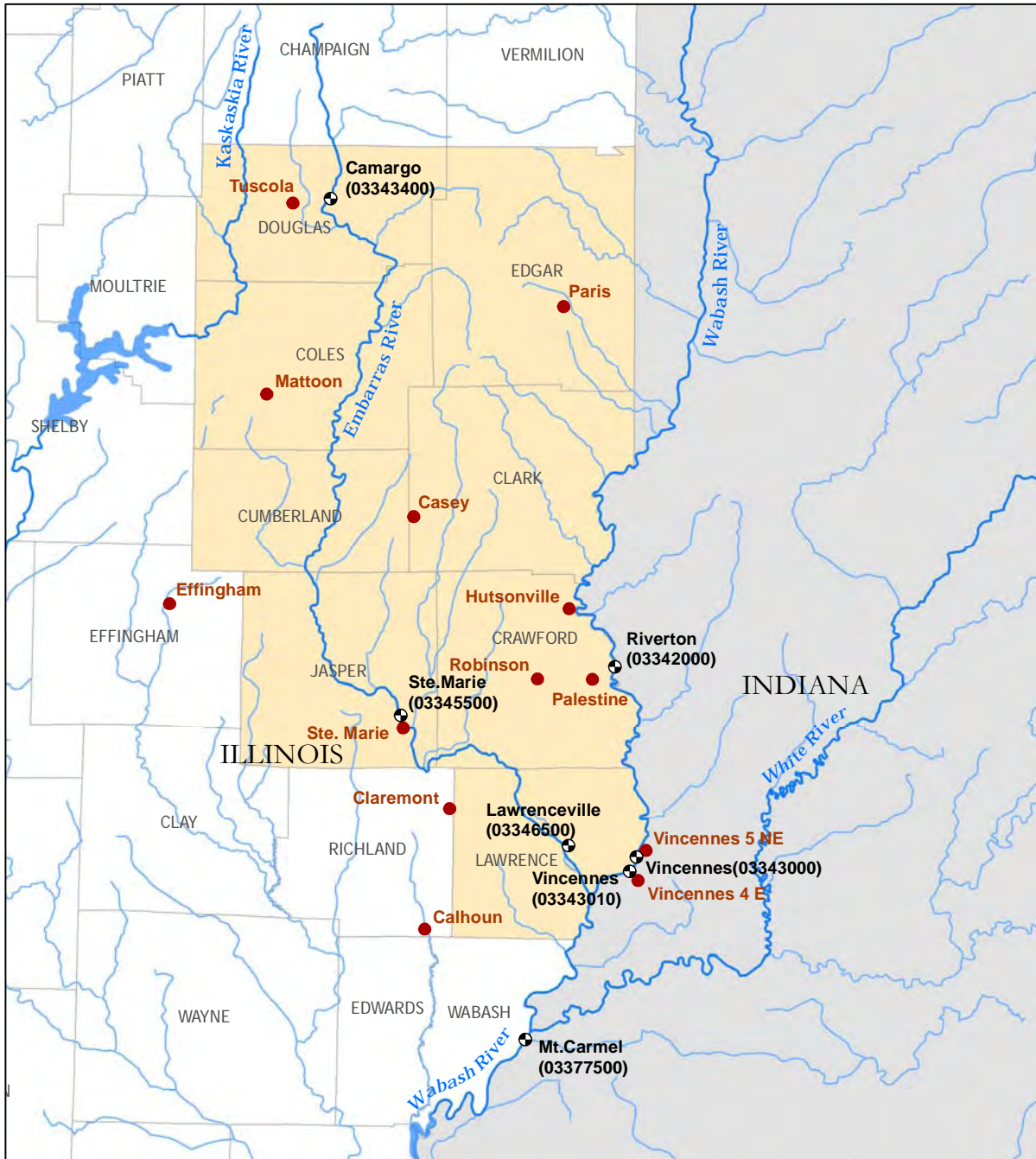


Figure 4. Location of precipitation and streamgaging stations near the southeastern Illinois counties affected by June 2008 flooding

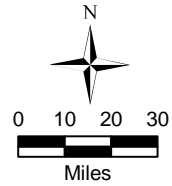
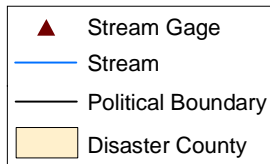


Figure 5. Mississippi River gaging stations

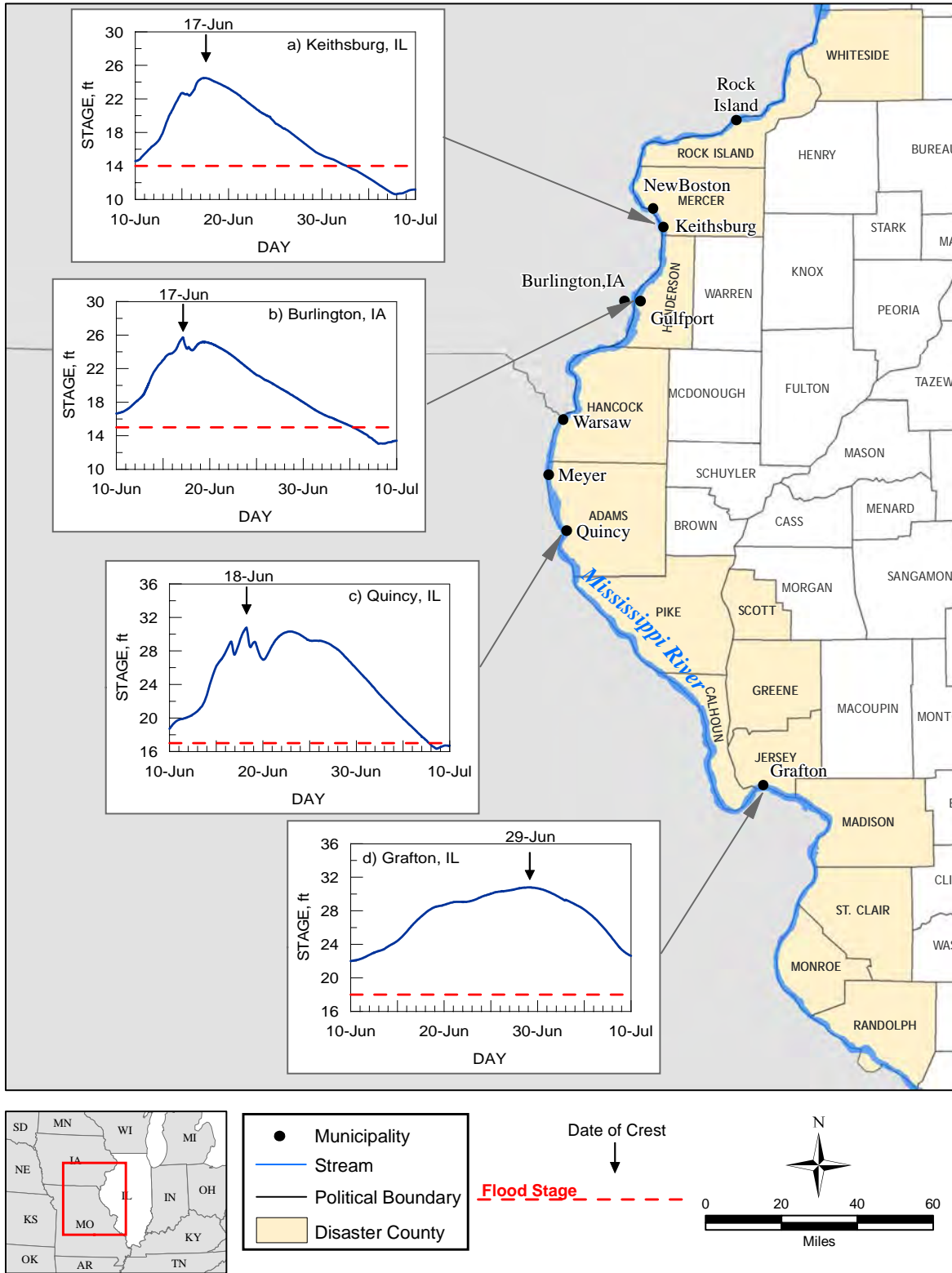


Figure 6. Mississippi River flood stages in 2008 at a) Keithsburg, IL b) Burlington, IA c) Quincy, IL and d) Grafton, IL. The river levels for the period are shown as compared to flood stages (red dashed line); the arrows indicate the dates the flood wave peaked at these stations.

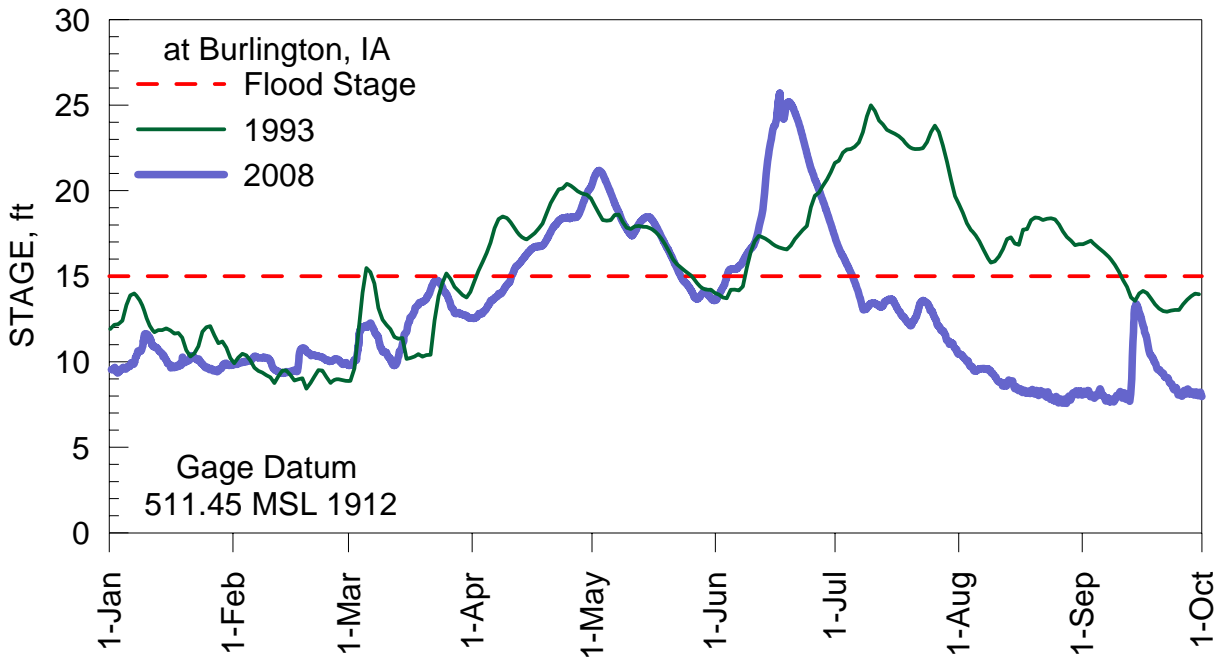


Figure 7. Comparison of Mississippi River stages January 1–October 1 at Burlington, IA during the floods of 1993 (thin green line) and 2008 (thick blue line)

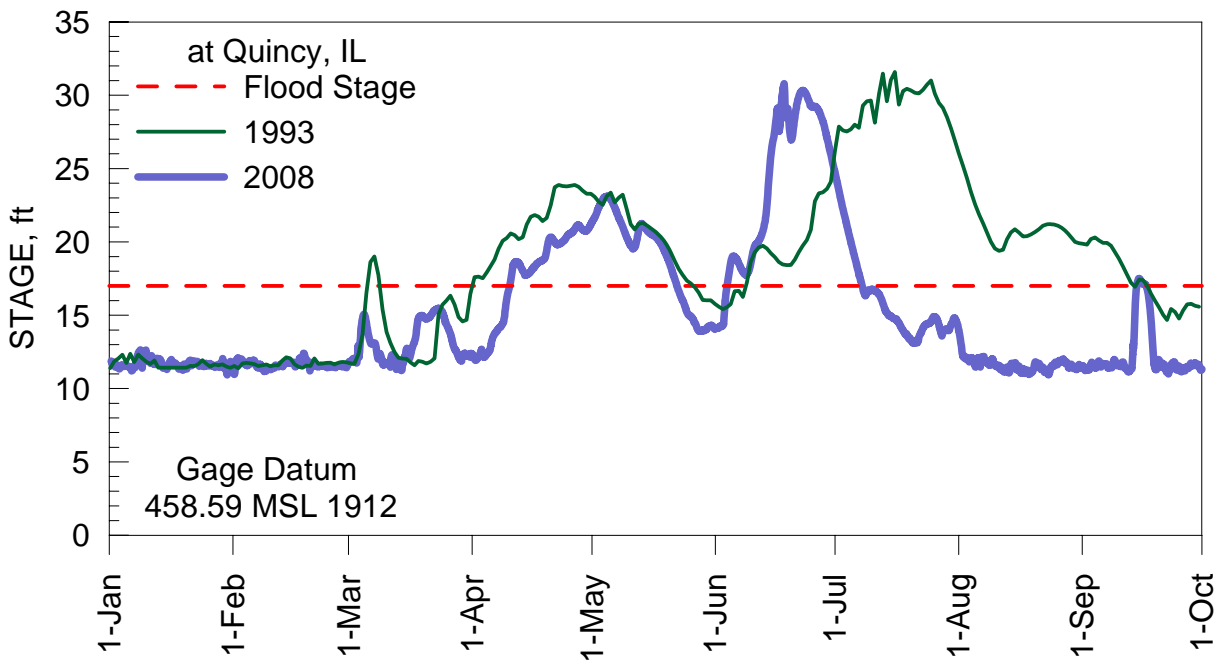


Figure 8. Comparison of Mississippi River stages January 1–October 1 at Quincy, IL during the floods of 1993 (thin green line) and 2008 (thick blue line)

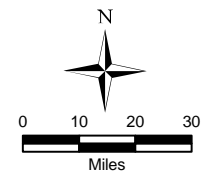
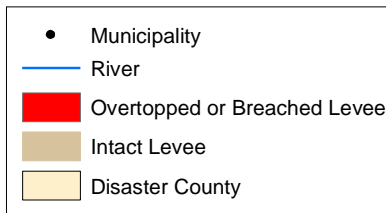
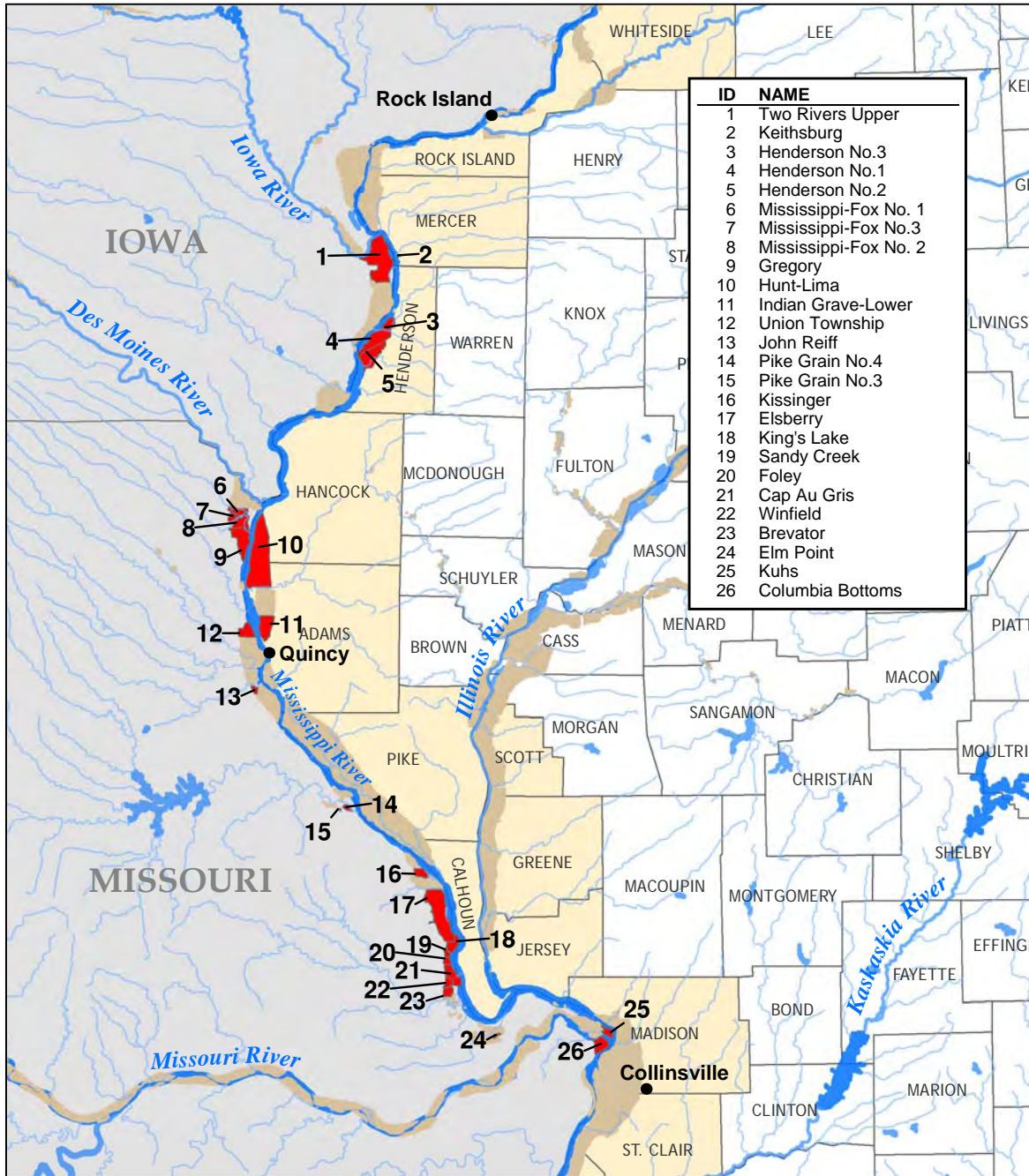


Figure 9. Location of 26 levees overtopped or breached during June 2008 along the Mississippi River between Rock Island, IL and Collinsville, IL

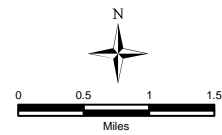
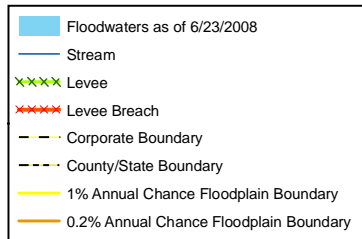
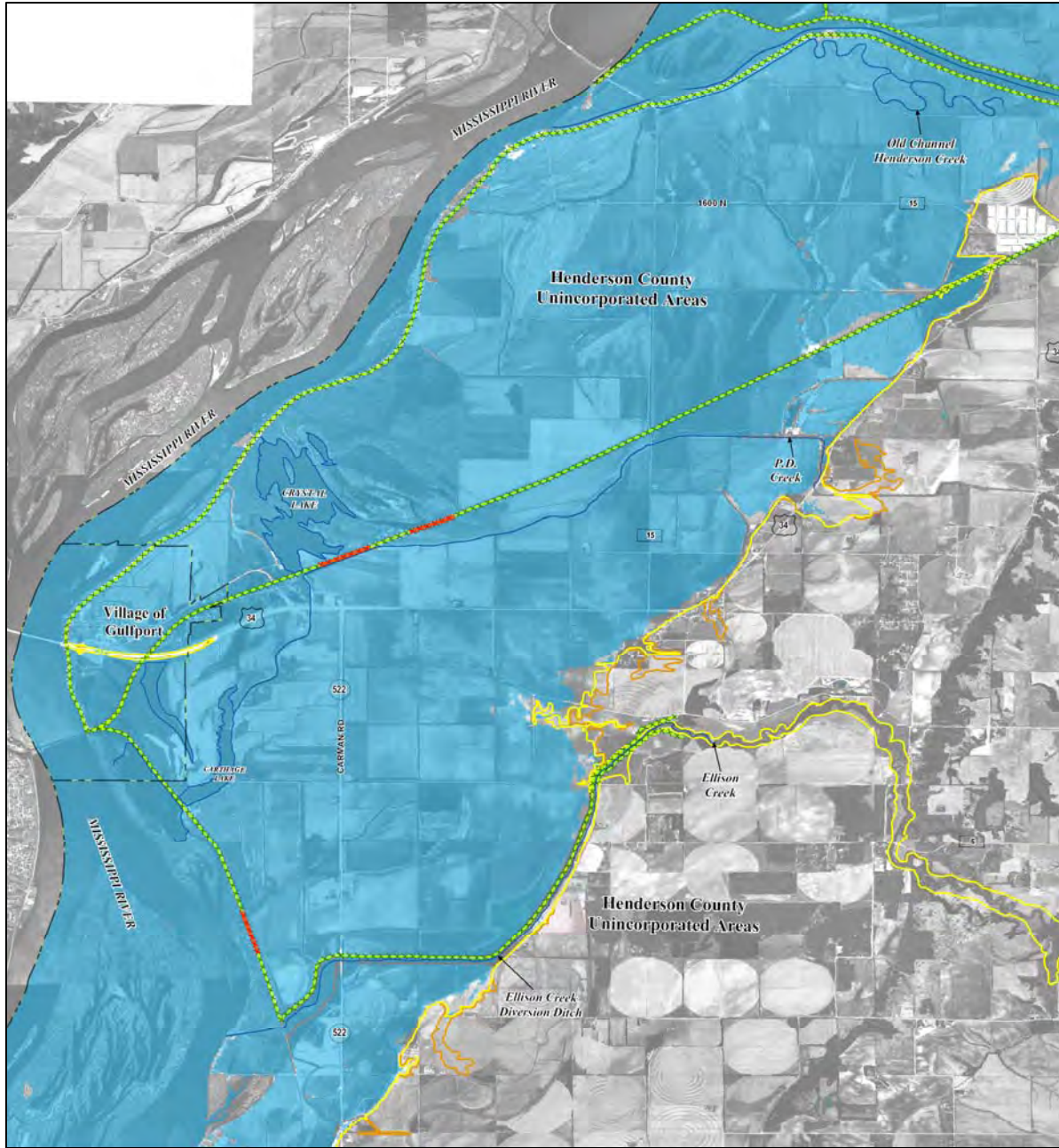


Figure 10. Area of Illinois inundated by floodwaters as interpreted from satellite imagery collected on June 23, 2008. The image was taken after the levee breaches shown on the map resulting in extensive flooding behind the levees in Henderson County.

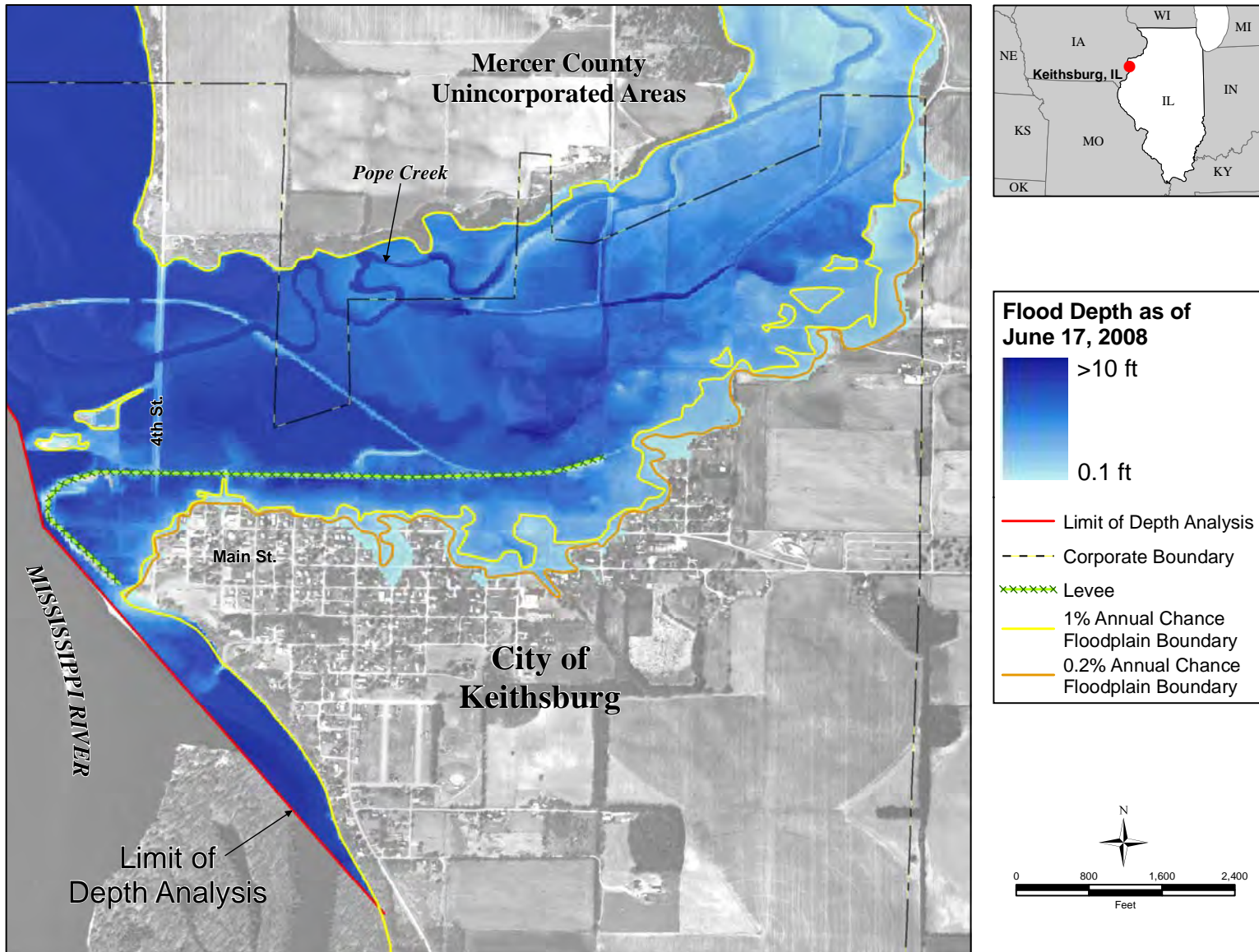


Figure 11. Estimated flood depths near Keithsburg at peak of flooding on June 17, 2008. The boundaries for the 1% and 0.2% annual-chance floods, according to the Mercer County preliminary DFIRM, are included to evaluate the extent of the 2008 flood.

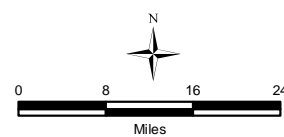
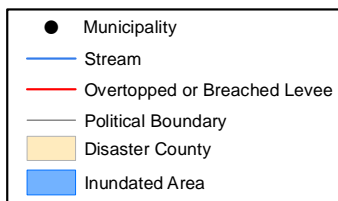
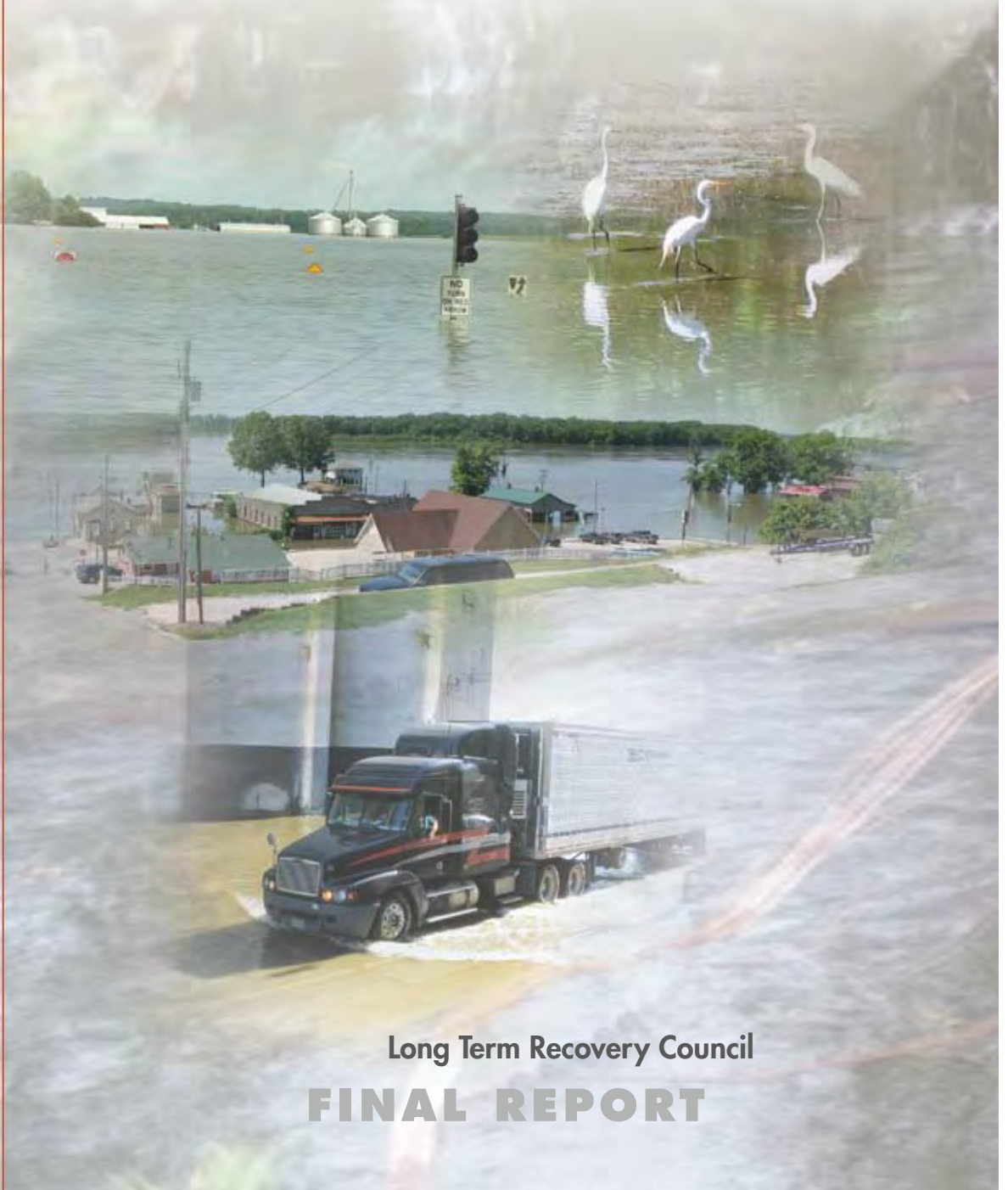


Figure 12. Areas of Illinois and Indiana inundated by floodwaters of the Embarras River and Wabash River as interpreted from satellite imagery collected on June 11, 2008



## Chapter II

### Description of Flood Recovery Assistance Provided Following the Flood



Long Term Recovery Council  
**FINAL REPORT**

## CHAPTER II – DESCRIPTION OF FLOOD RECOVERY ASSISTANCE PROVIDED FOLLOWING THE FLOOD

### **Timeline of Important Events**

*(Provided by Illinois Emergency Management Agency Director Valasquez on June 17, 2009)*

- 01 June 2008
  - Severe storms and heavy rainfall throughout state
  - IEMA monitors situation and begins strategic planning
- 09 June 2008
  - IEMA begins facilitation of local resource requests
- 10 June 2008
  - Governor declares Clark, Coles, Crawford, Cumberland, Jasper, and Lawrence counties state disaster areas

*“On June 11, Illinois Governor Rod Blagojevich deemed Clark, Coles, Crawford, Cumberland, Jasper and Lawrence counties as disaster areas. Levee breaks on June 10 flooded portions of Lawrence County near Lawrenceville, inundating a campsite and forcing the evacuations of 200 homes”.<sup>(1)</sup>*
- 12 June 2008
  - Operations begin in the State Emergency Operations Center – Springfield, Illinois
- 13 June 2008
  - Governor requests Direct Federal Assistance
  - Illinois National Guard deploys in support of flood operations
- 14 June 2008
  - Governor preemptively declares Adams, Calhoun, Douglas, Hancock, Henderson, Lake, Mercer, Pike, and Rock Island counties state disaster areas

*“On June 14 many communities located along the Mississippi River in West Central Illinois were notified by the National Weather Service that crests along the river would exceed the record crests of 1993. On the early morning of June 14, the town of Oquawka, Illinois was evacuated, due to a breach in a levee along the swollen Iowa River. The city council believed this would affect the flood waters in the already flooding Mississippi River. The same day two levees broke near the town of Keithsburg, Illinois, flooding most of the town”.<sup>(2)</sup>*
- 15 June 2008
  - Unified Area Command (UAC) established in Quincy, Illinois

*“On the morning of June 15, a levee along the Mississippi River in the town of Gulfport failed, flooding most of the town”.<sup>(2)</sup>*

- 16 June 2008
  - Governor declares Winnebago and Jersey counties state disaster areas
- 17 June 2008
  - Governor declares Knox and Madison counties state disaster areas
- 18 June 2008
  - Unified Area Command established in Alton, Illinois

*“Two more levees were breached by flood waters in western Illinois on June 18. The breaches flooded farmland near Meyer and forced an evacuation of the town”.<sup>(3)</sup>*

***Midwest Flooding Excerpts from Congressional Record<sup>(4)</sup>***

*Mr. DURBIN. Mr. President, this Father's Day weekend I celebrated by buying a dehumidifier. I live in the Midwest, and we have had a lot of rain, but I am lucky because my problems with a damp basement are minor--very minor--in comparison to what people all across the Midwest are facing. We have seen this before.*

*Tens of thousands of our neighbors in the Midwest have suffered staggering losses and need help and our Government needs to be there, as promised. In my State of Illinois, the same floods that have devastated our northern neighbors are now heading our way. We are in a race against time and nature.*

*By Wednesday of this week, at least in the Quincy area of the Mississippi River, we expect the Mississippi River to reach its crest. It is the mightiest river in North America. It is a beautiful river and a big part of America's history but, boy, when the rains start falling and all those rivers start feeding into it, the Mississippi can become almost uncontrollable.*

*There are fears that the flooding along the Mississippi in Illinois could reach historic levels that we experienced during the great flood of 1993.*

*Floods in our part of the world are a gradual, building thing that seem like they will never go away. Thousands were forced to evacuate their homes, as hundreds of levees failed up and down the Mississippi River. The economic damage exceeded \$15 billion.*

*The experts told us after that flood that it was a 500-year flood event. So we thought we would be able to brag about that for the rest of our lives, and generations to come will point back to 1993. Well, here we are 15 years later, and we seem to be on the verge of another similar disaster.*

*Last Friday, when the Senate adjourned, I went back to my home State and drove over to Quincy on the Central Illinois Expressway and met with Mayor John Spring and then went down to Grafton, IL, and met with Mayor Richard Mosby.*

*In those cities and towns up and down the Mississippi River, people are filling sandbags as fast as they can do it. They are fortifying existing levees and creating levees to protect businesses and homes and valuable infrastructure.*

*I commend all the residents, volunteers, emergency workers, and the more than 400 members of the Illinois National Guard, who are working to brace our State for these floodwaters. Many people are working around the clock.*

*It is not unusual, of course, to see the great efforts of the Red Cross. They are always there trying to help people along, providing a sandwich and a bottle of water to the folks who need it when they are working. Also, other volunteers, including folks at a age where they could not pitch in and fill a sandbag, but they were making sandwiches and cookies to bring to the volunteers. It is that kind of a community outpouring that means so much.*

*The official Government agencies were sure there doing their part, including FEMA and our Illinois counterpart, coordinating the disaster response, along with the Army Corps of Engineers.*

*Over the weekend, two levees in our State--in the towns of Carman and Keithsburg--failed. Hundreds of residents in those towns have left their homes. Another levee broke last week in the town of Lawrenceville, on the east side of the State, and residents are stranded there without drinkable water.*

*At the urging of Senator Obama and myself, Governor Blagojevich wrote to President Bush and asked him to declare a number of Mississippi River counties Federal disaster areas. Quincy is preparing for the worst. The river is expected to crest at 32 feet. One of the main concerns there is the water intake plants that provide water for the region. If it goes down, it may take months to restore it. That will be a hardship on a lot of people we hope to avoid.*

*I was with GEN Bill Enyart, head of the Illinois National Guard, Friday night. I said: Bill, I hope that as a special project the Illinois National Guard will join with Mayor John Spring to try to protect that waterworks. It is important. Bill answered the call immediately and called Mayor John Spring and sent 100 members of the Air Force National Guard there to start sandbagging around the water treatment plant, trying to save it before the river crests on Wednesday. All those volunteers and emergency workers--even State prisoners released from the local prisons and correction camps--are working side by side to fill sandbags.*

- 19 June 2008
  - Governor declares Edgar and St. Clair counties state disaster areas
- 22 June 2008
  - Governor declares Monroe, Randolph, and Whiteside counties state disaster areas

- 25 June 2008
  - Federal Disaster Declaration issued
- 30 June 2008
  - Joint Field Office (JFO) established (Springfield, Illinois)
- 01 July 2008
  - UAC North and South cease response operations; Disaster Recovery Centers (DRC) established throughout state
- 02 July 2008
  - IEMA coordinates short-term recovery in Quincy, Rock Island, and Lawrenceville

***SPRINGFIELD, Ill. July 2008*** <sup>(5)</sup> -- *More than \$7.2 million in federal disaster assistance grants and loans has been approved so far by the Federal Emergency Management Agency and the U.S. Small Business Administration (SBA) for Illinois residents who suffered damages and losses during the severe storms and flooding that began June 1.*

*To date, 2,548 homeowners and renters from the 18 designated counties have applied for disaster assistance. \$5,061,565 in grants has been approved for Illinois applicants. \$4,647,394 in housing assistance to cover temporary rental assistance, home repairs and replacement. \$414,171 in Other Needs Assistance to cover personal property losses, medical, dental, funeral, transportation or other serious disaster-related expenses not covered by insurance. \$2,203,800 in U.S. Small Business Administration disaster loans has been approved for 45 disaster assistance applicants. 1,943 disaster loan applications have been issued, 1,492 to residents and 451 to business owners. More than 1,300 Illinois residents have visited FEMA's Disaster Recovery Centers (DRC) for face-to-face meetings with disaster recovery specialists.*

*FEMA and the Illinois Emergency Management Agency currently have six DRCs open throughout the state to assist applicants with their disaster recovery applications.*

*The DRCs are staffed with disaster recovery specialists from federal, state and other agencies, and are open from 9 a.m. to 7 p.m. , Monday through Saturday. Their locations are:*

*Adams County (open until 4 p.m. , Aug. 2), Illinois Veteran's Home, 1707 N. 12th Street, Quincy*  
*Lawrence County (open until 4 p.m. , Aug. 1), Parkview Junior High School, 1802 Cedar Street, Lawrenceville*

*Mercer County (open until 7 p.m. , July 26), Keithsburg City Building, 302 S. 14th Street, Keithsburg*

*Rock Island (open until 7 p.m. , July 26), Milan Municipal Building, 405 East 1st Street, Milan*  
*Warren County (open until 7 p.m. , July 26), Huff Athletic Building, Monmouth College, 700 E. Broadway, Monmouth*

*Winnebago County (open until 4 p.m. , Aug. 8), Michelsen's Office Furniture Building, 8020 N. 2nd Street, Machesney Park.*

*Anyone who has applied for disaster assistance and has received a disaster-loan application*

*from the SBA is urged to complete and return it as soon as possible. If SBA determines that a homeowner or renter is ineligible for a loan, that applicant automatically will be referred to FEMA for other possible grant assistance.*

*The counties designated eligible for Individual Assistance are: Adams, Calhoun, Clark, Coles, Crawford, Cumberland, Douglas, Edgar, Hancock, Henderson, Jasper, Jersey, Lake, Lawrence, Mercer, Rock Island, Whiteside and Winnebago. Individual Assistance can include grants to help pay for temporary housing, essential home repairs and other necessary disaster-related expenses not covered by insurance.*

*FEMA coordinates the federal government's role in preparing for, preventing, mitigating the effects of, responding to, and recovering from all domestic disasters, whether natural or man-made, including acts of terror."*

***Levee cuts spur drainage. Rain may impact U.S. 34 opening.*** <sup>(6)</sup>

***GULFPORT, Ill.*** – *"After much consultation and discussion, Henderson County Drainage District No. 1 commissioners decided cutting holes in the levee is the best option to clear the floodwaters.*

*"We sat down as commissioners with people from the (U.S. Army Corps of Engineers) Corps and the county board and just decided that would probably be the cheapest and fastest way to remove the water from the district," said Henderson County Drainage District No. 1 commissioner Russell Torrance. This will save money on pumping costs and speed up the drainage by at least a month.*

*Rainfall farther north is expected to raise the river level later this week, but not high enough to worry the drainage district commissioners.*

*The predicted rise, though, has the potential to slow efforts by the Illinois Department of Transportation to get water off U.S. 34. "With the rains that happened in (northern) Iowa last night ... that obviously changed the water level forecasts on the river, so every rain effects it a little bit," Illinois DOT District 4 operations engineer Shane Larson said Tuesday. "We're watching that real closely." He said if the water levels increase nearly a foot, it will affect the work his crew can do. "There's more pavement visible today than there was yesterday, so we continue to clean pavement as it reveals itself, and we'll keep doing that until we get it open," Larson said. He said as the water recedes, there has yet to be an indication the road has significant problems. Larson said if the water continues to drop from the road at the same rate it has been, he expects the road could open by early next week."*

***Draining Henderson County.*** <sup>(7)</sup>

*"Areas of Henderson County remain under water weeks after a levee breach inundated acres of farmland and overtook Hwy. 34 and some county roads during the worst of the flooding that occurred in west central Illinois in June. The flood forced the closing of the Great River Bridge, which spans the watery state line that separates Iowa and Illinois.*

*The levees are being breached again this month — this time on purpose, to provide channels*

*through which the standing water can flow back into the adjacent Mississippi. On Wednesday morning, Mike Pieper, from Wever-based Pieper Excavating, Inc., said his company was cutting slots in Henderson county levees to help the water drop naturally. He also noted this method will enable the murky waters to drain more quickly.”*

- 11 July 2008
  - Disaster Assistance briefings held throughout the state

***Businesses tread water during U.S. 34 closure <sup>(8)</sup>***

*“For business owners in the Burlington area, U.S. 34 can’t open soon enough, but despite cuts in the levee at Gulfport, it still could be several days before the highway dries out enough to begin repairs.*

*“You can absorb a couple days if you have to, but every day that it goes on, though, it makes -- you know, a decline in sales, added expense -- it makes cash-flow even tighter,” said Jason Hutcheson, executive director of Grow Greater Burlington Inc.*

*Hutcheson said from talking to area owners, nearly all of the 600-plus businesses have been impacted by the highway closure, whether it be from loss of revenue or an increase in shipping costs. “Some businesses have commented that 30 percent of their traffic comes from Illinois,” Hutcheson said. “It’s actually been somewhat surprising how much traffic we get from Illinois.”*

*Because of the impact, businesses, as well as individuals, have the opportunity to apply for assistance through the Federal Emergency Management Agency and the Small Business Administration. The assistance is for both those water-damaged businesses and those with only revenue losses.*

*“The major problems we faced were at the beginning when (Interstate) 380 and I-80 were both down,” said Bob Sarver, general manager of Wal-Mart Warehouse. “Of course, we’d love for 34 to be back open, but we’ve managed to work around that, too.” Sarver said the transportation team has been able to complete all its deliveries throughout the flooding, though, in some cases it has been running extra miles.*

*While I-380 and I-80 were closed for a matter of days, U.S. 34 has been down for about three weeks, and its chances of opening depend solely on the rising Mississippi River.”*

- 24 July 2008
  - Governor declares Greene County state disaster area
- 21 August 2008
  - Governor creates Long Term Recovery Council (LTRC)

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CHAPTER II – DESCRIPTION OF FLOOD RECOVERY ASSISTANCE PROVIDED FOLLOWING THE FLOOD

Severe storms throughout the Midwest in 2008 produced heavy rains resulting in widespread flooding along the Wabash River in southeastern Illinois, the Fox River in northeastern Illinois, the Illinois River in northern Illinois, and the Mississippi River along western Illinois. Major flooding reached record stages along more than 280 miles of the Mississippi River. State and federal agencies reached out to provide assistance to impacted areas. The following tables present a summary of government resources expended for response and recovery operations from both state (Table 8) and federal agencies (Table 9). The following agencies have provided information for this report. According to reports received, not all counties received funding due to eligibility requirements or level of damage. Therefore, data is not available for all counties.

**Table 8: Flood Response Expenditures by State Agencies**  
(Data provided by IEMA June 19, 2009)

<b>Agency</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>Total</b>
Department of Central Management Services	\$ 22,139.54	\$ 34,512.48	\$ 56,652.02
Department of Human Services	5,182.98	10,861.47	16,044.45
Department of Natural Resources	254,827.21	103,532.68	358,359.89
Department of Corrections	6,113.10	101,555.01	107,668.11
Department of Transportation	32,912.18	209,270.05	242,182.23
Department of Public Health	393,176.83	237,036.22	630,213.05
Emergency Management Agency	2,007,436.56	1,001,258.44	3,008,695.00
Environmental Protection Agency	0.00	0.00	0.00
Law Enforcement Alarm System	0.00	159,217.39	159,217.39
Medical Emergency Response Team	0.00	6,799.67	6,799.67
Department of Military Affairs	1,924,444.03	713,458.76	2,637,902.79
State Police	12,231.53	4,169.18	16,400.71
<b>Totals</b>	<b>\$4,658,463.96</b>	<b>\$2,581,671.35</b>	<b>\$7,240,135.31<sup>(1)</sup></b>

(1) Data and information provided by IEMA, represents expenditures by state agency for flood response.

**Table 9: Flood Response Expenditures by Federal Agencies**

	<b>Total Cost</b>	<b># Affected</b>
Federal Emergency Management Agency		
Individual Assistance	\$ 9,925,822.39	1752 individuals
Public Assistance	\$ 48,171,753.90	368 entities
U.S. Fish & Wildlife Service	\$ 4,789,000.00	5 refuges
FCIC Crop Insurance Payments	\$ 155,388,301.00	3,411,648 Acres
Health and Human Services		
Social Service Block Grant	\$ 5,319,455.49	
Illinois Department of Transportation	\$ 14,189,062.00	71 projects
IEMA Buyout Requests	\$ 38,033,019.00	966 properties
Small Business Administration		
Home	\$ 10,020,100.00	216 owners
Business	\$ 3,572,700.00	24 business owners
Natural Resources Conservation Service		
Emergency Watershed Protection Program	\$ 1,220,500.00	13 projects
Emergency Watershed Protection		
Floodplain Easements	\$ 7,173,595.00	9 projects
U.S. Army Corps of Engineers	\$ 80,023,804.00	
<b>Total of All Agency Assistance</b>	<b>\$377,827,112.78</b>	

## Agricultural Losses

Table 10 includes data from the Federal Crop Insurance Corporation (FCIC). The indemnity payments displayed represent total payouts to agricultural producers and lists the total number of affected acres in 2008 for all crop and all policy types. Policy types include Yield-based Insurance Coverage and Revenue Insurance Plans. Detailed descriptions of these plans are available on the FCIC website: (<http://www.rma.usda.gov/FCIC/>). It should be noted that these are totals for 2008. Not all of the payments included in Table 10 are a result of the June 2008 flood event.

**Table 10: Federal Crop Insurance Corporation Crop Insurance Payments and Affected Acres**

(Data provided by the USDA Risk Management Office July 14, 2009)

<b>Declared County</b>	<b>Total Affected Acreage</b>	<b>Total Indemnity Payments</b>
Adams	221,511	\$ 17,783,432.00
Calhoun	28,554	\$ 2,466,150.00
Clark	130,776	\$ 4,304,578.00
Coles	152,339	\$ 6,710,810.00
Crawford	131,161	\$ 3,339,164.00
Cumberland	86,350	\$ 2,681,825.00
Douglas	145,659	\$ 8,871,740.00
Edgar	204,226	\$ 11,502,412.00
Greene	141,158	\$ 8,063,378.00
Hancock	249,785	\$ 9,553,730.00
Henderson	124,824	\$ 5,832,936.00
Jasper	151,124	\$ 5,606,048.00
Jersey	78,558	\$ 2,441,327.00
Lake	15,590	\$ 328,680.00
Lawrence	140,223	\$ 11,029,602.00
Madison	152,099	\$ 3,775,858.00
Mercer	211,410	\$ 8,322,943.00
Monroe	95,960	\$ 2,392,466.00
Pike	181,136	\$ 13,345,972.00
Randolph	109,259	\$ 2,795,365.00
Rock Island	96,584	\$ 5,735,803.00
Scott	63,560	\$ 3,473,066.00
St. Clair	133,706	\$ 2,456,699.00
Whiteside	249,443	\$ 7,052,930.00
Winnebago	116,653	\$ 5,521,387.00
<b>Total</b>	<b>3,411,648</b>	<b>\$ 155,388,301.00</b>

## Transportation Losses

In response to serious flooding throughout Illinois in 2008, the Illinois Department of Transportation (IDOT) provided just over \$14 million in the FY 2009 Highway Improvement Program to address repair needs not handled by the internal workforce or by stand-alone projects through the regular highway improvement program as they were identified throughout the fiscal year. Table 11 provides a breakout by county of expenditures. The type of work varies from generic “flood repair” to roadway resurfacing and scour repair on bridges. Nearly \$12.5 million has been obligated.

**Table 11: Flooding Impacts on Transportation**

(Data provided by IDOT August 4, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b># Road Repair Projects</b>	<b>Project Cost</b>
Adams	5	\$ 1,556,000.00 (est)
Calhoun	3	\$ 114,754.00
Clark	3	\$ 83,156.00
Crawford	3	\$ 140,736.00
Cumberland	4	\$ 98,520.00
Hancock	2	\$ 1,100,000.00
Henderson	3	\$ 573,730.00
Jasper	6	\$ 51,003.00
Lawrence	3	\$ 145,784.00
Madison	5	\$ 6,681,151.00
Mercer	3	\$ 249,540.00
Monroe	1	\$ 155,476.00
Rock Island	3	\$ 108,885.00
Other Entities	29 <sup>(2)</sup>	\$ 3,130,327.00
<b>Total</b>		<b>\$ 14,189,062 <sup>(3)</sup></b>

(1) Based on the date the information was received, the following counties had not received funding for road repair: Coles, Douglas, Edgar, Greene, Jersey, Lake, Pike, Randolph, Scott, St.Clair, Whiteside, and Winnebago Counties.

(2) Represents different repair projects at various locations.

(3) Total figure includes estimated highway repair costs in Adams County.

## Transportation Losses

The flood of June 2008 disrupted transportation systems in the affected counties. According to IDOT, traffic impact costs including adverse travel cost, detour maintenance and signing totaled \$6,078,861. A breakdown by county follows.

**Table 12: Illinois Department of Transportation Reported  
Transportation Losses by County**  
(Information provided by IDOT May 21 and June 2, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b>Traffic Impact Cost</b>
Adams	\$ 120,840.00
Hancock	\$ 509,950.00
Henderson	\$ 4,878,490.00 <sup>(2)</sup>
Jersey	\$ 48,370.00
Mercer	\$ 58,500.00
Pike	\$ 402,725.00
Randolph	\$ 38,606.00
Other Entities	\$ 21,380.00 <sup>(3)</sup>
<b>Total</b>	<b>\$ 6,078,861.00</b>

Notes:

- (1) Based on the dates the information was received, there were no adverse travel impacts in Calhoun, Clark, Coles, Crawford, Cumberland, Douglas, Edgar, Greene, Jasper, Lake, Lawrence, Madison, Monroe, Rock Island, Scott, St. Clair, Whiteside or Winnebago.
- (2) The traffic impact costs in Henderson County are high as a result of two road detours of 86 and 141 miles that were each in place in excess of 30 days.
- (3) "Other Entities" refers to Clinton County and St. Charles County, MO which were not part of the disaster declaration but incurred traffic impact costs of \$8,305 and \$13,075 respectively as a result of the flood.

## Damage Assessments based on IEMA Buyout Requests

Eight of the 25 federally declared counties have submitted buyout requests totaling \$38,033,019. These requests proposed to buy out 47 commercial structures, acquire 525 residential structures, elevate 377 residential structures, and purchase 17 vacant lots. Specific counties and numbers can be reviewed in Table 13. This data serves as a proxy of the amount of federal assistance needed to pay property owners for the purchase of damaged property or the cost to elevate existing properties to prevent future losses.

**Table 13: Illinois Emergency Management Agency  
Buyout Requests After the 2008 Flood**  
(Data compiled by IEMA August 26, 2008; provided May 7, 2009<sup>1)</sup>)

		Commercial	Acquisition Residential	Elevate Residential	Vacant
	\$ Amount	# Structures	#Structures	#Structures	Lots
Adams	\$ 3,523,068.00	2	50	100	6
Calhoun	\$ 2,413,062.00	1	16		
Douglas	\$ 793,400.00		12		1
Hancock	\$ 1,669,825.00	5	33		
Henderson	\$ 9,453,180.00	18	163		9
Jersey	\$ 2,051,664.00	5	10	2	
Lake	\$ 5,382,765.00		21	4	
Mercer	\$ 2,921,925.00	16	35	1	1
Winnebago	\$ 11,493,955.00		185	270	
<b>Totals</b>	<b>\$ 39,702,844.00</b>	<b>47</b>	<b>525</b>	<b>377</b>	<b>17</b>

- (1) The following counties were not eligible for IEMA Buyout Assistance: Clark, Coles, Crawford, Cumberland, Edgar, Greene, Jasper, Lawrence, Madison, Monroe, Pike, Randolph, Rock Island, Scott, St.Clair, and Whiteside.

***Description of Flood Recovery Assistance Provided Following the Flood***

**Individual Assistance**

Individual Assistance (IA) encompasses disaster assistance to individuals and households directly impacted by a disaster. Assistance to disaster victims through the IA Program can include temporary housing assistance, housing repair assistance, personal property replacement, medical expenses, funeral assistance, and other expenses approved by law directly related to individual disaster loss.

FEMA has provided over \$9,000,000 to individuals affected by the FEMA-1771-DR flood declaration of 2008. One thousand seven-hundred fifty-two individuals received \$9,925,822.39 through the FEMA IA program.

**Table 14: Assistance Provided by the Federal Emergency Management Agency Individual Assistance Program**  
(Data provided by FEMA May 6, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b>Individual Assistance</b>	<b>Number of People Served</b>
Adams	\$ 302,795.55	57
Calhoun	\$ 77,257.35	27
Clark	\$ 210,627.47	53
Coles	\$ 444,843.82	83
Crawford	\$ 211,947.01	28
Cumberland	\$ 14,557.26	6
Douglas	\$ 249,478.59	76
Edgar	\$ 402,175.58	142
Hancock	\$ 760,865.46	95
Henderson	\$2,364,755.36	225
Jasper	\$ 332,236.23	33
Jersey	\$ 78,923.96	24
Lake	\$ 98,837.26	56
Lawrence	\$1,497,010.41	121
Mercer	\$ 507,025.22	78
Rock Island	\$ 756,371.97	269
Whiteside	\$ 14,514.31	5
Winnebago	\$1,601,599.58	374
<b>Totals</b>	<b>\$9,925,822.39</b>	<b>1752</b>

(1) The following counties did not receive FEMA Individual Assistance: Greene, Madison, Monroe, Pike, Randolph, Scott and St. Clair.

## Public Assistance

Through the Public Assistance (PA) Program, FEMA provides supplemental federal disaster grant assistance to units of local government or certain private non-profits for debris removal, emergency protective measures, and the repair, replacement or restoration of damaged facilities that are publicly owned or owned by private non-profit organizations.

Twenty-four of the 25 declared counties were eligible for public assistance (Whiteside County was not eligible for assistance). There were 368 grantees for the \$48,171,753.90 devoted to public assistance. An additional amount of \$11,693,502 was contributed by other sources to provide the 25% match required for all FEMA grants. These sources of matching funds can come from local, state, or private funds to complete these public assistance projects.

**Table 15: Assistance Provided by the Federal Emergency Management Agency Public Assistance Program**  
(Data provided by IEMA May 14, 2009)

<b>Declared County</b>	<b>Federal Share Public Assistance</b>	<b>Project Cost Public Assistance</b>	<b># Grantees</b>
Adams	\$ 5,422,793.48	\$ 6,779,890.96	29
Calhoun	\$ 1,405,901.95	\$ 1,852,456.64	5
Clark	\$ 1,274,912.66	\$ 1,618,467.15	22
Coles	\$ 594,990.25	\$ 789,303.34	16
Crawford	\$ 329,671.08	\$ 433,304.14	16
Cumberland	\$ 276,905.46	\$ 368,934.73	11
Douglas	\$ 686,402.13	\$ 932,355.47	11
Edgar	\$ 478,564.85	\$ 631,174.73	14
Greene	\$ 375,113.09	\$ 448,903.07	8
Hancock	\$ 2,693,784.67	\$ 3,483,369.20	15
Henderson	\$ 6,106,262.81	\$ 7,326,416.78	11
Jasper	\$ 1,488,855.92	\$ 1,980,000.87	18
Jersey	\$ 390,274.33	\$ 489,467.01	14
Lake	\$ 2,611,346.19	\$ 3,439,131.85	21
Lawrence	\$ 333,776.49	\$ 407,710.64	15
Madison	\$ 2,143,581.56	\$ 2,775,555.81	9
Mercer	\$ 3,225,899.42	\$ 4,213,191.34	20
Monroe	\$ 158,283.11	\$ 204,320.82	14
Pike	\$ 1,628,509.17	\$ 2,242,088.32	33
Randolph	\$ 580,524.76	\$ 738,541.76	8
Rock Island	\$ 1,889,770.24	\$ 2,440,151.93	28
Scott	\$ 266,400.92	\$ 322,352.06	5
St. Clair	\$ 583,269.77	\$ 760,820.71	4
Winnebago	\$ 798,017.98	\$ 985,672.50	11
Other Entities <sup>(1)</sup>	\$ 12,427,941.61	\$ 14,201,673.88	10
<b>Totals</b>	<b>\$ 48,171,753.90</b>	<b>\$ 59,865,255.71</b>	<b>368</b>

(1) Other Entities include Health Departments, Levee Districts, and other taxing authorities.



## **National Flood Insurance Program (NFIP)**

Flood insurance data through the NFIP is omitted from this chapter. Detailed insurance claims data is subject to privacy act and is largely unavailable. The only data available on a county level is the total sum of all claim payments made between 1978 and April 2009. Using these data as an indication of the relative severity of historic flood problems amongst the counties affected by the June 2008 floods is problematic for several reasons. First, the total sum of payments data between 1978 and April 2009 is not adjusted for inflation. This non-adjusted data under-represents the events which occurred at the beginning of the time period. If payouts were adjusted for inflation it is possible that the data would paint a different picture about the relative impacts of flooding on the various counties. Second, flood insurance claim payouts are dependent upon a property owner having a flood insurance policy in force. Since flood insurance is not required when individuals own their property outright, insurance participation rates vary across the counties. It is possible that less payout was made in a county that was more severely impacted by a historic flood event than other counties which were less severely impacted but had higher insurance participation rates. Finally, because there are different levels of flood insurance coverage, flood insurance will not accurately reflect the severity of damage that occurred (because of different levels of insurance coverage). Examples include damages incurred that are not covered under a standard flood insurance policy or a property owner being under insured.

## Small Business Administration

The Small Business Administration (SBA) Disaster Loans are made available to FEMA registered disaster victims for both personal and business losses. Home disaster loans can be made to homeowners and renters who have damages that were uninsured. These loans can be made for the repair or replacement of both real estate and personal property, subject to limits and underwriting criteria. Business loans are also available to disaster-affected businesses for the repair or replacement of real estate, inventories, equipment and other physical losses. Businesses in disaster areas may also be eligible for Economic Injury Disaster Loans, subject to economic injury as determined by the SBA, program limits, and minus business interruption insurance received by the business.

The SBA has provided a total of \$13,592,800 in assistance through loans to individuals and businesses affected by the June 2008 flooding. Table 16 displays the number and dollar amounts of loans provided for homes and businesses in each of the counties.

**Table 16: Assistance Provided by the Small Business Association to Homes and Businesses**  
(Data provided by SBA June 3, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b># Home Loans Approved</b>	<b>Dollars Approved</b>	<b># Business Loans Approved</b>	<b>Dollars Approved</b>	<b>Total Dollars</b>
Adams	9	\$ 280,700	2	\$ 159,200	\$ 439,900
Calhoun	1	\$ 20,800	0	\$ -	\$ 20,800
Clark	4	\$ 97,800	0	\$ -	\$ 97,800
Coles	7	\$ 325,100	2	\$ 62,300	\$ 387,400
Crawford	6	\$ 207,900	0	\$ -	\$ 207,900
Cumberland	1	\$ 8,800	0	\$ -	\$ 8,800
Douglas	8	\$ 181,200	0	\$ -	\$ 181,200
Edgar	17	\$ 300,200	1	\$ 11,400	\$ 311,600
Hancock	13	\$ 710,300	1	\$ 59,500	\$ 769,800
Henderson	37	\$ 3,251,100	4	\$ 723,000	\$ 3,974,100
Jasper	4	\$ 38,800	0	\$ -	\$ 38,800
Jersey	1	\$ 20,800	3	\$ 960,800	\$ 981,600
Lake	11	\$ 204,000	1	\$ 33,900	\$ 237,900
Lawrence	16	\$ 1,521,100	3	\$ 1,095,400	\$ 2,616,500
Mercer	9	\$ 184,800	0	\$ -	\$ 184,800
Rock Island	19	\$ 434,300	2	\$ 27,800	\$ 462,100
Whiteside	1	\$ 14,000	0	\$ -	\$ 14,000
Winnebago	52	\$ 2,218,400	5	\$ 439,400	\$ 2,657,800
<b>Totals</b>	<b>216</b>	<b>\$ 10,020,100</b>	<b>24</b>	<b>\$ 3,572,700</b>	<b>\$ 13,592,800</b>

(1) The following counties did not receive SBA funding: Greene, Madison, Monroe, Pike, Randolph, Scott or St. Clair.

## Health and Humans Service’s Social Services Block Grant

The U.S. Department of Health and Human Services has provided assistance for those individuals and communities affected by the June 2008 flood in the form of grants through the Social Services Block Grant Program (SSBG). This fund will support a variety of activities including: response assistance and technical support for emerging health threats, counseling and other mental health substance abuse services, and increased support for needed social services. These funds were distributed to counties in June of 2009 to cover unmet social and health needs for individuals and groups affected by the 2008 flood. These funds were provided to counties based on submissions of requests for use of these funds to the Illinois Department of Human Services. In total, the SSBG has provided \$5,319,455 to the affected counties. Table 17 provides a breakdown by county for the cost of SSBG projects.

**Table 17: Social Services Block Grant Program  
Project Expenditures**

(Data provided by the Bureau of Title XX Social Services July 7, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b>Project Cost</b>
Adams	\$ 238,315.62
Calhoun	\$ 11,288.63
Clark	\$ 22,159.17
Coles	\$ 34,702.10
Crawford	\$ 11,706.73
Cumberland	\$ 2,508.59
Douglas	\$ 31,775.42
Edgar	\$ 59,369.86
Hancock	\$ 397,192.70
Henderson	\$ 940,719.55
Jasper	\$ 13,797.22
Jersey	\$ 10,034.34
Lake	\$ 23,413.46
Lawrence	\$ 505,898.07
Mercer	\$ 326,116.11
Rock Island	\$1,124,682.49
Whiteside	\$ 2,090.49
Winnebago	\$1,563,684.94
<b>Totals</b>	<b>\$5,319,455.49</b>

(1) The following counties did not receive SSBG funding: Greene, Madison, Monroe, Pike, Randolph, Scott, and St. Clair Counties.

## US Army Corps of Engineers

The U.S. Army Corps of Engineers made several repairs to levees as a result of the June 2008 flood. In total, levee repairs cost \$75,979,958. Table 18 provides cost amounts for levee repairs in each county.

**Table 18: U.S. Army Corps of Engineers Levee Repair Cost**  
(Data provided by USACE May 19 and June 17, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b>Cost</b>
Adams	\$ 18,900,000
Calhoun	\$ 700,000
Crawford	\$ 699,958
Hancock	\$ 9,400,000
Henderson	\$ 14,800,000
Jasper	\$ 1,595,441
Lawrence	\$ 2,448,405
Madison	\$ 500,000
Mercer	\$ 200,000
Monroe	\$ 30,000
Pike	\$ 3,800,000
Randolph	\$ 2,900,000
St. Clair	\$ 700,000
Other Entities <sup>(2)</sup>	\$ 23,350,000
<b>TOTAL</b>	<b>\$80,023,804</b>

- (1) The following counties did not receive funding or the requests were still in process at the time of requests Clark, Coles, Cumberland, Douglas, Edgar, Greene, Jersey, Lake, Rock Island, Scott, Whiteside, and Winnebago.
- (2) "Other Entities" refers to Alexander, Jackson, and Union counties which were not included in the FEMA disaster declaration. USACE estimates that repairs costing \$2,750,000, \$19,600,000 and \$900,000 respectively were made to levees in those counties. Repairs in Fayette County were estimated at \$100,000. However, these repairs were never initiated due to a lack of requisite matching funds.

## U.S. Fish and Wildlife

As a result of the flood event of June 2008 the U.S. Fish and Wildlife Service (USFWS) made several repairs to various National Wildlife Refuges, wetland districts, and hatcheries. Table 19 shows the expenditures made by the USFWS at Region 3 stations as a result of the June 2008 flood. Region 3 includes Minnesota, Iowa, Missouri, Illinois, Wisconsin, Michigan, Indiana and Ohio. This table provides data on additional recovery assistance provided to business and local government entities in Illinois. Highlighted Refuges are within the specific project study area.

**Table 19: U.S. Fish and Wildlife Service  
Region 3 Repair Expenditures**  
(Data provided by USFWS Region 3 Office June 19, 2009<sup>(1)</sup>)

USFWS Region 3 Station	Total
Big Oaks	\$227,750
Crab Orchard	\$1,675,000
Cypress Creek	\$777,000
Winona District	\$575,000
La Crosse District	\$415,000
McGregor District	\$500,000
Savanna District	\$1,110,000
Illinois River Refuges	\$755,000
Middle Mississippi River Refuge	\$109,000
Mingo Refuge	\$1,295,000
Squaw Creek NWR	\$115,000
Muscatatuck Refuge	\$159,000
Patoka River Refuge	\$189,500
Great River NWR	\$640,000
Two Rivers Refuge	\$1,095,000
Port Louisa	\$2,190,000
DeSoto NWR/Boyer Chute NWR	\$40,000
Neal Smith NWR	\$200,000
Horicon NWR	\$630,000
Necedah NWR	\$155,000
Leopold WMD	\$275,000
Big Stone NWR	\$290,000
Swan Lake NWR	\$2,295,050
Genoa Fish Hatchery	\$760,000
<b>Total for Illinois Refuges Only</b>	<b>4,789,000</b>
<b>Total</b>	<b>\$16,472,300</b>

(1) Note refuge areas often cover more than one county and sometimes multiple states, data by county was not available.

## Natural Resources Conservation Service

The United States Department of Agriculture’s Natural Resources Conservation Service (NRCS) undertook several projects as a result of the June 2008 floods. The two main project areas were the Emergency Wetland Protection Program (EWPP) and Floodplain Easements (FPE). In total, the cost for EWPP projects was \$1,220,499, while FPE project costs were \$7,173,595. Table 20 provides a breakdown of the project cost in each of the counties.

**Table 20: Natural Resources Conservation Service Project Expenditures**  
(Data provided by USDA, NRCS June 19, 2009<sup>(1)</sup>)

<b>Declared County</b>	<b># EWP Projects</b>	<b>Project Cost</b>	<b># FPE Projects</b>	<b>Project Cost</b>
Adams	2	\$ 573,000	1	\$ 660,101
Clark	1	\$ 4,500	3	1,008,575
Coles	3	\$ 66,000		
Edgar	2	\$ 65,000		
Hancock	1	<sup>(2)</sup>		
Henderson	2 to 3	\$ 129,000		
Jasper	1 <sup>(3)</sup>	\$ 216,000		
Lawrence	4	\$ 167,000	1	1,000,900
Other Entities			4 <sup>(4)</sup>	4,504,019
<b>Total</b>	<b>17</b>	<b>\$1,220,500</b>	<b>9</b>	<b>\$7,173,595</b>

Notes:

- (1) The following counties did not receive funding for conservation projects Clark, Crawford, Cumberland, Douglas, Greene, Jersey, Lake, Madison, Mercer, Monroe, Pike, Randolph, Rock Island, Scott, St. Clair, Whiteside, and Winnebago.
- (2) Estimates for this Emergency Watershed Protection project unavailable.
- (3) This EWP project is in Jasper, Crawford and Clark counties.
- (4) “Other Entities” refers to Kendall, Pope, Stephenson, and White counties. FPE projects in those counties cost \$97,555, \$134,400, \$1,344,345, and \$2,217,819 respectively.

## Summary of Assistance by County

Table 21 below presents the total federal assistance that was provided to Illinois counties affected by the floods of 2008. Of the assistance reports included in the table, Adams County ranks the highest in total loss, with Henderson a close second, and Hancock a distant third. As can be seen by the rankings, there were three geographic areas that were most affected. The first is the midsection of Illinois on the Mississippi River and includes the counties of Adams, Henderson, Hancock, Mercer, Pike and Rock Island counties. The second is a corridor on the eastern part of Illinois which includes Edgar, Douglas, Jasper and Lawrence counties. The third area is Winnebago County.

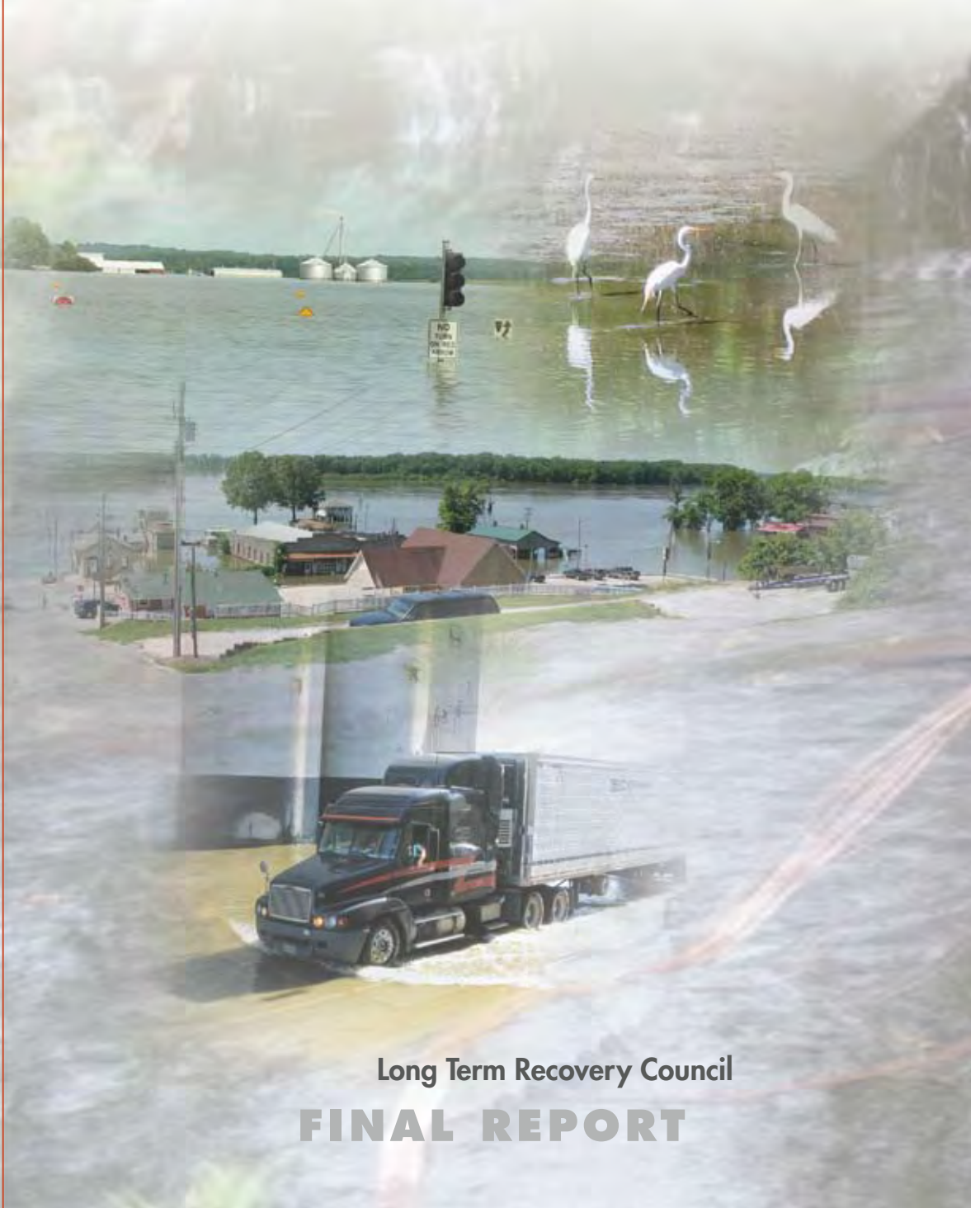
**Table 21: Total Federal Assistance Provided to Illinois Counties Affected by the 2008 Flood**

<b>County</b>	<b>Federal Assistance Provided</b>
1. Adams	\$ 45,876,338
2. Henderson	\$ 34,721,504
3. Hancock	\$ 24,675,373
4. Lawrence	\$ 19,744,875
5. Pike	\$ 18,774,481
6. Madison	\$ 13,100,590
7. Mercer	\$ 13,016,323
8. Edgar	\$ 12,819,122
9. Winnebago	\$ 12,142,489
10. Rock Island	\$ 10,077,612
11. Douglas	\$ 10,020,595
12. Jasper	\$ 9,342,181
13. Greene	\$ 8,438,491
14. Coles	\$ 8,238,746
15. Whiteside	\$ 7,083,534
16. Clark	\$ 7,006,308
17. Randolph	\$ 6,275,889
18. Crawford	\$ 4,941,082
19. Calhoun	\$ 4,796,152
20. Jersey	\$ 3,902,159
21. St. Clair	\$ 3,739,968
22. Scott	\$ 3,739,466
23. Lake	\$ 3,300,176
24. Cumberland	\$ 3,083,116
25. Monroe	\$ 2,736,225
Other Entities	\$ 43,412,287
<b>Total <sup>(1)</sup></b>	<b>335,005,082</b>

(1) Total does not include Fish and Wildlife Refuges as they included multiple counties, nor does the total include economic disruption data provided by IDOT as this was not a form of assistance provided to counties.

# Chapter III

## Comprehensive Economic Impact Analysis of the Flood



Long Term Recovery Council  
**FINAL REPORT**



## **Introduction**

Documentation of the economic impacts of unexpected events such as earthquakes, floods, tsunamis and other climatic activities has not been a prominent feature of the economic analysis literature. In large part, this stems from the fact that most equilibrium models operate under equilibrium conditions and rely on long series of data for calibration and estimation. Unexpected events present a problem since they are unique, relatively unpredictable (especially in terms of timing), and data collected about the event is often less precise and consistent than normal standards.

Notwithstanding these problems, several attempts have been made in the recent past to advance the state of the art. A notable source is the work of Okuyama and Chang<sup>(2)</sup> that provided in one volume a collection of a diverse set of approaches to this problem. Researchers struggle with issues of the appropriate spatial definition (e.g. community, county, state), the appropriate time period (days, month, quarter, etc.), and the myriad problems of sorting out the negative effects from the positive stimuli associated with recovery investments.

In this report, the focus will be at the county level, since this appears to be the most geographically relevant unit, and the time frame adopted will be monthly. The choices stem, in large part, from data availability and the constraints imposed by decision-making units that, as yet, do not extend to groupings of counties in rural areas.

This chapter is organized into six sections. In the first section some background for the analysis will be provided. Unexpected events do not occur in an economic vacuum, and an attempt will be made to set the flood of 2008 in the general economic setting that characterized the Illinois economy at that time. The Prior Analysis section will review some work of the analyses conducted in Illinois on the 1993 flood. The third section, the Analysis Framework section, provides an analysis of income and income per capita by county, as well as a migration analysis by county. The fourth section documents the economic modeling and empirical results of analysis of the June 2008 flood impact. This section presents the models and results of the 2008 flood impact with specific attention to the county level. The fifth section provides a state-wide perspective, examining the impact of the flood on the Illinois economy as a whole. The final section offers some concluding comments.

## **Background**

Floods occur in very specific geographic spaces that most often cut across jurisdictional boundaries, state lines, and other human-generated subdivisions of reality. While river basins are recognized as important features in hydrographic and environmental research, they are rarely embraced as meaningful economic units. Accordingly, socio-economic data often have to be

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<sup>(1)</sup> The authors acknowledge the generous contributions of Dr. Yu Xiao who conducted much of the prior analysis of the 1993 floods.

<sup>(2)</sup> Okuyama, Y., and S. Chang (Eds.). 2004. *Modeling Spatial and Economic Impacts of Disasters*. Springer. Heidelberg, Germany.

manipulated to “fit” the geographic “contours” of flooded areas, or a compromise adopted whereby aggregations of counties are considered. The issue becomes more difficult when the percentage of a county that is impacted by a flood is much larger or smaller than adjacent counties. Thus, aggregating counties into a “flooded region” for assessment can overlook important spatial variations within these regions. The issue, unfortunately, is endemic in any spatial analysis. At the state level, the problem is even more severe, and analysis conducted at this level may significantly overstate or understate the impacts that occur in specific counties.

As a result, it was difficult to integrate the precise physical demarcations of the flooded region presented in the WIU Reference Materials (Appendix A) with the analysis presented here. Economic regions rarely map into physical regions. This is especially the case in rural counties where home-to-work trips are often extensive given the limited employment opportunities present in any one county. Hence, the economic analysis is presented at the level of the county, embracing the whole of the county for each of the counties that were affected by flooding.

While the state-wide impacts are presented in this report, they should be viewed as merely macroeconomic indicators of the magnitude of the problem generated by the 2008 flood. These results are not an attempt to minimize the magnitude of the impacts by moving to a very highly aggregated definition of space.

A second issue is that floods occur during different stages in the development of an economy and at different points in the business cycle. Further, long-term structural changes can exacerbate or mitigate the impacts of floods. In the last three decades, the state of Illinois, along with most of the Midwest, has experienced a dramatic structural change in the composition of the economy. At the same time, the State’s economic structure has changed to a point where the State’s economy now looks much more like that for the United States as a whole than for many of its Midwestern neighbors. However, the State has not behaved like the Nation as a whole in an economic sense. For example, both Illinois and the United States recorded employment peaks in November 2000 prior to entering the 2000-2001 recession. While the United States recovered its prior peak by February 2005, Illinois was still more than two to three years away (at then current growth rates) from recovering its peak in June 2008. Employment was over 100,000 lower than in November 2000; further, when consideration is given to decreases in labor force participation rates (the percentage of the population over 16 in the labor force) and increases in the population of the state, a more realistic target to achieve the same population levels as November 2000 would be 150,000.

However, June 2008 marked the first of 12 consecutive months (and counting) of employment declines in Illinois. Since the beginning of the recession in December 2007, Illinois has posted negative job changes 17 times, and the state has lost 293,300 jobs in this recession. Of these losses, 254,100 jobs (86.6%) have been lost since September 2008. Hence, the June 2008 floods occurred during what has now been determined to be the most serious business cycle downturn since the 1930s, with Illinois now recording unemployment rates not seen in over a quarter of a century. Further, much of the stimulus from recovery is often directed to residential housing reconstruction, a sector of the economy that has disproportionately suffered in the current recession.

This economic context is important since any estimated job losses associated with the 2008 flood are likely to be dwarfed by the magnitude of the economic declines. To date, the economic recession has resulted in the loss of close to 307,600 jobs, of which 272,600 have occurred in the last 12 months. That said, it is still important to assess the economic impacts of the flood since while unexpected — in terms of time and less so in terms of space — the probability of another flood event in many of the same locations is very high. This probability is likely to increase if forecasted patterns of long-term climate change increase the incidence of major summer storms in the Midwest over the coming decades.

### **Prior Analysis**

Disaster economic impact studies are a relevant and important component of research for hazard relief and disaster management. The scope of research topics includes:

- a) Assessing economic losses resulting from a real or hypothetical event;
- b) Evaluating short- to long-term economic outcomes at various geographic and jurisdictional scales; and
- c) Studying individual decision-making processes in response to disasters.

In terms of research methods, many researchers have investigated how economies respond to disaster by taking one of the following two paths:

- a) A simulation modeling approach that forecasts a local economy under a theoretical framework and introduces systematic changes to evaluate the impacts of an hypothetical or real event using analytical tools such as input-output (IO) models, social accounting matrices (SAM), mathematic programming (MP) models, computable general equilibrium (CGE) models, and regional econometric models; or
- b) An empirical assessment approach that directly assesses the impacts of real events with loss estimations and evaluations of hypothetical events. Empirical assessments have generally evaluated short- or long-run aggregate economic impacts and have explored the behavioral adjustment process. Qualitative methods such as interviews and field observations were the dominant research methods before 1970s. In the 1980s, research began to explore net economic impacts on private sector business and on aggregate jurisdictional and economic units. The two approaches — quantitative and qualitative — should be seen as complements, not competitors, since they offer very different perspectives that once integrated provide a much more complete picture of events.

Previous work undertaken by researchers in the Regional Economics Applications Laboratory (REAL) addressed the impacts of the 1993 Midwest flood, the most costly flood in United States history, as a case to understand the micro-level business adjustment process and its macro-level manifestation in aggregate local economic outcomes. The main goal was to understand and examine how local economies react and adjust to shocks associated with natural disasters. Methods such as quantitative time series models with a quasi-experimental research design and case study were applied in the research. By taking advantage of long-range data time series, the quantitative analysis of affected counties in the 1993 Midwest flood would be able to provide a comprehensive assessment of short- to long-term local economic impacts.

The study of the 1993 Midwest flood found that places are resilient to disasters. According to the findings, the 1993 Midwest flood caused very minimal, or only temporary, negative economic impacts the year of the event, as measured by the unemployment rate, the unemployment level, the number of businesses and jobs lost, the decline in per capita income, and per employee earnings. Migration is an important mechanism of labor market adjustment. Small, heavily damaged counties saw a boost in out-migration in 1993 and growth of in-migration one year after. The study also found that impacts at the community-level may be highly variable, even if the region as a whole recovers quickly.

A complementary analysis of the 1993 flood's impact on the state of Iowa found the surprising result that, at the end of the year, the state's gross product was higher than forecast. This counterintuitive finding could be traced to the massive amount of federal disaster funding that was allocated to the state to rebuild homes, businesses and critical infrastructure systems. A companion piece of research on the economic impacts of major climatic events (such as hurricanes), as well as floods and tornadic activity, came to similar conclusions. It was not that the research design was flawed, but that when the analysis was conducted at an aggregate (state) level, and for a time period of a year, in most cases, the downturn in economic activity generated by the major incident was dwarfed by the stimulus of disaster relief efforts. The lessons from these experiences were: 1) analysis needs to be conducted at multiple spatial scales, and 2) the time period for analysis adopted (i.e. a year) was too coarse, requiring the use of either monthly, or failing that, at least quarterly information. These lessons have been adopted in the sections that follow.

## **The Analysis Framework**

### *Analysis of Income and Income per Capita by County*

According to the FEMA report, 38 counties in Illinois were considered as 1993 Great Flood Declared Counties during the Great Midwest Flood of 1993 (Figure 13).



**Figure 13: 1993 Great Flood Declared Counties in Illinois**

In the study conducted by Yu Xiao, she was able to take advantage of the fact that the St. Louis Army Corps of Engineers District documented fairly comprehensively and consistently the flood damage and emergency response/ mitigation costs for 27 counties (15 Illinois counties and 12 Missouri counties). Thus, we took a close look at the identified 15 counties in Illinois. Table 22 provides the socio-economic information for the 15 counties in Illinois. Due to data availability constraint, we will not be able to obtain data for the counties in the latest 2008 flood in Illinois for some months yet, especially if consideration is given to charting the recovery paths. However, the analysis of the 1993 flood will help further our understanding about the dynamic effects on economics at the county level.

**Table 22: Socio-economic Information for 15 Flood Affected Counties in Illinois**

<i>County</i>	<i>Per Capita Income Yr 92 (\$1,000)</i>	<i>Pct. Income from Farming Yr 92</i>	<i>Poverty Rate Yr 90</i>	<i>Per Capita Total Damage Yr 93</i>
<i>Alexander</i>	12.9	2.2	32.2	947.0
<i>Brown</i>	12.7	7.4	13.5	319.0
<i>Calhoun</i>	16.0	7.0	15.1	5599.0
<i>Cass</i>	17.2	5.5	13.9	511.0
<i>Greene</i>	14.3	5.9	15.5	1690.0
<i>Jackson</i>	14.5	1.0	28.4	82.0
<i>Jersey</i>	16.8	3.7	9.7	1642.0
<i>Madison</i>	19.4	0.3	11.3	32.0
<i>Monroe</i>	20.0	1.7	4.8	4439.0
<i>Morgan</i>	17.4	2.9	11.2	88.0
<i>Pike</i>	15.3	11.2	17.9	2666.0
<i>Randolph</i>	15.5	1.0	11.0	471.0
<i>St. Clair</i>	18.0	0.4	17.4	58.0
<i>Scott</i>	15.2	9.0	11.5	860.0
<i>Union</i>	15.3	3.3	18.2	166.0

**Table 23: Yearly Income Per Capita Values for 15 Flood Affected Counties in Illinois (in 1992 dollars)**

	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>
<i>Illinois</i>	21,703	22,550	22,443	22,940	23,563	24,345	25,105
<i>Alexander</i>	12,448	12,935	12,798	12,963	13,178	13,739	14,365
<i>Brown</i>	11,528	12,682	13,154	13,184	13,152	13,420	13,605
<i>Calhoun</i>	14,443	15,961	15,207	16,165	16,408	17,712	18,433
<i>Cass</i>	16,370	17,203	16,733	17,483	16,823	18,639	19,520
<i>Greene</i>	12,941	14,255	13,254	13,233	13,042	14,809	15,374
<i>Jackson</i>	14,110	14,539	14,358	14,924	15,572	15,898	16,598
<i>Jersey</i>	15,479	16,752	16,640	17,587	18,216	19,061	19,785
<i>Madison</i>	18,615	19,373	19,386	19,712	20,068	20,550	21,255
<i>Monroe</i>	18,620	19,962	19,622	20,785	21,611	22,589	24,029
<i>Morgan</i>	16,462	17,406	16,918	17,599	17,310	18,406	19,069
<i>Pike</i>	14,440	15,273	14,547	14,467	14,617	16,651	16,800
<i>Randolph</i>	15,089	15,518	14,511	14,737	14,923	15,453	16,299
<i>St. Clair</i>	17,028	18,040	17,719	18,186	18,690	19,265	20,025
<i>Scott</i>	14,146	15,217	14,489	15,293	14,630	16,804	17,393
<i>Union</i>	14,966	15,311	14,860	14,978	15,590	15,751	16,493

## Per Capita Income for 15 Illinois Counties in 1992

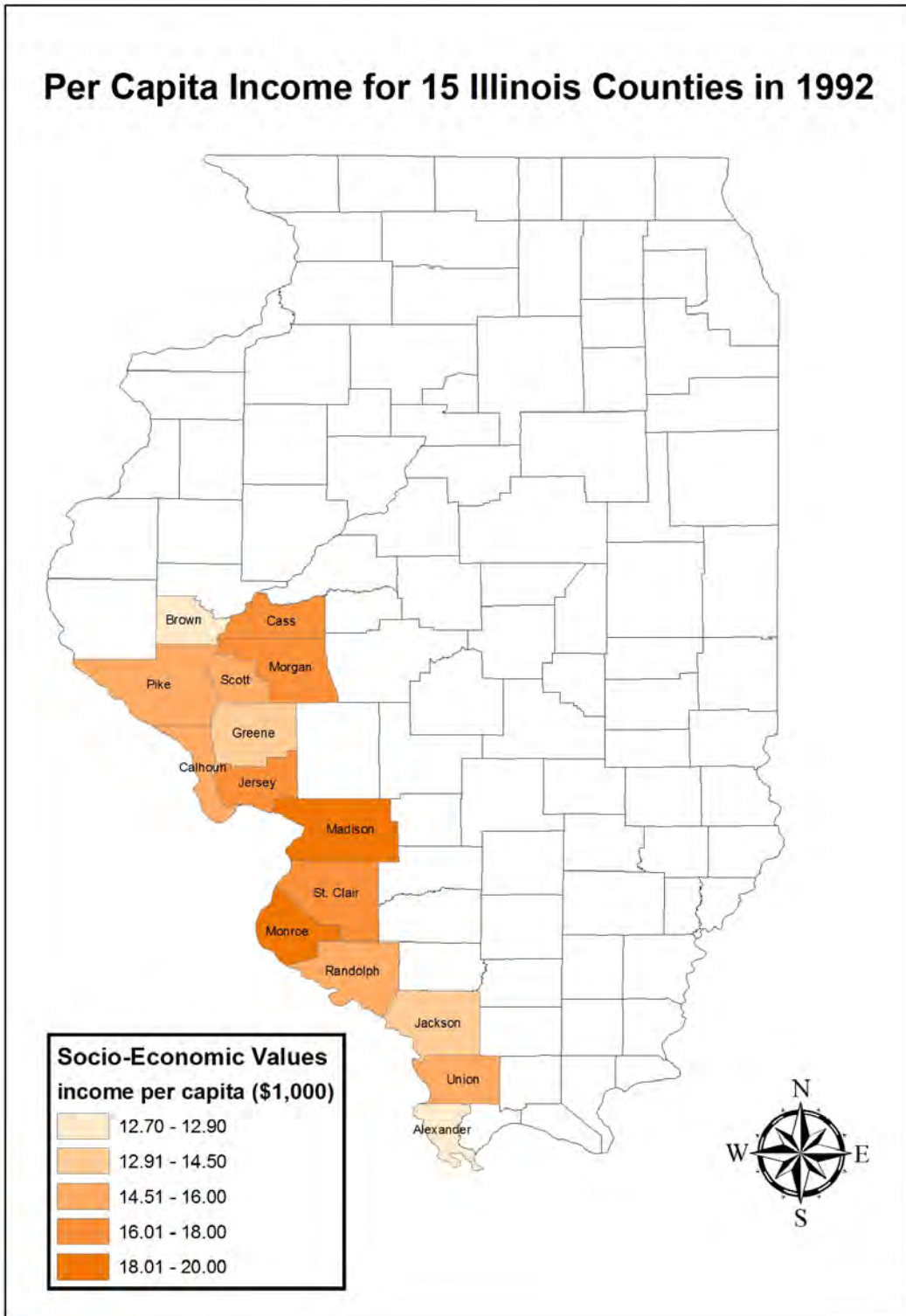
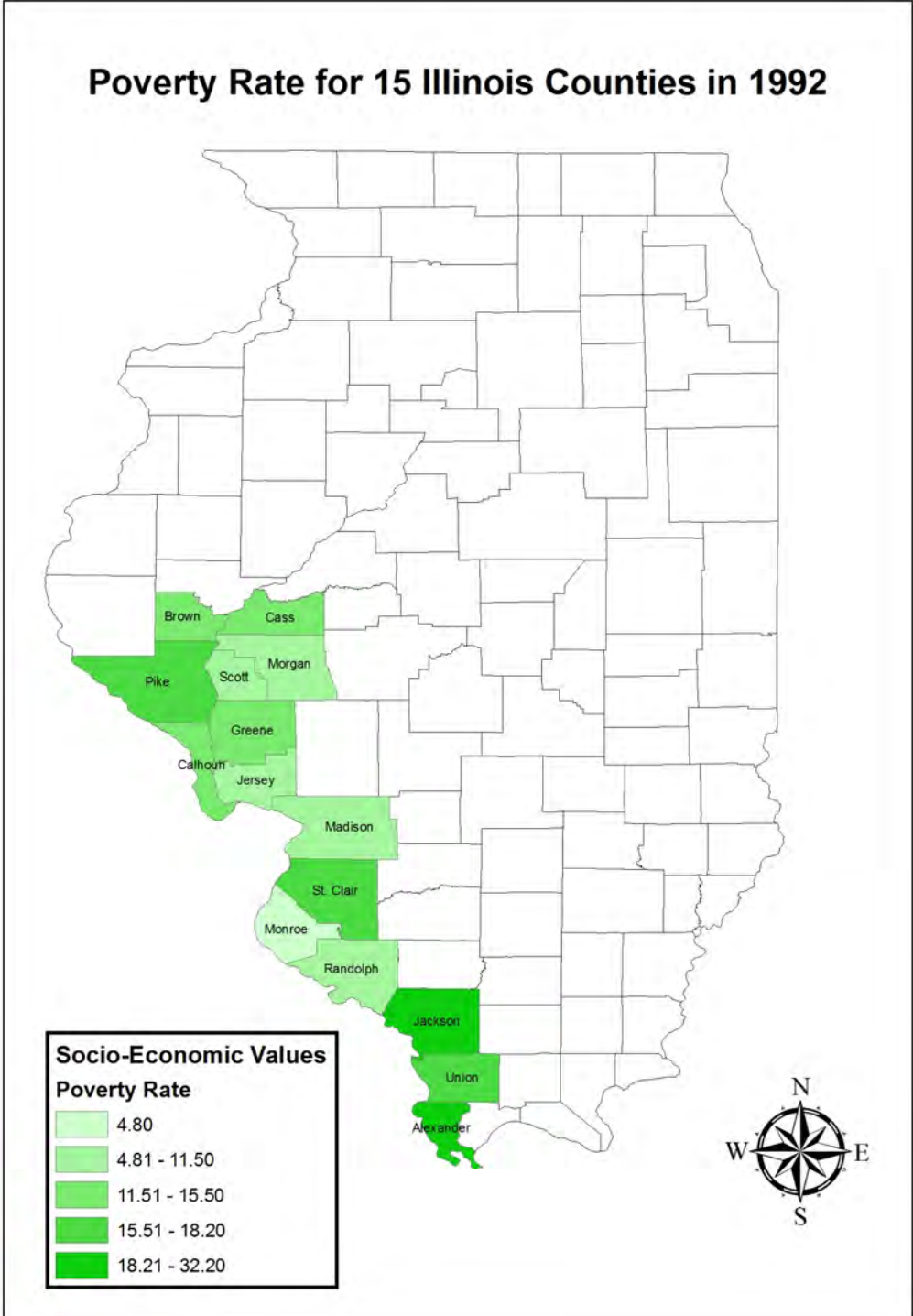


Figure 14: Per Capita Income for 15 Flood Affected Counties in Illinois in 1992



**Figure 15: Poverty Rate of 15 Flood Affected Counties in Illinois in 1992**



In the early 1990s, most of the 15 Illinois counties were predominately rural and had higher poverty rates. A large proportion of the counties received a higher share of income from farming than the national average. The per capita income of the 15 counties was also lower than the national average in 1992 and they tended to have higher poverty rates than the national average (in 1992, the national average income per capita was \$20,900 in 1992 dollars and the U.S. average poverty rate was 14.1.). This combination would most likely generate special economic circumstances that would lead to high proportional economic losses and slower recovery in the 15 counties after the 1993 flood.

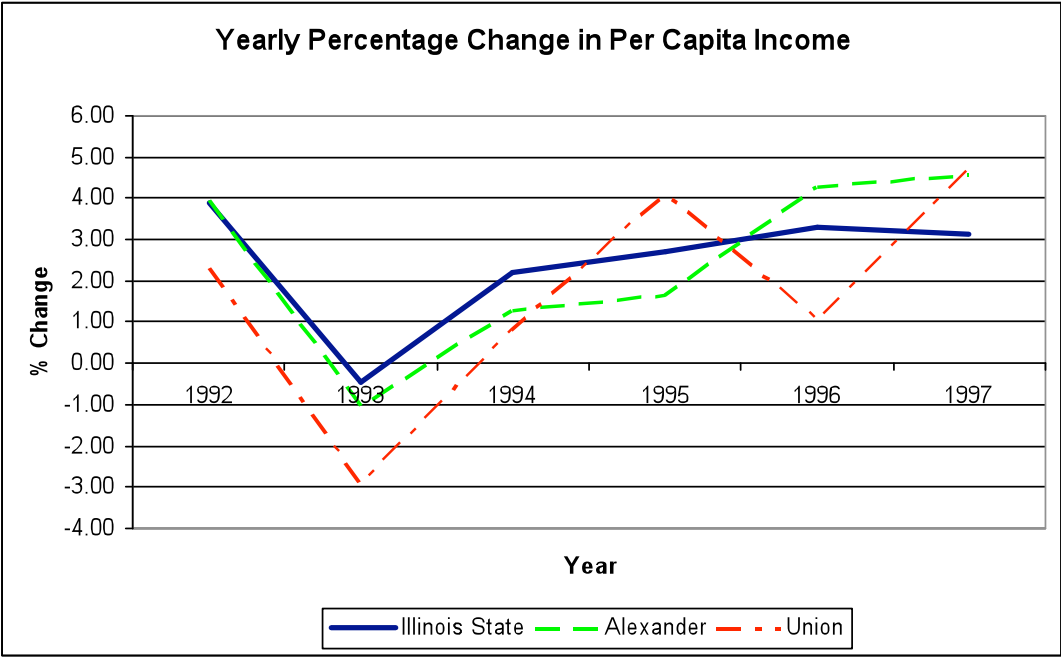
A summary of the findings from Yu Xiao’s study of the 1993 flood related to per capita income:

- a) Residential damage per capita was significantly and positively associated with high employment growth one year after the flood. Employment boomed in counties with high residential damage, possibly due to construction booms in the severely damaged communities.
- b) Counties that suffered less flood damage per capita seemed to do worse after the flood. Those counties grew more slowly in employment, population and income shares after the flood.

Based upon information about income per capita for the identified counties, and in comparison to the state level, we calculated the yearly percentage change of the income per capita at state and individual county levels. The results are shown in Table 24 and Figure 16.

**Table 24: Yearly Percentage Change of Per Capita Income in 15 Illinois Counties**

	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>
<i>Illinois</i>	3.90	-0.47	2.21	2.71	3.32	3.12
<i>Alexander</i>	3.91	-1.06	1.28	1.66	4.26	4.55
<i>Brown</i>	10.01	3.72	0.23	-0.24	2.04	1.38
<i>Calhoun</i>	10.51	-4.73	6.30	1.50	7.95	4.07
<i>Cass</i>	5.09	-2.73	4.48	-3.78	10.79	4.73
<i>Greene</i>	10.16	-7.02	-0.16	-1.44	13.55	3.82
<i>Jackson</i>	3.04	-1.24	3.94	4.34	2.09	4.41
<i>Jersey</i>	8.23	-0.67	5.70	3.57	4.64	3.80
<i>Madison</i>	4.07	0.07	1.68	1.81	2.40	3.43
<i>Monroe</i>	7.21	-1.71	5.93	3.97	4.53	6.37
<i>Morgan</i>	5.74	-2.80	4.02	-1.64	6.33	3.60
<i>Pike</i>	5.77	-4.75	-0.55	1.04	13.91	0.90
<i>Randolph</i>	2.84	-6.49	1.56	1.26	3.56	5.48
<i>St. Clair</i>	5.95	-1.78	2.64	2.77	3.07	3.95
<i>Scott</i>	7.57	-4.78	5.55	-4.34	14.86	3.50
<i>Union</i>	2.30	-2.95	0.80	4.09	1.03	4.71



**Figure 16: Yearly Percentage Change in Per Capita Income for Illinois, Alexander County and Union County**

Some possible relationships between flood damage and economic outcomes were explored by using a small sample of counties for which more extensive damage data were available. In Figure 16, the graphs of the yearly percentage change in per capita income for Illinois, Alexander county and Union county are presented. The findings are in accord with Yu Xiao’s conclusion that regional, state and local economies were resilient to the flood. In the year of flood, there were short-run negative economic impacts on state gross product and county-level total personal income. For instance, flood-affected counties, such as Alexander and Union, all showed a lower percentage change in per capita income in the years 1993 and 1994. However, in the years afterwards, state and local economies bounced back and sometime did even better than prior to the 1993 flood, as measured by gross product and income per capita.

Once the long range time series data becomes available, the above findings could be further tested for the June 2008 flood in Illinois.

*Migration analysis by County*

Migration is measured by the percent of population that in-migrate to a county and out-migrate from a county, and the net in-migration rate:

$$\text{Immigration rate} = (\text{Number of In-migrants} / \text{Population}) * 100 \% ;$$

$$\text{Emigration rate} = (\text{Number of Out-migrants} / \text{Population}) * 100 \% ;$$

$$\text{Migration rate} = (\text{Number of Net In-migrants} / \text{Population}) * 100 \% ;$$

Migration, whether permanent or temporary, has always been a traditional response or survival strategy of people confronting the prospect, impact or aftermath of disasters. However, nowadays, more than ever, the complex nature of disasters brings with them an enormous potential for the uprooting of large numbers of people (for example the out-migration of up to one third of the New Orleans' population as a result of Hurricane Katrina). The increasing complexity of disaster is rooted in the interplay of social and economic factors in the environment, exacerbating the vulnerability of people and environments and intensifying their impacts when they occur.

Most local displacement or migration due to flooding tends to be temporary, but may become permanent, particularly if the disaster permanently alters or destroys a local economic base. The combination of increasing population and population density, and increasing poverty has accentuated the vulnerability to natural disasters like floods and increases the probability of forced migrations.

According to the findings of Yu Xiao in her study of the Great Midwestern Flood in 1993, in terms of overall relocation, migration affected only the heavily damaged, small counties and for just two years. The flood forced people from their homes in the small, heavily damaged counties. However, in the long run, there were either no effects or possibly positive effects on population. Large-scale out-migration helps explain the rapid adjustment of unemployment rates after the flood. While the small, heavily damaged counties suffered high unemployment during the year of flood, they also saw high emigration, which likely helped alleviate unemployment tension in the local labor markets. With the displaced and unemployed flood victims moving out of the area, the labor market was able to adjust quickly but any new equilibrium between supply and demand would probably be at a lower overall rate of employment.

## Economic Modeling and Empirical Results of Analysis of the June 2008 Flood Impact

### Employment Analysis

**Table 25: Employment Impact between May 2008 and June 2008**

	May 2008	June 2008	Employment Change (%)	Compare with State Employment Change (%)
<b>Winnebago</b>	137443	137838	0.287	0.011
<b>Lake</b>	339376	343776	1.296	1.020
<b>Whiteside</b>	21224	21125	-0.466	-0.742
<b>Rock Island</b>	80427	80587	0.199	-0.077
<b>Mercer</b>	3197	3157	-1.251	-1.527
<b>Henderson</b>	1126	1138	1.066	0.790
<b>Hancock</b>	5016	4926	-1.794	-2.070
<b>Adams</b>	34480	34305	-0.508	-0.784
<b>Jersey</b>	5190	5248	1.118	0.842
<b>Calhoun</b>	893	904	1.232	0.956
<b>Douglas</b>	7294	7304	0.137	-0.139
<b>Edgar</b>	6700	6647	-0.791	-1.067
<b>Coles</b>	24758	24389	-1.490	-1.766
<b>Cumberland</b>	2371	2377	0.253	-0.023
<b>Jasper</b>	2447	2379	-2.779	-3.055
<b>Clark</b>	4966	4845	-2.437	-2.713
<b>Crawford</b>	7314	7291	-0.314	-0.590
<b>Lawrence</b>	4775	4806	0.649	0.373
<b>Illinois</b>	5912442	5928762	0.276	

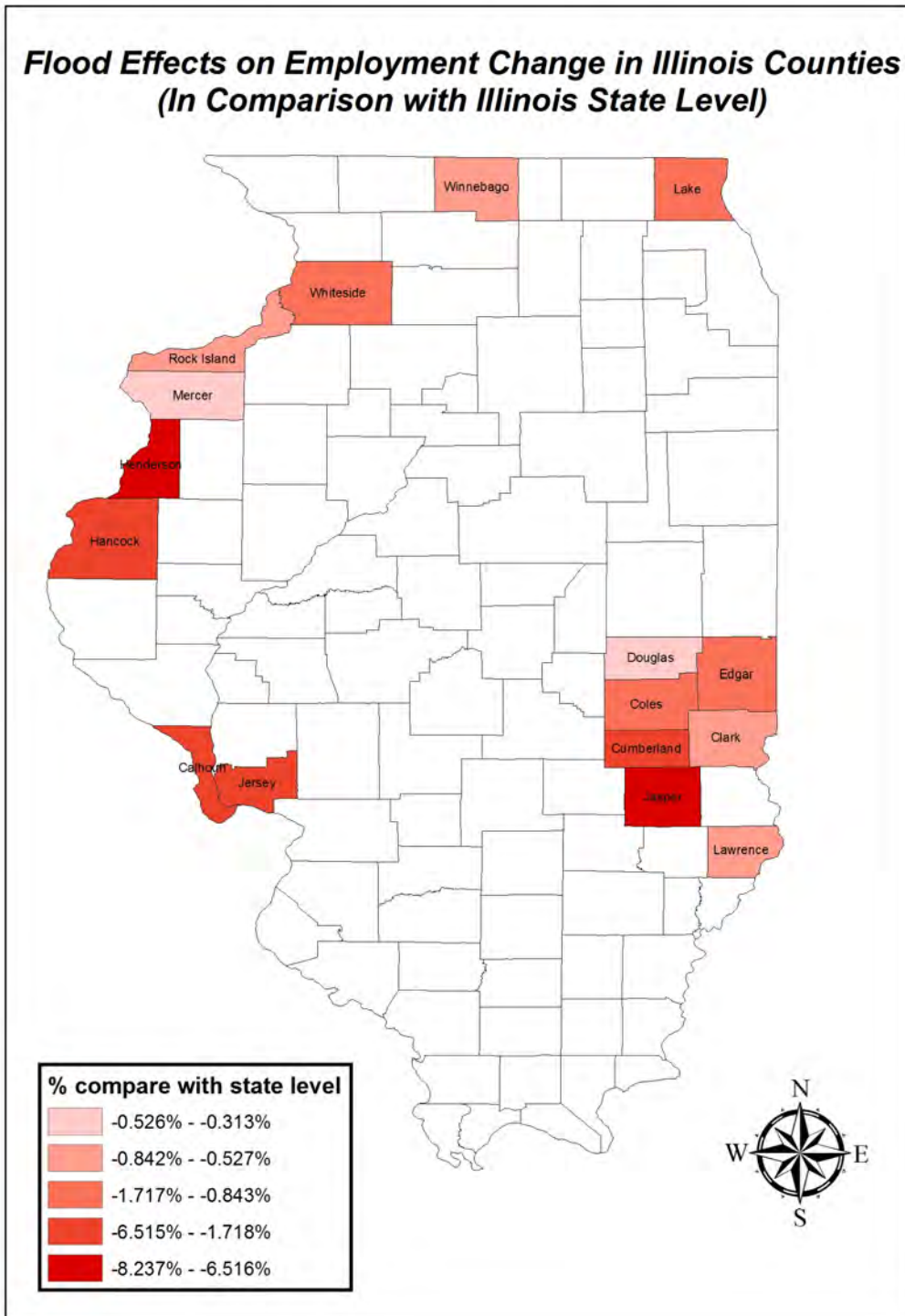
The 18 counties specified above were designated by FEMA as counties that needed individual assistance, public assistance, or both. The first task was to explore the employment change at the county level for those 18 counties during the time period of May 2008 to June 2008. (The occurrence of flood in Illinois was in mid-June.) The overall state level of employment change during the same period was 0.28%; 12 out of 18 counties (in yellow shading in Table 25) showed lower employment change rates than the overall Illinois rate. By comparing the employment change rate in the same time period between state and individual county levels, we could possibly cancel off the unspecified/ hidden economic conditions occurring nation/ statewide that might also result in employment change other than that caused by the flood. The negative values in the last column of Table 25 provide clear evidence of the instant negative effects of the flood on employment in those 12 counties. The employment change rate in most of those flood-affected counties were relatively below the state average for the same period. Six counties, Winnebago, Lake, Henderson, Jersey, Calhoun and Lawrence, still maintained a higher rate of positive employment change than the state level (0.276%). Later, employment change rate at the county level for the same 18 counties, but during a different period — June 2008 and July 2008 — was examined (Figure 17) (i.e., one month after the occurrence of the June 2008 flood in Illinois). The State’s level of employment change rate during this period was -1.43%, indicating a decrease of employment from the previous month. The negative values shown in the last column of Table 26 illustrate that 16 of the 18 counties experienced even sharper decreases in employment rates than the overall state level. Crawford County seems to have had a resilient

economy in that after undergoing a negative change in employment in June the employment rate increased, as evidenced by the positive employment change in July. In other words, the flood in June 2008 only cast a short-term negative effect on employment in Crawford County. In Adams County, the change of employment was negative in July but remained above the state level. Results from Table 25 and Table 26, indicate that the influence of the 2008 flood on employment in affected counties began to appear one month after the flood. During the period June – July 2008, Henderson County was most severely affected; the percentage decrease in employment was 8% below the average decrease of employment in the state.

**Table 26: Employment Impact between June 2008 and July 2008**

	<b>June 2008</b>	<b>July 2008</b>	<b>Employment Change (%)</b>	<b>Compare with State Employment Change (%)</b>
<b>Winnebago</b>	137838	135124	-1.969	-0.540
<b>Lake</b>	343776	335851	-2.305	-0.877
<b>Whiteside</b>	21125	20645	-2.272	-0.844
<b>Rock Island</b>	80587	78907	-2.085	-0.656
<b>Mercer</b>	3157	3102	-1.742	-0.314
<b>Henderson</b>	1138	1028	-9.666	-8.238
<b>Hancock</b>	4926	4771	-3.147	-1.718
<b>Adams</b>	34305	33843	-1.347	0.082
<b>Jersey</b>	5248	5078	-3.239	-1.811
<b>Calhoun</b>	904	869	-3.872	-2.443
<b>Douglas</b>	7304	7173	-1.794	-0.365
<b>Edgar</b>	6647	6490	-2.362	-0.933
<b>Coles</b>	24389	23781	-2.493	-1.064
<b>Cumberland</b>	2377	2291	-3.618	-2.190
<b>Jasper</b>	2379	2190	-7.945	-6.516
<b>Clark</b>	4845	4747	-2.023	-0.594
<b>Crawford</b>	7291	7353	0.850	2.279
<b>Lawrence</b>	4806	4712	-1.956	-0.527
<b>Illinois</b>	5928762	5844070	-1.428	

**Flood Effects on Employment Change in Illinois Counties  
(In Comparison with Illinois State Level)**



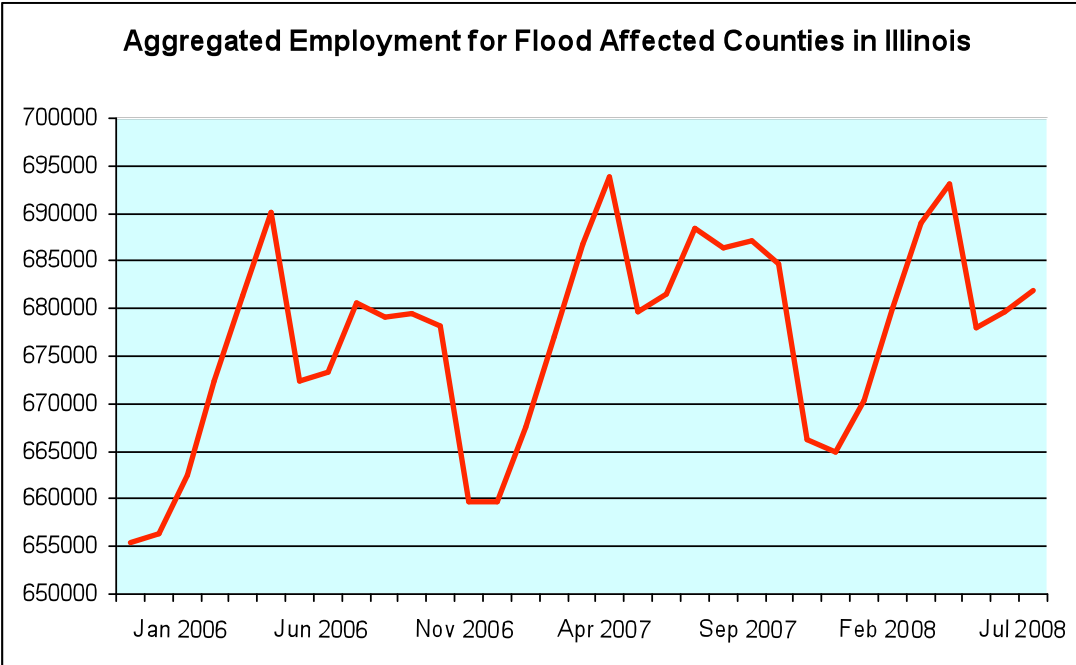
**Figure 17: Percentage employment change below the average Illinois level from June 2008 to July 2008**

A stochastic, time-series autoregressive integrated moving average (ARIMA) model was used to analyze the dynamics of changes, variations, and interruptions in the flood-affected counties' employment using time series data. This ARIMA model was used to verify whether the flood impacted the employment level in the counties in Illinois in any significant fashion and the nature of effect, if any. The details of the ARIMA model are provided at the end of this section. In particular, the model was used under what is referred to as an *intervention analysis framework*. In this case, the intervention to be tested was the degree to which the flood significantly changed the pattern of employment growth in the affected counties. Consider a time series of data (such as employment by county by year), by modeling these data, we can explore the rate of growth or decline over time. One approach might be to measure the change in employment from one year to the next as a function of changes in prior years. Depending on the county, this relationship may be stable, increasing, or decreasing. Whatever the pattern, the assumption is that the relationships hold for the whole time period. Now, at some point during this time period, a flood occurs; the issue to be addressed is — did the flood change the long-term relationship in any significant way? Intervention analysis helps by identifying the degree to which the post-flood relationships are different from the longer-run trends.

### *Empirical Analysis and Results*

Data for the period between January 2006 and September 2008 (monthly county level employment data for Illinois) provided by Bureau of Labor Statistics (BLS) and the Illinois Department of Employment Security (IDES) were used for the impact analysis of the June 2008 flood event in the Illinois. Again, the 2008 flood was considered as the major event affecting employment in Illinois counties during the period under study.

First, for each county that suffered in the June 2008 flood in Illinois, the total aggregated value of all 18 flood-affected counties' (according to FEMA's Disaster Declaration map) employment on a monthly basis between January 2006 and September 2008 are shown in Figure 18. Then, the data series were entered into the ARIMA intervention model. Part of the problem encountered here was that some counties had widespread impacts, while for others the impact only covered a relatively small portion (usually adjacent to the river). There would appear to be an opportunity to integrate the GIS mapping analysis presented by WIU (Appendix A) to better determine the region of impact. However, as noted earlier, the *physical* area affected may not "map" into the *economic* area affected. For example, the disruption in some communities may have had broader consequences by virtue of production disruptions and commuting to work across county boundaries.



**Figure 18: Overall aggregated level of monthly employment for identified 18 Illinois Counties**

The analysis can be conducted to explore differences between short-run and long-run effects (see end of Chapter). Surprisingly, the results revealed that the flood in those counties in Illinois generated a positive effect on the aggregated employment change level, which means that there are no statistically significant negative effects on employment from the June 2008 flood (against most of our common anticipation). However, a concern here is that the model still cannot isolate other possible effects that might influence the employment level besides the flood effect. In this context, the discussion from the Prior Analysis section that focused on the general economic conditions in the State may have served to reduce the apparent impact of the flood. To test this assumption, the lagged monthly employment value was used as a control variable and incorporated into the model (see end of Chapter). The intervention analysis considered the employment level for the three months following the flood. The results revealed that the flood had a negative influence on the overall aggregated employment level for the 18 affected counties.

The prior analysis was conducted for an aggregation of all affected counties. Next, an analysis of individual county effects was performed. All counties revealed the expected negative sign (i.e., the flood did have an affect) except for Calhoun, Coles and Crawford Counties. For the latter three counties, the positive values suggest that employment actually increased.

The empirical literature suggests that the extent and size of damage affects business recovery (Kroll *et al.*, 1991; Dahlhamer and Tierney, 1998). Similarly, at the county-level, one would expect that small counties with flood damage would have a harder time recovering and would in turn suffer a higher percentage loss of employment in the medium run. Being small, such counties are less able to absorb shocks and have less capital and manpower to rebuild. Hence, flood damage relative to economic size (such as percentage employee loss in the medium run)



can better account for the extent of real damage to a local economy than the simple level of damage.

Hence, Table 27 incorporates the estimated flood effects under the ARIMA model and the employment level for each identified county in May 2008 (the month before flood occurred), and reports the medium run percentage employee loss based on May 2008 employment levels as follows:

$$\text{Percentage Decrease \%} = (- \text{Flood Effects} / \text{Employment May 2008}) * 100 \%$$

**Table 27: Percentage Decrease of Employment Level due to the June 2008 Flood in Illinois**

	<i>Flood Effects</i>	<i>Employment May 2008</i>	<i>Percentage Decrease %</i>
<i>Winnebago</i>	-498.8214	137443	0.362929651
<i>Lake</i>	-1296.534	339376	0.382034675
<i>Whiteside</i>	-48.5357	21224	0.228683095
<i>Rock Island</i>	-274.3571	80427	0.341125617
<i>Mercer</i>	-5.4286	3197	0.16980294
<b><i>Henderson</i></b>	-14.886	1126	<b>1.322024867</b>
<i>Hancock</i>	-26.2168	5016	0.522663477
<i>Adams</i>	-210.7143	34480	0.61112036
<b><i>Jersey</i></b>	-85.7015	5190	<b>1.65128131</b>
<i>Calhoun</i>	1.1071	893	-0.123975364
<i>Douglas</i>	-24.7143	7294	0.338830546
<i>Edgar</i>	-33.5714	6700	0.501065672
<i>Coles</i>	150.1429	24758	-0.606441958
<i>Cumberland</i>	-24.5357	2371	1.034824968
<b><i>Jasper</i></b>	-36.0376	2447	<b>1.472725787</b>
<i>Clark</i>	-39.7857	4966	0.801161901
<i>Crawford</i>	4.2289	7314	-0.057819251
<i>Lawrence</i>	-46.2512	4775	0.968611518

From the reported results of percentage decrease of employment in the medium run (three months after the flood in Illinois), it can be seen that counties such as Jersey, Jasper and Henderson were the three counties with the most severe percentage loss of employment due to the 2008 flood. If we only look at the reported econometric results on the flood effects on employment, without considering the size of usual employment levels in each county, the result very probably would lead us to the conclusion that Lake County suffered the most in this natural disaster event. However, after taking into consideration the fact that Lake County maintained a relatively high overall employment level, the proportion of the overall employment that was lost due to the flood was actually relatively small (only 0.38%). It is not hard to notice that the most damaged counties (Henderson, Jersey, and Jasper) were the counties with relatively low employment levels. Thus, the results further confirm our initial expectations that counties with small economies tend to suffer a higher level of negative flood effects than counties with large economies which could recover easily with abundant capital and labor sources.

## Migration Analysis

At several points, mention has been made of the important role that migration — both temporary and permanent — could play in the recovery of a specific county. Unfortunately, migration data was not released in a timely way to facilitate analysis of the 2008 flood. Hence, some exploration was conducted of the potential contribution of migration in the 1993 flood. Migration data at the county level was only available from 1992 to 2006, providing the opportunity to see whether longer term patterns of migration were influenced by the 1993 flood. Tables 28 and 29 only report the time series migration information from 1992 to 2003 (to improve readability). In our intervention model test, we used the entire 1992 to 2006 time series data.

**Table 28: In-migration Rates for Illinois and Identified Counties from 1992 to 2003**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<i>Illinois</i>	4.722	4.719	4.857	4.632	4.633	4.575	4.770	4.777	4.705	4.700	4.585	4.694
<i>Alexander</i>	6.424	5.254	6.688	6.984	5.993	6.653	6.267	6.783	6.665	7.067	6.081	6.120
<i>Brown</i>	6.276	6.057	4.853	5.922	6.071	6.261	6.285	5.481	5.047	4.531	5.270	4.959
<i>Calhoun</i>	4.722	3.323	3.767	6.024	4.451	3.114	4.831	3.967	4.387	3.472	5.335	4.728
<i>Cass</i>	6.121	7.033	6.895	6.418	6.468	6.973	6.026	5.329	5.511	4.752	5.722	5.198
<i>Greene</i>	4.276	5.505	5.102	5.419	4.958	4.774	4.388	4.904	4.303	5.035	4.779	4.153
<i>Jackson</i>	9.791	9.444	10.040	9.028	8.958	9.004	9.629	8.966	9.267	9.452	8.786	9.111
<i>Jersey</i>	6.085	5.782	6.041	6.192	5.689	5.862	5.747	5.633	5.648	6.384	6.221	5.953
<i>Madison</i>	4.627	4.711	4.929	4.693	4.777	4.658	4.597	4.484	4.605	4.627	4.607	4.835
<i>Monroe</i>	6.799	6.719	6.939	6.554	6.439	7.068	6.367	6.149	5.898	6.552	6.173	6.595
<i>Morgan</i>	5.186	5.395	5.080	5.509	4.869	4.641	4.798	4.838	4.654	5.000	5.114	5.230
<i>Pike</i>	4.285	4.200	5.204	4.774	4.047	4.615	3.679	3.637	4.154	3.776	3.479	4.449
<i>Randolph</i>	4.024	5.136	4.721	4.477	4.195	4.287	4.705	4.606	4.343	4.386	4.553	4.752
<i>St. Clair</i>	7.197	6.087	6.226	6.097	6.068	5.576	5.637	5.946	5.527	5.839	5.731	5.830
<i>Scott</i>	5.574	7.436	7.532	5.950	6.322	5.198	5.354	6.059	5.225	5.498	6.284	5.209
<i>Union</i>	5.602	5.172	5.608	5.664	4.773	4.522	4.855	4.188	4.705	4.893	4.592	4.533

**Table 29: Out-migration Rate for Illinois and Identified Counties from 1992 to 2003**

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<i>Illinois</i>	5.206	5.274	5.357	5.154	5.231	5.205	5.338	5.382	5.289	5.305	5.194	5.315
<i>Alexander</i>	7.414	7.847	7.700	8.339	7.703	7.612	7.530	6.751	7.596	7.336	8.436	7.637
<i>Brown</i>	5.982	4.743	6.156	5.622	6.967	5.226	6.016	5.360	5.848	6.196	4.172	5.542
<i>Calhoun</i>	3.944	6.968	4.789	4.512	4.916	4.048	4.590	3.944	4.531	4.365	3.475	3.456
<i>Cass</i>	6.508	6.316	6.867	6.355	6.747	6.929	6.391	7.486	6.913	6.360	5.619	6.556
<i>Greene</i>	3.953	5.210	4.808	5.130	4.779	4.896	4.764	5.002	5.267	4.875	4.754	4.719
<i>Jackson</i>	9.224	10.011	10.070	9.656	10.250	10.139	10.607	10.621	10.658	9.886	9.410	9.398
<i>Jersey</i>	5.460	6.623	5.077	5.187	5.169	5.027	5.696	5.566	5.405	5.104	5.418	4.750
<i>Madison</i>	4.477	4.689	4.832	4.769	4.585	4.829	4.774	4.536	4.385	4.475	4.369	4.671
<i>Monroe</i>	4.771	5.936	4.921	4.529	4.809	4.565	4.368	4.521	4.217	4.115	4.208	4.328
<i>Morgan</i>	5.271	5.517	6.295	5.557	5.542	5.680	5.642	5.060	5.658	5.489	5.383	5.201
<i>Pike</i>	3.846	5.179	4.190	4.404	4.312	4.448	3.868	4.309	4.774	4.652	4.094	3.811
<i>Randolph</i>	4.400	4.230	4.817	4.577	4.924	5.330	4.985	4.532	4.734	5.068	4.540	4.557
<i>St. Clair</i>	6.812	6.741	7.030	6.894	6.750	6.853	6.873	6.268	6.088	5.817	5.804	6.133
<i>Scott</i>	6.477	6.833	7.089	6.480	6.395	5.539	5.752	5.488	5.526	5.979	6.336	6.637
<i>Union</i>	4.817	5.025	4.839	4.897	4.944	4.831	4.439	4.732	4.867	4.465	4.277	4.741

Using a similar model to the one that was adopted for the employment analysis, the in-migration rate series and out-migration rate series were analyzed, and a dummy variable “flood effect” was added to test its statistical effects on the change of in-migration and out-migration rates. As before, the “flood effect” was differentiated into short- and long-run flood effects. Specifically, the short-run effect considered the effects on in/ out-migration rate for the year 1993, and the long-run effect considered the effects on in/ out-migration rate for the years 1993, 1994, and 1995.

A negative sign of the coefficient estimated for the “intervention” (either long-run or short-run effect) indicates that the 1993 Great Midwestern flood cast a negative influence on the in-migration rate or out-migration rate (Table A2 at the end of the Chapter provides the detailed results). In contrast to our initial analysis on employment that showed consistent and dominantly negative signs, the signs for the in-migration rates were not always consistent. Six out of the fifteen counties experienced a decrease in the in-migration rate over the short-run, but in the long-run the in-migration rate bounced back. The six counties (Alexander, Brown, Calhoun, Jersey, St. Clair and Union), showed a quick adjustment to the flood effects due to the resilience of the economy in those counties. Another six out of the fifteen counties experienced an increase in in-migration rate over the short-run, but in the long-run the in-migration rate decreased. Thus, the flood cast a negative effect on the in-migration rates in Cass, Jackson, Madison, Monroe, Pike, Randolph, and Scott Counties. The quick and resilient adjustment of in-migration after the occurrence of 1993 Great Midwestern flood was only maintained on a short-run. In the long-run, the in-migration rate was slowed down due to the devastating effects of flood on the local economy.

Two out of the fifteen counties experienced increases in both short-run and long-run in-migration rates under the effect of flood (detailed results are shown in Table A3 at the end of the Chapter). These two counties were Greene and Morgan. If we take a closer look, it is easy to notice that in both counties, even though the estimated coefficient for the flood dummy variable in short- and long-run turned out to be both positive, the absolute value of in-migration was lowered in the long-run. Still, the influence of the flood is perceived in the long-run.

Following the same methodology used for in-migration ARIMA analysis, five out of the fifteen counties experienced both increases in short-run and long-run out-migration under the effect of the 1993 Great Midwestern Flood. These counties were Alexander, Cass, Madison, Morgan and Union. Seven out of the fifteen counties underwent increases in short-run out-migration, but in the long-run these counties witnessed a bounce back effect and experienced decreases in out-migration rate after the 1993 flood. These counties were Calhoun, Greene, Jackson, Jersey, Monroe, Pike and Scott.

Three out of the fifteen counties experienced decreases in out-migration rate in the short-run, but in the long-run they underwent increases in out-migration rate under the influence of 1993 flood. These counties were Brown, Randolph and St. Clair.

Finally, an analysis was conducted on the net-migration rate (in-migration minus out-migration). Eight out of the fifteen counties (Alexander, Calhoun, Jackson, Madison, Morgan, Pike, St. Clair

and Union), underwent a decrease in net migration due to the flood in the short-run but all experienced positive increases in net migration in the long-run, which indicated a bounce-back effect after the flood in the long-run. Five out of the fifteen counties had positive effects on net migration in the short-run, but in the long-run the 1993 Great Midwestern Flood cast a negative on the net migration rate in Cass, Greene, Monroe, Randolph and Scott Counties. Brown County experienced a negative effect on net migration rate both in the short-run and the long-run. Jersey County experienced a positive effect on net migration in both the short-run and long-run.

In terms of the magnitude of the flood effects on net-migration, counties like Calhoun, St. Clair and Madison suffered a very high level loss of net in-migration due to the flood influence in the short-run. However, in the long-run, the bounce-back effects helped bring back the displaced residents to their original counties or attracted new residents to move in. These three counties witnessed a positive effect on net-migration, and Calhoun County had the highest bounce-back effects among the three (with the value of 1.597). Table 22 illustrates that Calhoun County experienced the highest per capita total damage in 1993, and thus the long-run positive net-migration was very possibly caused by the new jobs created to rebuild the damaged houses and infrastructure in the flooded area.

The evidence here suggests that migration was a significant means of adjustment in response to the disaster. However, the notion of a resilient economy should be interpreted with caution. Although the 1993 flood was an extremely costly event, more than a quarter of the flood losses were actually paid for by the federal government. The rapid economic adjustment was possibly helped by the substantial injection of funds and assistance. There were two economic shocks in play: the negative one was caused by the 1993 Midwestern flood and the positive one was derived from the associated injection of disaster assistance. Hence, we should not attribute the so-called resilient economy to the natural economic recovery in a vacuum. It would require the difficult task of further examining the extent to which financial assistance actually helped the local economies to rebound.

### State-wide Impact of the June 2008 Flood in Illinois

In this section of the report, the focus of the analysis was at the state level. The direct impact on agriculture from the 2008 flood was from the National Agricultural Statistics Service (NASS) August 2008 Crop Production Report as shown in Table 30.

**Table 30: Economic Production Loss in Illinois Due to the 2008 Flood by Major Crop Type**

	Corn	Soybeans	Total
Acres Not Harvested	400,000	150,000	550,000
Typical Acres Not Harvested	150,000	50,000	200,000
Abnormal Acres Flooded	250,000	100,000	350,000
Average Yield (bu/Acre)	172	42	
Price/bushel	5.4	12.25	
Lost Production (\$)	232,200,000	51,450,000	283,650,000

These data and data on employment losses provided in part from the data assembled by WIU (Appendix A), were entered into a comprehensive econometric-input-output model of the Illinois economy. The results are summarized in Table 31.

**Table 31: Economic Impact of the 2008 Flood in Illinois**

	<b>Output</b> <b>(million \$)</b>		<b>Income</b> <b>(million \$)</b>		<b>Employment</b> <b>(thousand jobs)</b>
Resources	-325.865	Resources	-83.8198	Resources	-5.92
Construction	-20.4162	Construction	-8.22319	Construction	-0.18
Non-durables	118.3005	Non-durables	-17.0277	Non-durables	-0.27
Durables	-62.1843	Durables	-13.228	Durables	-0.21
TCU	-41.9099	TCU	-11.0729	TCU	-0.19
Trade	-60.965	Trade	-20.5863	Trade	-0.59
FIRE	-93.9854	FIRE	-24.2584	FIRE	-0.53
Services	-143.395	Services	-69.968	Services	-2.02
Government	-7.38669	Government	-4.11159	Government	-0.09
Total	-874.409	Total	-252.296	Total	-10.01
Direct	-283.643	Direct	-65.19	Direct	-4.95
Indirect	-590.765	Indirect	-187.106	Indirect	-5.06
(Multiplier)	(3.08)	(Multiplier)	(3.87)	(Multiplier)	(2.02)

The analysis suggests that job losses, in total, amounted to 10,000; however, these are the gross negative effects and do not include the positive stimulant effects that would have accompanied the expenditures generated from state and federal agencies to assist in the recovery. Much of the source of the job loss comes from loss of income — to the farm and non-farm communities — rather than through traditional ripple effects associated with firm displacements. It was also difficult to separate out the effects of the recession from those associated with the flood, although in preparing the analysis that is shown in Table 31, every attempt was made to target flood-related events. Further, some of the economic disruptions may turn out to have been temporary. For example, a plant may have ceased production for a short period of time only to resume and deliver products on order, albeit a little late. Hence, there is a suggestion that some of the disruptions may have more to do with timing rather than absolute losses.

## Conclusions

One of the great difficulties analysts face in conducting impact analysis of unexpected events is the assembly of information that can be used effectively in sophisticated analytical models. The problems in 2008 were compounded by the fact that the State's economy was entering a recession (some months behind the United States as a whole, since it is now thought that the national recession began in December 2007).

Several findings need to be highlighted:

- The short-term effects may not prove to be an accurate guide to the longer-term recovery prospects for a specific county that has been affected by the flood.
- The evidence from 1993 reveals significant resilience in the ability of most counties to recover — measured in terms of employment and migration.
- Given the different national and state context in 2008, with a major recession, it would be impossible to predict with any degree of accuracy whether the pattern of

rebound observed in the post 1993 flood would provide an accurate sense of expectations for the post 2008 flood period.

- Analyses need to be conducted at multiple spatial scales — county, groups of counties and the state — to gain a more complete picture of the impacts. There needs to be careful consideration about the appropriate spatial scale in which to present impacts — the physically affected area may not encompass the area of the economic impacts as it is highly likely that the latter area will be much more extensive.
- Careful thought should be given to the possibility of linking some of the qualitative analysis, particularly that focused on leadership and strategic recovery plans, with the quantitative analysis provided in this report. In essence, can a link be found between recovery trajectories that were more effective and different management patterns of relief effort, local coordination, and so forth?

## The ARIMA Model Used at the County Level

### *Procedure of Model Development*

In general, the model estimation of ARIMA consists of the following three stages:

1. Unit root test and identification of the order of difference, i.e.  $d$ . This preliminary step is essential to stabilize the time-series data and reduce the residual. The Augmented Dickey-Fuller (ADF) test is often employed for the analysis of the unit root, where the null hypothesis is that the input series has a unit root.
2. Estimation and diagnosis of the parameters of transfer function, i.e.  $p$  and  $q$ . The autocorrelation function (ACF), partial autocorrelation function (PACF) and cross-autocorrelation function (CACF) are important to tentatively estimate the parameters of transfer function, while statistical measures naturally provide statistical evidence to support the determination of an appropriate transfer function.
3. Residuals/ noise diagnostic check. The correlogram of Q-statistics based on the ACF and PACF of the residual is generally used for residual analysis.

### *Transfer Function and Univariate ARIMA Model*

The ARIMA model developed by Box and Jenkins (1976) has become popular due to its advantages of power and flexibility. Put simply, the general transfer function of ARIMA is of the following form:

$$Y_t = \sum [\omega(B)/\delta(B)]B^b X_t + [\theta(B)/\phi(B)]\varepsilon_t \quad (1)$$

where  $Y_t$  and  $X_t$  are the output and input series respectively,  $b$  is the time delay,  $\omega(B)/\delta(B)$  is the polynomial of the transfer function,  $[\theta(B)/\phi(B)]\varepsilon_t$  is the noise model, and  $\varepsilon_t$  is the noise.

By simplifying Equation (1), Equation (2) is obtained below:

$$Y_t = V(B)X_t + N_t \quad (2)$$

where  $V(B) = \delta^{-1}(B)\omega(B)B^b$ ,  $\omega(B) = \omega_0 - \omega_1 B - \dots - \omega_s B^s$ ,  $\delta(B) = 1 - \delta_1 B - \dots - \delta_r B^r$ , and  $N_t = [\theta(B)/\phi(B)]\varepsilon_t$ .

The univariate ARIMA model combines three components: Autoregressive (AR), Integration (I), and Moving Average (MA), therefore the general form of a univariate ARIMA model denoted as  $ARIMA(p,d,q)(P,D,Q)_s$  is defined as Equation (3), which is further simplified as Equation (4):

$$(1 - B)^d (1 - B^s)^D Y_t = [\theta_q(B)\Theta_Q(B^s) / \phi_p(B)\Phi_P(B^s)]\varepsilon_t \quad (3)$$

$$\nabla d \nabla D_s Y_t = [\theta_q(B)\Theta_Q(B^s) / \phi_p(B)\Phi_P(B^s)]\varepsilon_t \quad (4)$$

where  $p$ ,  $d$ , and  $q$  are the order of AR, I and MA terms respectively;  $P$ ,  $D$ , and  $Q$  are the order of the seasonal AR, I and MA terms respectively;  $\nabla d = (1 - B)^d$  and  $\nabla D_s = (1 - B^s)^D$  represent the regular and seasonal I operators respectively;  $\phi_p(B)$  and  $\Phi_P(B^s)$  are the nonseasonal and seasonal AR operators respectively;  $\theta_q(B)$  and  $\Theta_Q(B^s)$  are the nonseasonal and seasonal MA operators respectively; and  $\varepsilon_t$  is the disturbance or random order.

#### *ARIMA Model with Intervention Analysis*

An intervention model is of the general form:

$$Y_t = V(B)I_t + N_t \quad (5)$$

where  $I_t$  is an intervention or dummy variable that is defined as:

For short-term effects,  $I_t = 1$ , is thus defined for the occurrence of the flood hazards, and  $I_t = 0$  otherwise. For long-term effects,  $I_t = 1$  for all the years after the occurrence of the flood hazard (depending on how long we want to define as long term effects by truncating data to time periods of interest) and  $I_t = 0$  otherwise.

#### *Short term effect intervention:*

In our study, the seasonal effects are not considered and the data series of aggregated total employment for 18 flood-affected counties in Illinois are found to have a best fit for an ARIMA (1, 0, 1) model by using the procedure we specified in 5.2. Then, we run an ARIMA (1,0,1) model for the aggregated level of employment with a short term dummy variable (indicating the flood occurrence), and the results are reported below:



	<i>ar1</i>	<i>ma1</i>	<i>intercept</i>	<i>short-term effect</i>
	0.4478	0.5143	676074.7	9012.595
<i>s.e.</i>	0.1922	0.1583	3244.108	4701.938

*Long term effect intervention:*

In this case, the dummy variable is set to 1 after the occurrence of flood in our time series. In other words, the dummy variable = 1 for June, July, August and September 2008 in our data series. The ARIMA (1, 0, 1) model was then run to capture the long term effects:

	<i>ar1</i>	<i>ma1</i>	<i>intercept</i>	<i>long-term effect</i>
	0.4147	0.5187	675097.3	8600.938
<i>s.e.</i>	0.1934	0.1567	3298.24	6453.434

*Using both the short term effect and long term effect intervention:*

Next, the ARIMA (1, 0, 1) model was run with both the short term and long term effects:

	<i>ar1</i>	<i>ma1</i>	<i>intercept</i>	<i>short-term effect</i>	<i>long-term effect</i>
	0.4403	0.5172	675940.9	8472.201	1081.429
<i>s.e.</i>	0.2013	0.1592	3389.838	6455.254	8819.025

*Use the Lagged Monthly Employment as Control Case*

In an attempt to address this concern above, the value of a one month lag employment was used as a control variable and this was incorporated into the ARIMA model.

$$Y_t - Y_{t-1} = V(B)I_t + N$$

Meanwhile, considering that we only have a limited time series data (three more monthly employment information after the hit of the flood in each county), only one dummy variable was used to specify the effects of the flood on the employment level for the following three months after the flood (what may be referred to as the flood effects).

After fitting values of  $Y_t - Y_{t-1}$  into the ARIMA model, we obtain ARIMA (0, 0, 0) system and the regression results are reported as follows:

	<i>intercept</i>	<i>Flood Effects</i>
	1202.357	-2995.857
<i>s.e.</i>	1604.604	4538.496

Here, the results verify that the effects of flood cast a negative influence on the overall aggregated employment level of the 18 affected counties in Illinois.

#### *County-level ARIMA Models, and Flood Effects*

At the aggregated level of the 18 affected counties in Illinois under the flood of June 2008, if it was manageable to control the possible noise effects on employment by differencing the time series monthly employment levels, the ARIMA results clearly reveal a negative effect on employment due to the flood. Nevertheless, due to the fact that the model operates with a limited time series data for employment after the flood, and also at the aggregated level of analysis a lot of specific county-level features are lost due to aggregation, it was considered important to conduct ARIMA tests for each of the 18 flood affected counties in Illinois state. Results are reported in Table 27.

**Table A1: ARIMA Analysis for Employment for 18 Flood Affected Counties in Illinois in 2008**

		<i>ARIMA (p, d, q)</i>	<i>AR(1)</i>	<i>MA(1)</i>	<i>MA(2)</i>	<i>MA(3)</i>	<i>Intercept</i>	<i>Flood Effects</i>
<b>NORTH</b>	<i>Winnebago</i>	ARIMA(0,0,0)	--	--	--	--	166.321	-498.821
	<i>Lake</i>	ARIMA(0,0,1)	--	0.256	--	--	742.882	-1296.534
	<i>Whiteside</i>	ARIMA(0,0,0)	--	--	--	--	29.786	-48.536
	<i>Rock Island</i>	ARIMA(0,0,0)	--	--	--	--	137.107	-274.357
	<i>Mercer</i>	ARIMA(0,0,0)	--	--	--	--	6.929	-5.429
<b>WEST</b>	<i>Henderson</i>	ARIMA(0,0,1)	--	-0.598	--	--	4.459	-14.886
	<i>Hancock</i>	ARIMA(1,0,1)	0.485	-1.000	--	--	-3.391	-26.217
	<i>Adams</i>	ARIMA(0,0,0)	--	--	--	--	47.214	-210.714
	<i>Jersey</i>	ARIMA(1,0,0)	0.286	--	--	--	23.151	-85.702
	<i>Calhoun</i>	ARIMA(0,0,0)	--	--	--	--	2.393	1.107
	<i>Douglas</i>	ARIMA(0,0,0)	--	--	--	--	5.964	-24.714
	<i>Edgar</i>	ARIMA(0,0,0)	--	--	--	--	-6.429	-33.571
<b>EAST</b>	<i>Coles</i>	ARIMA(0,0,0)	--	--	--	--	-42.643	150.143
	<i>Cumberland</i>	ARIMA(0,0,0)	--	--	--	--	8.786	-24.536
	<i>Jasper</i>	ARIMA(1,0,1)	-0.390	0.749	--	--	3.679	-36.038
	<i>Clark</i>	ARIMA(0,0,0)	--	--	--	--	0.286	-39.786
	<i>Crawford</i>	ARIMA(0,0,3)	--	-0.032	-0.504	-0.464	8.118	4.229
	<i>Lawrence</i>	ARIMA(1,0,2)	0.216	0.206	0.190	--	-3.650	-46.251

From these results, most of county level  $Y_t - Y_{t-1}$  time series fall into the category of ARIMA (0, 0, 0), and from the coefficients estimated for the dummy variable of flood effects, they all carry the expected negative sign except for Calhoun, Coles and Crawford Counties. The negative values estimated for flood effects show the predicted decrease of employment due to the flood for each specific county under the ARIMA time series model. On the other hand, the positive values for the above three counties indicate that according to the ARIMA model, the employment in these counties experiences a positive increase under the effect of flooding. Instead of suffering employment loss due to the flood, these three counties attracted more jobs in the medium run very probably due to the employment devoted to the reconstruction of the damage.

### *Migration Analysis*

**Table A2: ARIMA results for in-migration rate in Illinois counties**

<i>County</i>	<i>ARIMA</i>	<i>AR(1)</i>	<i>AR(2)</i>	<i>AR(3)</i>	<i>MA(1)</i>	<i>Intercept</i>	<i>Short-Run Flood Effects</i>	<i>Long-Run Flood Effects</i>
<i>Alexander</i>	ARIMA(2,0,0)	-0.662	-0.320	--	--	-0.070	-1.254	0.639
<i>Brown</i>	ARIMA(0,0,0)	--	--	--	--	-0.108	-2.036	0.973
<i>Calhoun</i>	ARIMA(3,0,0)	-1.065	-1.060	-0.586	--	-0.012	-0.079	0.213
<i>Cass</i>	ARIMA(0,0,0)	--	--	--	--	-0.153	1.220	-0.155
<i>Greene</i>	ARIMA(1,0,0)	-0.607	--	--	--	-0.113	1.089	0.047
<i>Jackson</i>	ARIMA(1,0,0)	-0.679	--	--	--	-0.027	0.583	-0.286
<i>Jersey</i>	ARIMA(0,0,0)	--	--	--	--	-0.030	-0.509	0.235
<i>Madison</i>	ARIMA(0,0,0)	--	--	--	--	0.018	0.093	-0.027
<i>Monroe</i>	ARIMA(1,0,0)	-0.520	--	--	--	-0.018	0.220	-0.104
<i>Morgan</i>	ARIMA(0,0,0)	--	--	--	--	-0.035	0.153	0.092
<i>Pike</i>	ARIMA(0,0,1)	--	--	--	-1.000	-0.093	0.294	0.060
<i>Randolph</i>	ARIMA(0,0,0)	--	--	--	--	0.034	1.442	-0.364
<i>St. Clair</i>	ARIMA(0,0,0)	--	--	--	--	-0.033	-1.115	0.038
<i>Scott</i>	ARIMA(0,0,1)	--	--	--	-1.000	-0.066	3.088	-0.830
<i>Union</i>	ARIMA(0,0,0)	--	--	--	--	-0.141	-0.676	0.387

**Table A3: ARIMA results for out-migration rate in Illinois Counties**

<i>County</i>	<i>ARIMA</i>	<i>AR(1)</i>	<i>AR(2)</i>	<i>AR(3)</i>	<i>MA(1)</i>	<i>Intercept</i>	<i>Short-Run Flood Effects</i>	<i>Long-Run Flood Effects</i>
<i>Alexander</i>	ARIMA(1,0,0)	-0.653	--	--	--	-0.017	0.035	0.200
<i>Brown</i>	ARIMA(1,0,0)	-0.850	--	--	--	-0.181	-1.099	0.755
<i>Calhoun</i>	ARIMA(2,0,0)	-0.941	-0.639	--	--	-0.117	3.154	-0.797
<i>Cass</i>	ARIMA(1,0,0)	-0.500	--	--	--	-0.043	0.015	0.089
<i>Greene</i>	ARIMA(1,0,0)	-0.525	--	--	--	-0.031	1.138	-0.029
<i>Jackson</i>	ARIMA(0,0,0)	--	--	--	--	-0.032	0.965	-0.145
<i>Jersey</i>	ARIMA(1,0,0)	0.001	--	--	--	-0.032	0.965	-0.146
<i>Madison</i>	ARIMA(0,0,0)	--	--	--	--	-0.012	0.172	0.052
<i>Monroe</i>	ARIMA(2,0,0)	-0.480	-0.828	--	--	-0.057	1.621	-0.492
<i>Morgan</i>	ARIMA(0,0,1)	--	--	--	-1.000	-0.056	0.549	0.023
<i>Pike</i>	ARIMA(1,0,0)	-0.236	--	--	--	-0.057	1.566	-0.321
<i>Randolph</i>	ARIMA(0,0,0)	--	--	--	--	-0.003	-0.344	0.176
<i>St. Clair</i>	ARIMA(0,0,0)	--	--	--	--	-0.095	-0.148	0.172
<i>Scott</i>	ARIMA(0,0,0)	--	--	--	--	0.020	0.533	-0.196
<i>Union</i>	ARIMA(0,0,1)	--	--	--	-1.000	-0.046	0.223	-0.012

**Table A3: ARIMA results for net-migration rate in Illinois Counties**

<i>County</i>	<i>ARIMA</i>	<i>AR(1)</i>	<i>AR(2)</i>	<i>MA(1)</i>	<i>MA(2)</i>	<i>Intercept</i>	<i>Short-Run Flood Effects</i>	<i>Long-Run Flood Effects</i>
<i>Alexander</i>	ARIMA(1,0,0)	-0.682	--	--	--	-0.083	-1.290	0.537
<i>Brown</i>	ARIMA(1,0,0)	-0.773	--	--	--	0.088	-0.219	-0.531
<i>Calhoun</i>	ARIMA(0,0,1)	--	--	-1.000	--	0.074	-5.777	1.597
<i>Cass</i>	ARIMA(1,0,0)	-0.502	--	--	--	-0.104	1.262	-0.232
<i>Greene</i>	ARIMA(1,0,0)	-0.556	--	--	--	-0.029	0.820	-0.155
<i>Jackson</i>	ARIMA(1,0,0)	-0.674	--	--	--	-0.067	-0.886	0.132
<i>Jersey</i>	ARIMA(0,0,0)	--	--	--	--	0.003	0.606	0.197
<i>Madison</i>	ARIMA(0,0,1)	--	--	-1.000	--	0.059	-2.855	0.778
<i>Monroe</i>	ARIMA(0,0,1)	--	--	-1.000	--	0.044	0.266	-0.035
<i>Morgan</i>	ARIMA(1,0,0)	-0.415	--	--	--	-0.023	-0.095	0.073
<i>Pike</i>	ARIMA(0,0,2)	--	--	-1.918	1.000	-0.092	-0.066	0.127
<i>Randolph</i>	ARIMA(1,0,0)	-0.763	--	--	--	0.214	2.650	-1.175
<i>St. Clair</i>	ARIMA(2,0,0)	-0.786	-0.419	--	--	0.082	-4.266	0.832
<i>Scott</i>	ARIMA(0,0,1)	--	--	--	-1.000	-0.005	3.377	-1.101
<i>Union</i>	ARIMA(1,0,0)	-0.298	--	--	--	-0.093	-1.720	0.311

# Chapter IV

## Regional Focus Group Meetings



Long Term Recovery Council  
**FINAL REPORT**

## CHAPTER IV – REGIONAL LISTENING SESSIONS

### *Communication. Coordination. Planning. Prevention.*

These are a few of the themes that emerged from the four regional listening sessions held throughout Illinois between February and March 2009. The cities of Quincy, Collinsville, Casey, and Rock Island played host to local officials, stakeholders, emergency managers, non-profits, community members, and many others to discuss the impact the 2008 floods have had on the affected counties.

In total, over 500 people were invited to the four listening sessions, with about 150 in total participating. The listening sessions were coordinated and facilitated by University of Illinois Extension, with assistance provided by the four Regional Co-Chairs (Mayor John Spring, City of Quincy; Allan Dunstan, President, Madison County Board; Terry Bruce, CEO Illinois Eastern Community Colleges; and Jim Bohnsack, Chairman of Rock Island County), University of Illinois Office of Sustainability, and the Department of Commerce and Economic Opportunity.

While each area of the State is unique in its make-up and recovery efforts, several themes emerged throughout all four listening sessions, regardless of the severity of impact experienced by the affected counties. One of these themes focused on the need for maximizing regional solutions through regional planning. Destruction from disasters does not stop neatly at county or other jurisdictional borders. While sources of funding may be appropriated to projects or stakeholders within traditional boundaries, economic developers must consider the ensemble of effects that policy decisions have on entire regions. A nation's competitiveness in the global marketplace is contingent upon the strength of its regional economies. Therefore, the recognition and determination of regions is imperative. Listening session participants recognized the need for blurring existing jurisdictional boundaries to look at planning from a watershed perspective. This strategy would provide the best possible scenarios for long-term flood mitigation. Planning as a region would ensure steps are taken to protect and preserve critical infrastructure, as well as allow for appropriate use of conservation practices and creation of open spaces for flood easement.

A second theme that emerged was the recognition that planners and emergency managers must interact and communicate more in planning and implementing hazard mitigation. As hazard mitigation plans are created, identified stakeholders from throughout the region should be part of the creation process. Most hazard mitigation involves some element of land use or other planning activities, such as economic development, transportation, and historic preservation. Comprehensive Economic Development Strategies (CEDS) present a great opportunity for reducing the vulnerability to flood damages and economic disruption for businesses within the floodplain.

A third theme that emerged was the need for greater investment in building local response capacity, particularly at the rural level. The lack of resources can cause rural communities to struggle potentially more than their urban counterparts with a disaster

recovery. Both the resource base for funding and the volunteer support to the flood event are typically reduced because of the rural nature. Gaining access to state and federal resources can be difficult for rural communities because local units of government often have problems in locating matching funds. The situation is compounded by the widespread nature of flooding in the region, which causes federal agency offices to empty and strains the capacity of support organizations to meet the needs of urban and rural communities at the same time.

Participants pointed to a need for a full-time professional with appropriate training as a necessary long-term critical investment. Currently in rural areas (in particular), they have part-time or, in some situations, volunteer Emergency Management Officers who are not adequately prepared to deal with the serious complexity presented in a disaster situation. Agencies and communities would benefit a great deal from investments in training to utilize incident command structures and building local relationships with federal and state agencies.

The lack of access to adequate technology can also hamper a community's efforts in access to, and sharing of, information before, during and after a flood event. Enhanced investments in broadband technologies are essential to providing efficient coordination of disaster response and recovery. Investments in broadband technologies are critical to building local capacity for prompt and effective disaster recovery. Technology infrastructure can play a significant role in managing information and assisting in coordination between federal, state, and local agencies and organizations.

At each of the listening sessions, there was an awareness of the great amount of critical public infrastructure residing in floodplains. It was suggested many times that every possible effort should be made to reduce the vulnerability of flood damages to roads, bridges, public wells, water supplies and sewage treatment facilities. With limited resources to upgrade infrastructure, regions will be challenged to identify which investments provide the greatest public good.

What follows is a breakdown of the process, comments, suggestions, and discussions held at each of the four listening sessions. No identifying information was recorded as to who specifically said what in an effort to encourage open and honest participation and communication. Members who attended the sessions did so either due to where they work or where they live, sometimes because of both. It was readily apparent that all were greatly invested in long-term recovery efforts for their communities and interested in looking at ways to mitigate future flooding events.

Participants provided the following recommendations for Critical Investments to reduce the level of economic disruption and flood damages while building economic resiliency.

1. **Protect community infrastructure.** A great deal of public infrastructure resides in floodplains. Roads, bridges, well heads, sewer treatment facilities, levees, pumps, and municipal water filtration plants and facilities located in the

floodplain should be adequately monitored, protected and/ or elevated to prevent future damage or disruption of services.

2. **Focus on regional land use planning.** Beginning by mapping out current business uses, critical infrastructure, natural and artificial storage, and public and private levees located within floodplains and watersheds. Utilize the information to develop plans which will give full consideration to all possible alternatives for vulnerability reduction. Planning assistance may be needed to increase access to geographic information and planning resources. The planning model created in southwest Illinois, presents a comprehensive view of floodplain management. They took a regional approach to address this problem. The Southwestern Illinois Flood Prevention Initiative report can be found at the following website: [www.swillinoislevees.com/html/technicalinfo.htm](http://www.swillinoislevees.com/html/technicalinfo.htm).
3. **Provide greater investment in soil and water conservation efforts** to create additional natural and artificial storage. Participants frequently commented on the importance of managing tributaries as a key preventative strategy. The creation of strategically placed reservoirs and stream bank stabilization were also noted as key investments in prevention. These investments in conservation practices were noted by both urban and rural participants.
4. **Increase levee reliability and safety.** Concerns expressed regarding levee reliability and safety echo concerns at the state and national levels. Levees throughout the state were built in the 1950s and are not acceptable by today's standards. Levee concerns and the importance of levees in protecting people, infrastructure, and business were discussed in each of the small group discussions. Many issues are linked to levee reliability and safety.
5. **Increase Investment in Enhanced Communication Systems:** Adequate communication systems are necessary to ensure the highest levels of safety and protection, efficiency of operations, coordination of efforts, distribution of aid, and recovery. This goal requires significant investment in development of statewide broadband infrastructure.
6. **Develop a comprehensive and systematic educational outreach program.** Emergency management directors, floodplain managers, drainage districts, local officials, and VOADS (voluntary organizations active in disaster situations) would benefit from access to training opportunities. While the primary goal for the training would be to improve floodplain management practices and disaster recovery, training programs also present a great opportunity for enhanced communication among local, state and federal agencies. Investment in education is a critical investment in lessening the economic disruption of disasters.
  - a. A key message that has significant economic implications for communities and individuals revolved around developing a greater understanding of the National Flood Insurance Program (NFIP)

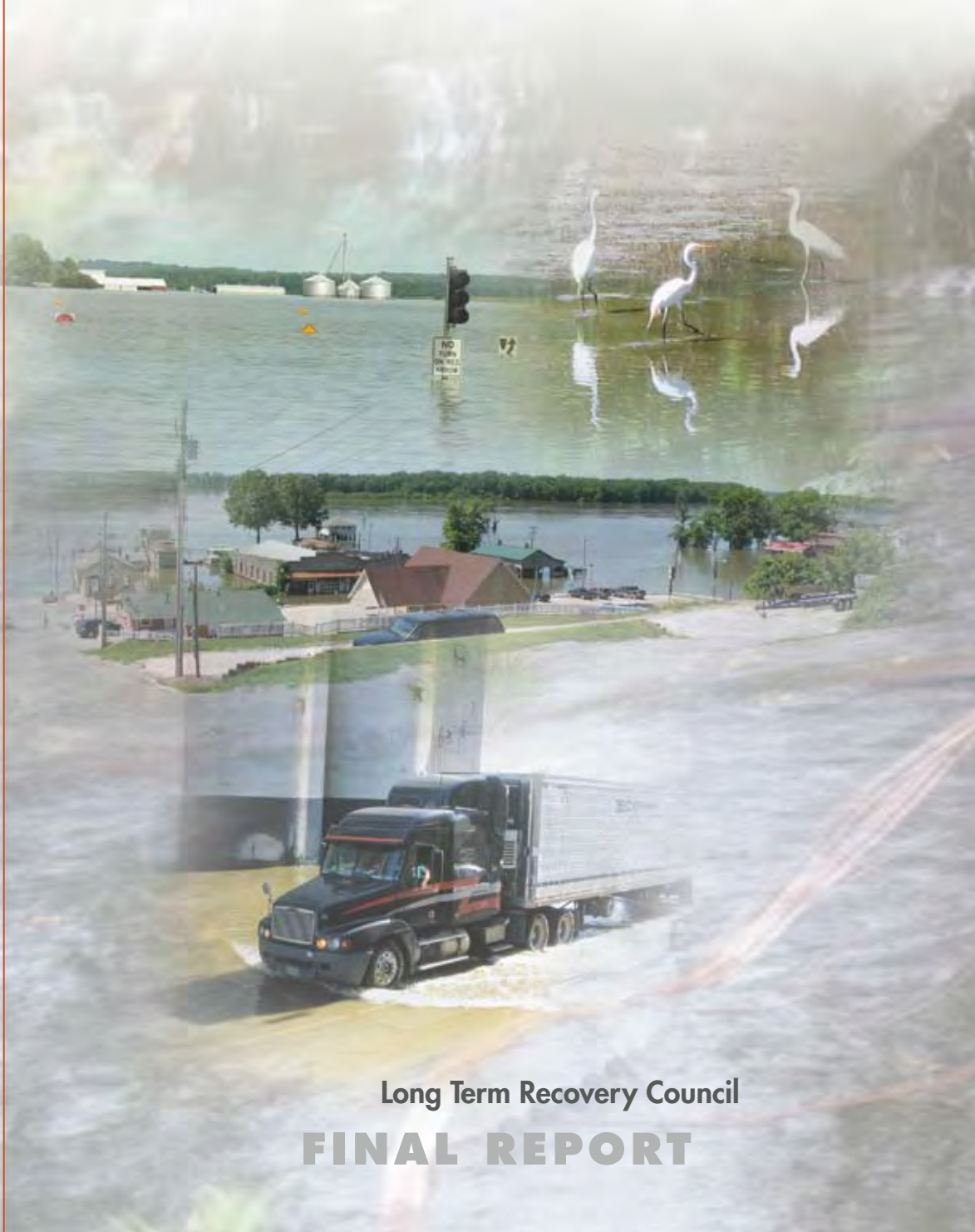


Community Rating System. Local actions can have a significant impact on NFIP rates for business and individuals.

- b. ***Business disaster planning*** training is another area that could yield significant benefits.
7. **Allocate state funding.** In addition to federal dollars, state funding is needed to ensure rapid response, coordinate clean-up after disasters, support targeted areas not included in federal disaster declarations, and provide matching dollars for federal funding in areas of greatest need.
8. **Provide assistance to local units of government in identifying long-term solutions and funding.**

# Chapter V

## High-Level Recommendations To The Governor



Long Term Recovery Council  
**FINAL REPORT**

## Section A

### Actions Needed to Address Needs Left Unmet by Federal Disaster Assistance Programs



Long Term Recovery Council  
**FINAL REPORT**

## CHAPTER V – SECTION A: ACTIONS NEEDED TO ADDRESS NEEDS LEFT UNMET BY FEDERAL DISASTER ASSISTANCE PROGRAMS

*The following is information gathered for the “Floodplain Management Resource Guide – Tools and Resources to Assist Illinois Communities in Planning, Response, and Recovery. July 2009”*

### **Introduction**

The purpose of this section is to provide a resource of floodplain management funding opportunities and technical assistance programs available to local communities in Illinois. Many of the organizations and programs listed in this chapter can help communities in their efforts to reduce flood risks while others can provide assistance with recovery efforts. This list serves as a reference to the numerous resources available for floodplain management activities.

The resources are organized into four categories of sources- federal agencies, state agencies, other public or non-profit organizations, and private/foundational organizations. Agencies and organizations are listed alphabetically by category.

*\*Communities are encouraged to contact each organization for specific information on programs, as they have the tendency to change in terms of availability and requirements.*

We would like to specifically thank Keith Eichorst and Paul Osman for their work in drafting the first edition of the guide in 2002. Keith, a community planner with the Natural Resources Conservation Service (NRCS), provided the initial template and idea through a publication entitled “Grant Information Summary for Conservation Projects.” Paul, a manager at the Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR), expanded on this information by including a wide variety of flood-related technical assistance and grant opportunity programs.

While an effort has been made to provide an accurate listing, funding information is constantly changing and omissions or errors may occur.

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**Illinois ResourceNet: A Funding Access Initiative** (IRN) is a university-based resource providing Illinois nonprofits and local governments with the competitive assets to access federal funding. IRN offers organizations a unique approach to grant access centered on providing information and resources on an interactive website, working with experienced technical assistants on designing high caliber proposals, and connecting with a diverse group of partners to meet proposed project goals.

Illinois ResourceNet is committed to ensuring that the organizations we work with are ready for the rigor and challenges of managing a federal grant. With this in mind, our technical assistance services have been designed to facilitate the process and improve the quality of proposals through a review, critique, and advisory process.

Organizations currently working on or in the planning stages for a Federal RFP please send an email to [info@illinoisresource.net](mailto:info@illinoisresource.net) to request technical assistance.

## **Federal Sources**

The federal government is an excellent place to investigate sources of assistance for water resources projects.

Once you identify your specific requirements, the Catalog of Federal Domestic Assistance (CFDA) is a great place to search for federal funding sources. The catalog can be searched online and should also be available at your local library in print form.

[www.cfda.gov](http://www.cfda.gov)

Grants.gov is the place for finding and applying for federal government grants. Forms and grant administration procedures can also be found on the website.

[www.grants.gov](http://www.grants.gov) | [support@grants.gov](mailto:support@grants.gov) (Grants Program Mgmt. Office)  
(800) 518-4726 (Contact Center)

You can learn more about the American Recovery and Reinvestment Act of 2009 (ARRA, also known as the “Economic Stimulus Package”) at [Recovery.gov](http://Recovery.gov). It enables you to browse and search opportunities specifically through the Recovery Act (via [grants.gov](http://grants.gov)). Allocation information is also provided and there is a website dedicated to Illinois recovery efforts.

[www.recovery.gov](http://www.recovery.gov) | [www.illinois.gov/recovery](http://www.illinois.gov/recovery)

Federal agencies are listed alphabetically by department, with contact information listed below each agency. Please note that different programs offered by the same agency may have separate contact information. Websites of federal agencies may give you more information about individual programs and provide information on other opportunities for assistance.

## **U.S. Dept. of Agriculture (USDA)**

### **Natural Resources Conservation Service (NRCS)**

Natural Resources Conservation Service | 2118 W. Park Court | Champaign, IL 61820  
(217) 353-6600 | [www.nrcs.usda.gov](http://www.nrcs.usda.gov)

Topics: Public Information, Floodplain Planning, Emergency Management Planning, Multi-Objective Management, Mitigation Techniques.

NRCS primarily serves rural areas. NRCS staff provides information on land use planning, conservation planning, resource development, water management and flood prevention to farmers, community officials, and land developers. NRCS provides general information, as well as technical and financial assistance, for flood and stream bank protection projects, emergency watershed assistance, and conservation easements in floodplain areas.

## **Rural Development**

USDA Rural Development | Illinois State Office | 2118 W. Park Ct., | Champaign, IL 61821  
(217) 403-6200 | [www.rurdev.usda.gov/il](http://www.rurdev.usda.gov/il)

USDA Rural Development in Illinois operates federal loan programs designed to strengthen rural businesses, finance new and improved rural housing, develop community facilities, and support development of water and waste disposal systems, telecommunications, and utilities. Rural Development provides financing for over 35 programs that serve people in rural Illinois through guaranteed loans, direct loans, and grants. Programs are delivered through offices in 12 locations as well as the state office in Champaign.

## **Farm Service Agency (FSA)**

Illinois State FSA Office | 3500 West Wabash | Springfield, Illinois 62711  
217-241-6600 x. 2 | [www.fsa.usda.gov](http://www.fsa.usda.gov)

Farm Service Agency provides cost sharing assistance to agricultural producers who have suffered severe damage to farmland as a result of a natural disaster.

ECP is implemented only after a determination that damage to the land is so severe that federal assistance is needed to return the land to productive agricultural use. This determination is done locally by FSA's County Committees. For more information, contact your local FSA office following a disaster.

## **U.S. Department of Commerce**

### **Economic Development Administration**

Chicago Regional Office | 111 North Canal Street, Suite 855 | Chicago, IL 60606  
(312) 353-7706 | [www.eda.gov](http://www.eda.gov)

Illinois EDA Representative: William Warren | (312) 353-7148, ext. 158 |  
[wwarren1@eda.doc.gov](mailto:wwarren1@eda.doc.gov)

The Economic Development Administration (EDA) was established under the Public Works and Economic Development Act of 1965 (42 U.S.C. § 3121), as amended, to generate jobs, help retain existing jobs, and stimulate industrial and commercial growth in economically distressed areas of the United States. EDA assistance is available to rural and urban areas of the Nation experiencing high unemployment, low income, or other severe economic distress.

In fulfilling its mission, EDA is guided by the basic principle that distressed communities must be empowered to develop and implement their own economic development and revitalization strategies. EDA works in partnership with state and local governments, regional economic development districts, public and private nonprofit organizations, and Indian tribes to utilize these strategies. EDA helps distressed communities address problems associated with long-term economic distress, as well as sudden and severe economic dislocations including recovering

from the economic impacts of natural disasters, the closure of military installations and other Federal facilities, changing trade patterns, and the depletion of natural resources.

The EDA provides supplemental funding to communities associated with disasters for the following purposes. EDA intends to award investments for expenses related to disaster relief, long-term recovery, and restoration of infrastructure related to the consequences of hurricanes, floods and other natural disasters, for which the President declared a major disaster under title IV of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. § 5121 *et seq.*) (the “Stafford Act”). Through this competitive solicitation, EDA seeks to fund planning (i.e., strategy grants) and implementation investments that generate new employment opportunities for regions suffering economic distress in the form of high unemployment, underemployment, low per capita incomes, and outmigration due to the natural disasters. The Economic Adjustment Assistance program can provide a wide range of technical, planning and infrastructure assistance. This program is designed to respond adaptively to pressing economic recovery issues and is well suited to help address the challenges faced by the regions affected by the hurricanes, floods and other natural disasters of 2008. EDA’s economic development activities encourage business growth and increased business establishment, retention and expansion, and help create jobs.

### **National Oceanic and Atmospheric Association (NOAA)**

14th Street & Constitution Avenue, NW | Room 6217 | Washington, DC 20230  
(202) 482-6090 | [www.nws.noaa.gov](http://www.nws.noaa.gov)

Topic: Emergency Management Planning.

Reports the weather of the U.S. and its possessions and provides weather and river forecasts; Issues watches and warnings to the general public against natural events, such as hurricanes, tornadoes, severe thunderstorms, floods, and tsunamis; Provides special services in support of aviation, marine activities, agriculture, forestry, urban air-quality control, and other weather-sensitive activities.

Point of Contact: There are 13 River Forecast Centers across the United States and Alaska. Regional office staff can identify field stations near a user.

National Weather Service Central Region Headquarters\*  
7220 NW 101st Terrace | Kansas City, MO 64153  
(816) 891-7734 | [www.crh.noaa.gov/crh](http://www.crh.noaa.gov/crh)

\*Manages the NWS Weather Forecast Offices and River Forecast Centers in the following states: Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, Wisconsin, and Wyoming.

## **U.S. Department of Defense (DOD)**

### **U.S. Army Corps of Engineers (USACE)**

Within Illinois, the U.S. Army Corps of Engineers is represented in four district offices:

Chicago District- [www.lrc.usace.army.mil](http://www.lrc.usace.army.mil)

Rock Island District- [www.mvr.usace.army.mil](http://www.mvr.usace.army.mil)

St. Louis District- [www.mvs.usace.army.mil](http://www.mvs.usace.army.mil)

Louisville District- [www.lrl.usace.army.mil](http://www.lrl.usace.army.mil)

\*Please refer to the USACE website to determine which district you are located in:

[www.usace.army.mil/about/Pages/Locations.aspx](http://www.usace.army.mil/about/Pages/Locations.aspx)

Topics: Public Information, Data Sources, Floodplain Management Planning, Mitigation Techniques, Emergency Management Planning, Project Construction.

The U.S. Army Corps of Engineers (USACE) is the nation's primary water resources development agency. Congress assigned the Corps with this civil works responsibility focused on protecting and enhancing our county's aquatic systems. Since 1824, the Corps has been involved in developing commercial navigation and recreation, reducing flood damage, and restoring ecosystems. The USACE Districts work with partners and stakeholders in planning, engineering, design, and construction of these water resource projects.

### **Illinois Flood Risk Management Team:**

The Illinois Flood Risk Management Team was implemented to further develop and improve interagency coordination of flood risk management. Through this team, state agencies work with USACE, FEMA, and other federal and local agencies to ensure continuous interagency collaboration at the state level, leveraging available resources and information. The program has created a mechanism to collaboratively solve flood hazard issues and also recommend and implement solutions while increasing and improving flood risk communication and outreach. The Flood Risk Management Team facilitates strategic life-cycle planning to reduce flood risk and provide assistance in implementing state-identified high-priority actions. Individuals and organizations may contact this group to obtain assistance in identifying appropriate agency programs and processes to address their flood damage and risk issues.

\*Local USACE contact for the Flood Risk Management Team:

Hank DeHaan, Program Manager

U.S. Army Corps of Engineers | Rock Island District

Clock Tower Building | P.O. Box 2004 | Rock Island, IL 61204-2004

(309) 794-5853

## **U.S. Department of Energy**

U.S. Department of Energy | Chicago Regional Office | 9800 S Cass Ave. | Argonne, IL 60439  
(630) 252-2423 | [www.ch.doe.gov](http://www.ch.doe.gov)

Topics: Land Use Planning, Disaster Planning.



## **Sustainable Development**

The DoE provides a very detailed web site with volumes of information on community planning, land use planning, disaster planning, and sustainable development. On this website, you will be able to:

- Read about other communities that have discovered the benefits of sustainable development;
- Locate technical and financial resources that can help your community plan and carry out sustainable development projects; and
- Access model codes and ordinances other communities have used to implement sustainable development.

## **U.S. Department of Health and Human Services**

### **Administration for Children and Families (ACF)**

ACF Chicago Regional Office | 233 N. Michigan Avenue, Suite 400 | Chicago, IL 60601  
(312) 353-4237 | [www.acf.hhs.gov/index.html](http://www.acf.hhs.gov/index.html)

The Administration for Children and Families (ACF) is a federal agency funding state, territory, local, and tribal organizations to provide family assistance (welfare), child support, child care, Head Start, child welfare, and other programs relating to children and families. Actual services are provided by state, county, city and tribal governments, and public and private local agencies. ACF assists these organizations through funding, policy direction, and information services.

Community Services Block Grant (CSBG)/Rural Community Development Facilities Program (RCDFP)/ Homeland Security Program: Water and Wastewater Treatment Systems Safety and Security Training and Technical Assistance Project

The Office of Community Services awards this grant (contingent upon available funding) to provide nationwide training and technical assistance to small, rural communities. The project will address concerns of many small and very small community water and wastewater treatment systems that may be most vulnerable to possible terrorist attacks and least prepared to deal with such events.

[www.acf.hhs.gov/grants/open/HHS-2009-ACF-OCS-EF-0025.html](http://www.acf.hhs.gov/grants/open/HHS-2009-ACF-OCS-EF-0025.html)

## **U.S. Department of Homeland Security**

### **Federal Emergency Management Agency (FEMA)**

#### **National Flood Insurance Program (NFIP)**

Federal Emergency Management Agency (FEMA)

Region V Flood Insurance and Mitigation Division | 536 South Clark Street | Chicago, IL 60605  
(312) 408-5500 | [www.fema.gov](http://www.fema.gov)

Topics: Floodplain Management, Floodplain Mapping, Risk Assessment, Mitigation Planning, Mitigation Techniques.

FEMA Region V has a division that handles the administration of the National Flood Insurance Program (NFIP), mitigation programs, and helps states, communities, and private entities interpret the federal regulations.

## **U.S. Dept. of Housing and Urban Development (HUD)**

Chicago Regional Office (Region V) | 77 W. Jackson Blvd. | Chicago, IL 60604  
(312) 353-5680 | TTY (312) 353-7143 | [www.hud.gov](http://www.hud.gov)

Springfield Local Office | 500 W. Monroe, 1SW | Springfield, IL 62704  
(217) 492-4120 | TTY (217) 492-4101 | [www.hud.gov/local/index.cfm?state=il](http://www.hud.gov/local/index.cfm?state=il)

HUD offers mortgage insurance programs, alternative housing options, grants, and many other types of assistance for people affected by a disaster. People needing to rent housing may get assistance from HUD's National Housing Locator System ([portal.hud.gov/app\\_nhls](http://portal.hud.gov/app_nhls)) which is a database that provides information on available housing (by location, number of bedrooms, rent, etc.). HUD staff and participating public housing agencies will assist disaster victims in obtaining information on available rental units. For individuals personally affected by a disaster and requiring permanent housing assistance, HUD offers the following:

## **U.S. Department of the Interior**

### **United States Geological Survey (USGS)**

Illinois Water Science Center | 1201 W University, Suite 100 | Urbana, IL 61801  
(217) 334-0037 | [www.usgs.gov](http://www.usgs.gov) | [il.water.usgs.gov](http://il.water.usgs.gov)

Topics: Data Sources, Emergency Management Planning.

As part of the Water Resources discipline of the U.S. Geological Survey, the Illinois Water Science Center is an integral part of a Federal agency devoted to data collection, applied science, scientific research, and dissemination of information. The USGS performs surveys, investigations and research, covering topography, geology, hydrology, biology, and the mineral resources of the United States. They classify lands as to their mineral water resources and publish and disseminate data relative to the foregoing activities. The USGS also publishes flow rates, and peak flows of certain streams and rivers.

### **National Park Service (NPS)**

National Park Service Headquarters | 1849 C Street NW | Washington, DC 20240  
(202) 208-6843 | [www.nps.gov](http://www.nps.gov)

The objectives of the National Park Service are to administer the properties under its jurisdiction, to protect the natural environment of the areas, and to assist States, local governments, and citizen groups in the development of park areas, the protection of the natural environment, and

the preservation of historic properties.

### **U.S. Fish and Wildlife Service (FWS)**

Great Lakes - Big River Region | 1 Federal Drive | BHW Federal Building | Fort Snelling, MN 55111 | (612) 713-5360 | [www.fws.gov/midwest](http://www.fws.gov/midwest)

Topics: Multi-Objective Management, Mitigation Techniques.

The mission of the U.S. Fish and Wildlife Service is to work with others to conserve, protect, and enhance fish and wildlife and their habitats for the continuing benefit of the American people. Their major responsibilities are: migratory birds, endangered species, freshwater and anadromous fish, the National Wildlife Refuge System, wetlands, conserving habitat, and environmental contaminants.

Relative to floodplain management and flood risk reduction, the Fish and Wildlife Service provides expertise and some cost share funding for the protection and restoration of fish and wildlife and their habitats. They also work with the aquatic and terrestrial development programs of other federal agencies, such as the Corps of Engineers and USDA Natural Resources Conservation Service. They also review water and wetland projects regulated by the U.S. Army Corps of Engineers' Section 10/404 permit program and provide technical assistance to FEMA.

Point of Contact (for the following three programs):

<http://offices.fws.gov/directory/listofficestate.cfm>

## **U.S. Department of the Treasury**

### **Internal Revenue Service (IRS)**

Chicago Office | 230 S. Dearborn St. | Chicago, IL 60604 | (312) 566-4912 |  
Springfield Office | 3101 Constitution Dr. | Springfield, IL 62704 | (217) 862-6015

There are numerous tax credits available that are unique to each taxpayer's situation. Please consult your local office (where you can meet with an IRS representative without an appointment) for specifics about which credits may be applicable. Also included below are some links to information about federal tax relief for taxpayers affected by the 2008 floods.

-List of local offices and contact information:

[www.irs.gov/localcontacts/article/0,,id=98273,00.html](http://www.irs.gov/localcontacts/article/0,,id=98273,00.html)

-Tax law changes related to Midwestern disaster areas (publication 4492-B):

[www.irs.gov/newsroom/article/0,,id=203082,00.html](http://www.irs.gov/newsroom/article/0,,id=203082,00.html)

-Information for Affected Taxpayers in the Midwestern Disaster Areas:

[www.irs.gov/pub/irs-pdf/p4492b.pdf](http://www.irs.gov/pub/irs-pdf/p4492b.pdf) (Heartland Disaster Tax Relief Act of 2008)

-Special toll-free number for tax issues related to severe storms, tornadoes, or flooding):  
(866) 562-5227

## **U.S. Environmental Protection Agency (EPA)**

US EPA Region 5 | 77 W. Jackson Blvd. | Chicago, IL 60604  
(312) 353-2000 | Toll-Free (800) 621-8431 | [www.epa.gov/region5](http://www.epa.gov/region5)

Office of Water: [www.epa.gov/region5/water](http://www.epa.gov/region5/water)

Office of Grants and Debarment: [www.epa.gov/ogd](http://www.epa.gov/ogd) - provides information about all of the grants that EPA offers. Competitive grant opportunities will be posted when they become available (and are linked to [grants.gov](http://grants.gov)).

The Catalog of Federal Funding Sources for Watershed Protection Web site is a searchable database of financial assistance sources (grants, loans, and cost-sharing) available to fund a variety of watershed protection projects: [cfpub.epa.gov/fedfund](http://cfpub.epa.gov/fedfund)

## **U.S. Small Business Administration (SBA)**

Illinois District Office | 500 W. Madison Street, Suite 1250 | Chicago, Illinois 60661-2511  
(312) 353-4528 | [www.sba.gov](http://www.sba.gov)

Topics: Multi Objective Management, Mitigation Funding.

Funding to provide support to grassroots organizations to develop watershed partnerships in part comes from the EPA. Eight federal agencies are responsible for developing a Clean Water Action Plan. As a result of this plan, in 1998 the EPA selected the River Network to administer and coordinate the Watershed Assistance Grants (but the EPA no longer provides funding). Agencies responsible for developing the Action Plan include Defense, Interior, Agriculture and others. SBA offers low interest loans to homeowners, renters, businesses, and non-profit organizations of all sizes after a declared disaster.

## **U.S. Department of Transportation (USDOT)**

U.S. Department of Transportation | 1200 New Jersey Avenue SE | Washington, DC 20590  
(202) 366-4000 | [www.dot.gov](http://www.dot.gov)

### **Scenic Byway Program: U**

-The purpose is to create or preserve treasured American byways or roads. Grants are available for states and communities to develop scenic roadways and associated open space.

[www.byways.org](http://www.byways.org) [www.byways.org/explore/states/IL](http://www.byways.org/explore/states/IL) (Byways in Illinois)

## **State Sources**

The State of Illinois administers numerous programs for community-based water resource management. Some of the money for these programs originates at the federal level and is pass-through funding, but some also comes directly from the state. Contact your local state legislative office for details: [www.illinois.gov](http://www.illinois.gov)

Catalog of State Assistance to Local Governments (Twelfth Biennial Edition- 2008):  
This catalog is published biennially and describes state programs providing financial and technical assistance to counties, municipalities, townships, and special districts (excluding school districts). The catalog is intended to serve as a comprehensive source of information on state/local assistance. [www.ilga.gov/commission/lru/SALG.pdf](http://www.ilga.gov/commission/lru/SALG.pdf)

### **Illinois Department of Agriculture**

Division of Natural Resources | P.O. Box 19281 State Fairgrounds | Springfield, IL 62794  
(217) 782-2172 | (217) 524-6858 TTY | [www.agr.state.il.us](http://www.agr.state.il.us)

Topics: Land and Water Resources, Site Review, Groundwater, Erosion Protection.

The Illinois Department of Agriculture/Bureau of Land and Water Resources works closely with the 98 local Soil and Water Conservation Districts and other conservation partners to provide technical and financial assistance to landowners to address erosion/sediment control and flooding concerns.

### **Illinois Dept. of Commerce and Economic Opportunity (DCEO)**

Director's Office | 100 W. Randolph | Chicago, IL 60601 | (312) 814-7179  
Springfield Office | 620 E. Adams | Springfield, IL 62701 | (217) 782-7500

### **Community Development Assistance Program (CDAP): G, U**

DCEO may receive funding through a congressional appropriation of funds to address community development needs caused by a natural disaster. These funds are administered by the Department of Housing and Urban Development (HUD) through the Community Development Block Grant (CDBG) program. Each appropriation has separate requirements deemed necessary by Congress. HUD then decides how much funding each state will receive and requires the state to submit a plan of how the funds will be distributed to local governments. Typically, the distribution plan has a period for public comments on use of funds. Once the plan is approved by HUD, the state will request applications from affected areas.

-Illinois currently has 3 allotments of funds in different stages of approval.

### **Illinois Department of Human Services (DHS)**

Springfield Office | 100 South Grand Avenue East | Springfield, IL 62762  
(217) 557-1601 | (217) 557-2134 TTY  
Chicago Office | 401 South Clinton Street | Chicago, IL 60607  
(800) 843-6154 | (312) 793-2354 TTY | [www.dhs.state.il.us](http://www.dhs.state.il.us)

The Illinois Department of Human Services supports and partners with many initiatives throughout the State of Illinois. We are aimed at increasing the availability, accessibility and/or quality of life and public services for thousands of Illinois families. Some initiatives are funded with public dollars, some with private dollars, and some reflect a partnership of public and private support.

### **Illinois Department of Natural Resources (IDNR)**

Office of Water Resources | One Natural Resources Way | Springfield, IL 62701  
(217) 782-3863 | [www.dnr.state.il.us](http://www.dnr.state.il.us)

The Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR) is the state's primary floodplain management agency. IDNR/OWR regulates construction activities (including dams) in the state's rivers, lakes, and streams. The agency is also very active in the planning and funding of urban flood control and structural flood control projects when deemed appropriate. The IDNR receives many requests for assistance to solve flooding and other related water resources problems, each of which leads to some category of study or action. The agency is the primary contact for line item or state budget requirements to address statewide flood issues. The IDNR reviews all state-funded construction activities within floodplains to ensure compliance with Executive Order #5. IDNR/OWR coordinates the National Flood Insurance Program (NFIP), mitigation activities, and floodplain mapping issues across the state.

### **Illinois Department of Public Health**

Illinois Department of Public Health | 535 West Jefferson Street | Springfield, Illinois 62761  
(217) 782-4977 | TTY (800) 547-0466 | [www.idph.state.il.us](http://www.idph.state.il.us)

No matter where you live, your community may experience a natural or manmade disaster — a tornado, flood, winter storm, earthquake, fire, nuclear power plant accident or terrorist attack. In any type of disaster, lives can be saved if people are prepared for the emergency, and know what actions to take when it occurs. The Illinois Department of Public Health provides education and assistance to individuals and communities for their safety and well being.

### **Illinois Department of Revenue**

Willard Ice Building | 101 West Jefferson Street | Springfield, Illinois 62702  
(800) 732-8866 or (217) 782-3336 | TDD: (800) 544-5304 | [www.revenue.state.il.us](http://www.revenue.state.il.us)

James R. Thompson Center | 100 West Randolph Street | Chicago, IL 60601 | (312) 814-5232

The Illinois Department of Revenue offers various conservation programs, special programs for flood victims (including flood debasements for crop loss), and many other types of tax-based assistance. Since tax situations vary greatly, please consult the state website or regional office for applicability and details.

Regional Office Locations: [www.revenue.state.il.us/AboutIdor/locations.htm](http://www.revenue.state.il.us/AboutIdor/locations.htm)

### **Illinois Department of Transportation (IDOT)**

Illinois Dept. of Transportation | Hanley Admin. Bldg. | 2300 S. Dirksen Pkwy. |  
Springfield, IL 62764 | (217) 782-7820 | [www.dot.il.gov](http://www.dot.il.gov)

**Illinois Transportation Enhancement Program:** Provides funding for projects include those that support alternative modes of transportation and that preserve visual and cultural resources, including historic preservation, bike and pedestrian facilities, and landscape/streetscape beautification.

### **Illinois Emergency Management Agency (IEMA)**

Illinois Emergency Management Agency | 2200 S. Dirksen Pkwy | Springfield, Illinois  
62703-4528 | (217) 782-7860 | [www.state.il.us/iema](http://www.state.il.us/iema)

The primary responsibility of IEMA is to better prepare the State of Illinois for natural, manmade, or technological disasters, hazards, or acts of terrorism. IEMA coordinates the state's disaster mitigation, preparedness, response, and recovery programs and activities, functions as the State Emergency Response Commission, and maintains a 24-hour Communication Center and State Emergency Operations Center (SEOC). The SEOC acts as lead in crisis/consequence management response and operations to notify, activate, deploy, and employ state resources in response to any threat or act of terrorism. IEMA assists local governments with multi-hazard emergency operations plans, mitigation plans, and maintains the Illinois Emergency Operations Plan as well as the FEMA-required State Mitigation Plan.

IEMA also administers the Public Assistance (PA) Program and the Individual Assistance Program. The PA Program provides federal disaster assistance to state and local government organizations for debris removal, emergency protective measures, and the permanent restoration or replacement of public facilities that are owned and operated by an eligible organization. Assistance may also be provided to certain private non-profit organizations that provide services of a governmental nature open to all persons within the community. Under the Individual Assistance Program, IEMA works closely with the FEMA and the SBA to provide disaster assistance to individuals, families, and businesses following Presidential disaster declarations. Disaster assistance may come in the form of loans or grants to restore the disaster area to pre-disaster condition.

The agency provides training for municipal and county emergency managers and first responders on a wide range of topics such as emergency planning, unified command, exercise design and evaluation, mitigation, and terrorism planning. IEMA offers many different grant opportunities for local jurisdictions to prepare for or to mitigate their hazards.

### **Illinois Environmental Protection Agency (IEPA)**

Division of Water Pollution Control | Permit Section # 15  
1021 North Grand Avenue East | P. O. Box 19276 | Springfield, Illinois 62794-9276  
(217) 782-3362 | [www.epa.state.il.us](http://www.epa.state.il.us)  
[www.epa.state.il.us/water/conservation](http://www.epa.state.il.us/water/conservation) | [www.epa.state.il.us/water/financial-assistance](http://www.epa.state.il.us/water/financial-assistance)

Illinois EPA Regional Offices throughout the state can provide flood-damaged communities with technical assistance related to damaged drinking water and wastewater infrastructure as well as disposal of solid waste, including information about restrictions on open burning of waste.

**Illinois Historic Preservation Agency (IHPA)**

Illinois Historic Preservation Agency | 500 East Madison Street | Springfield, IL 62701  
(217) 785-1511 | [www.illinoishistory.gov](http://www.illinoishistory.gov) | [HPA.info@illinois.gov](mailto:HPA.info@illinois.gov)

Point of contact: Anne Haaker, Deputy State Historic Preservation Officer | (217) 782-4836

Eligible projects include historical surveys, education and historical preservation planning and construction.

**Illinois State Water Survey**

University of Illinois at Urbana-Champaign | Institute of Natural Resource Sustainability  
Illinois State Water Survey | 2204 Griffith Drive | Champaign, IL 61820  
[www.isws.illinois.edu](http://www.isws.illinois.edu)

The Illinois State Water Survey (ISWS) is one of the Scientific Surveys of the State of Illinois, which provide research and public service in natural resources of the state. ISWS has provided floodplain information services to professionals and to the public in various capacities since 1975. Please note that ISWS is not a funding agency.



## Other Public or Non-Profit Sources

### **America the Beautiful Fund**

725 15th St., NW, Suite 605 | Washington, DC 20005  
(202) 638-1649 | [www.america-the-beautiful.org](http://www.america-the-beautiful.org)

Operation Green Plant (free seeds): [www.america-the-beautiful.org/free\\_seeds/index.php](http://www.america-the-beautiful.org/free_seeds/index.php)

### **American Planning Association**

American Planning Association | 122 S. Michigan Avenue, Suite 1600 | Chicago, IL 60603  
(312) 431-9100 | [www.planning.org](http://www.planning.org) | State Chapter Website: [www.ilapa.org](http://www.ilapa.org)

The new Hazards Planning Research Center ([www.planning.org/nationalcenters/hazards](http://www.planning.org/nationalcenters/hazards)) provides numerous resources about best management practices (BMPs) in floodplain management and hazard mitigation planning.

### **American Red Cross**

American Red Cross of Greater Chicago | 2200 W. Harrison St. | Chicago, IL 60612  
(312) 729-6100 | [www.redcross.org](http://www.redcross.org)

-Many resources to help communities and individuals deal with post-disaster recovery and repair. For example, the Red Cross produces several excellent booklets dealing with flood recovery.

-Disaster preparedness education and national response: [www.redcrossillinois.org/disaster-services](http://www.redcrossillinois.org/disaster-services)

-To find your local chapter: [www.redcross.org/where/chapts.asp#IL](http://www.redcross.org/where/chapts.asp#IL)

### **AmeriCorps**

**NCCC North Central Region** | Iowa Braille & Sight Saving School | 1002 G Ave. | Vinton, IA 52349  
(319) 472-9664 | [www.americorps.gov/about/programs/nccc.asp](http://www.americorps.gov/about/programs/nccc.asp) | [jburns@cns.gov](mailto:jburns@cns.gov)

### **National Civilian Community Corps (NCCC)**

NCCC provides team-based support to communities with strategic plans to help implement flood mitigation projects, disaster preparedness, and post-disaster community renovation projects.

States Served: IA, IL, IN, MI, MN, NE, ND, OH, SD, and WI.

### **Association of State Floodplain Managers (ASFPM)**

ASFPM Office | 2809 Fish Hatchery Road, Suite 204 | Madison, WI 53713  
(608) 274-0123 | [asfpm@floods.org](mailto:asfpm@floods.org) | [www.floods.org](http://www.floods.org)

The Association of State Floodplain Managers is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery. ASFPM has become a respected voice in floodplain management practice and policy in the United States because it represents the flood hazard specialists of local, state, and federal government, the research community, the insurance industry, and the fields of engineering, hydrologic forecasting, emergency response, water

resources, and others. Hosts an annual conference and provides technical resources and training opportunities.

Paul Osman, CFM, IL State Floodplain Manager  
Illinois Dept. of Natural Resources | One Natural Resources Way | Springfield, IL 62702  
(217) 782-4428 | [paul.osman@illinois.gov](mailto:paul.osman@illinois.gov)

**Chicago Metropolitan Agency for Planning (CMAP- formerly NIPC)**  
233 South Wacker Drive, Suite 800 | Chicago, IL 60606  
(312) 454-0400 | [www.cmap.illinois.gov](http://www.cmap.illinois.gov)

CMAP provides a variety of publications and assistance:

- Model floodplain and storm water management ordinances
  - Conservation Design Resource Manual: Language and Guidelines for Updating Local Ordinances
  - Flood Insurance Rate Maps
  - Storm water best management practices
  - Building Sustainable Communities Series and Sustainable Development Guidebook
  - Sourcebook on Natural Landscaping for Local Officials
  - Natural Landscaping for Local Officials: Design and Management Guidelines
  - Restoring and Managing Stream Greenways
  - Native Plant Guide for Streams and Storm water Facilities in Northeastern Illinois
  - Green Infrastructure Vision
  - Guidance for Developing Watershed Action Plans in Illinois
- [www.cmap.illinois.gov/policy/environment.aspx?ekmense1=c580fa7b\\_8\\_18\\_380\\_5](http://www.cmap.illinois.gov/policy/environment.aspx?ekmense1=c580fa7b_8_18_380_5)  
\*Hardcopies are available through the publications department for those which cannot be downloaded from the website.

### **Chicago Wilderness**

Chicago Wilderness | 8 South Michigan Avenue, Suite 900 | Chicago, IL 60603  
(312) 580-2137 | [www.chicagowilderness.org](http://www.chicagowilderness.org) | [cwadmin@chicagowilderness.org](mailto:cwadmin@chicagowilderness.org)

### **Sustainable Watershed Action Team**

The Sustainable Watershed Action Team (SWAT) project, funded by Chicago Wilderness, is designed to provide technical assistance to local governments and developers in northeastern Illinois in designing and implementing environmentally sensitive construction projects or developing comprehensive plans containing state-of-the art practices for such issues a storm water management. For more information, visit the Chicago Metropolitan Agency for Planning's website at [www.cmap.illinois.gov/template\\_2columninterior.aspx?id=11220](http://www.cmap.illinois.gov/template_2columninterior.aspx?id=11220).

### **Ecological Planning & Design Directory**

The Ecological Planning and Design Directory is a repository of tools and techniques for achieving sustainable development in communities, whether one acts as a decision maker on behalf of local government or for commercial development. Developed by members of the Chicago Wilderness alliance, the directory is a wealth of resources to

promote innovative thinking and sound choices in the areas of biodiversity and natural habitat conservation, conservation design, sustainable development, water resource management. Visit the directory at [www.nipc.org/environment/sustainable](http://www.nipc.org/environment/sustainable) .

### **Friends of the Chicago River**

Friends of the Chicago River | 28 East Jackson, Suite 1800 | Chicago, IL 60604  
(312) 939-0490 | [www.chicagoriver.org](http://www.chicagoriver.org)

Education and outreach, policy and planning, and on-the-ground projects.

### **Great Lakes Commission**

Eisenhower Corporate Park | 2805 S. Industrial Hwy, Suite 100 | Ann Arbor, MI 48104  
(734) 971-9135 | [www.glc.org](http://www.glc.org)

### **Great Lakes Basin Program for Soil Erosion and Sediment Control**

USDA-sponsored projects include protection of Great Lakes Water Quality by controlling erosion and sedimentation (only available in Lake, Cook, and Will Counties). Typical grant amount is up to \$40,000.

-Application deadline in March.

[www.glc.org/basin](http://www.glc.org/basin)

### **Illinois Association for Floodplain and Stormwater Management (IAFSM)**

35W 749 Bluff Drive | St. Charles, IL 60175  
(630) 443-8145 | [www.illinoisfloods.org](http://www.illinoisfloods.org)

Annual conference, floodplain manager certification, home study courses, technical resources, guidebooks on flood reduction, and training opportunities.

### **Illinois Association of Regional Councils**

[www.ilaronline.org](http://www.ilaronline.org)

Provides information regarding Regional Councils assistance in planning and grant writing.

### **Illinois Conservation Foundation (ILCF)**

(217) 785-2003 | [www.ilcf.org](http://www.ilcf.org)

The Illinois Conservation Foundation to preserve and enhance our natural resources by supporting ecological, educational, and recreational programs. Preference will be given to programs for the disabled and projects advancing conservation education and youth hunting and fishing.

### **Illinois Library Search**

[www.eli2.org](http://www.eli2.org)

Search for any library in Illinois by name, type, or location. Your local library is a great resource for information on grants and technical assistance programs.

### **Institute for Business & Home Safety (IBHS)**

(813) 286-3400 | [www.disastersafety.org](http://www.disastersafety.org)

Great technical assistance documents include: Community Land Use Evaluation (CLUE) for Natural Disasters Questionnaire, Survey of State Land-Use and Natural Hazards Planning Laws, and Showcase State Model for Natural Disaster Resistance and Resilience: A Guidebook for Loss Reduction Partnerships.

Community Land Use Planning and Natural Disasters:  
[www.disastersafety.org/text.asp?id=land\\_use\\_planning](http://www.disastersafety.org/text.asp?id=land_use_planning)

### **Midwest Flood Response and Recovery**

[www.usa.gov/flooding.shtml](http://www.usa.gov/flooding.shtml)

Official information and services from the U.S. government.

### **National Fish and Wildlife Foundation (NFWF)**

National Fish and Wildlife Foundation | 1133 Fifteenth Street, Suite 1100 | Washington, DC 20005 (202) 857-0166 | [www.nfwf.org](http://www.nfwf.org)

Numerous grants are available for a wide range of projects that focus on habitat restoration and conservation. Each individual program varies in terms of eligibility, grant cycle, administration, funding level, and other specifics; please see the website for applicable grant opportunities. Potential funding opportunities include the Sustain Our Great Lakes Program, Pulling Together Initiative, and Upper Mississippi Watershed Fund.

### **National Tree Trust**

National Tree Trust | 100 Arbor Avenue | Nebraska City, NE 68410  
(888) 448-7337 | [www.nationaltreetrust.org](http://www.nationaltreetrust.org)

The National Tree Trust promotes healthy communities by providing resources that educate and empower people to grow and care for urban and community forests. NTT provides support and resources to urban and community forestry and conservation nonprofit organizations.

### **National Urban & Community Forestry Advisory Council**

[www.treelink.org/nucfac](http://www.treelink.org/nucfac)

Provides funding for urban and community forestry projects. (202) 309-9873  
[http://www.treelink.org/nucfac/general\\_info.html](http://www.treelink.org/nucfac/general_info.html) \*Also, [www.treelink.org](http://www.treelink.org) has a Resource Center that provides links to a wide variety of helpful resources and even has links to Illinois resources- [www.treelink.org/linx/?navLocationRef=14](http://www.treelink.org/linx/?navLocationRef=14).

### **Natural Hazards Center**

**University of Colorado at Boulder** | 482 UCB | Boulder, CO 80309  
(303) 492-6818 | [hazctr@colorado.edu](mailto:hazctr@colorado.edu)

Advances and communicates knowledge on hazards mitigation and disaster preparedness, response, and recovery through publications, workshops, research, and other resources.

**North American Lake Management Society (NALMS)**

North American Lake Management Society | PO Box 5443 | Madison, WI 53705  
(608) 233-2836 | [www.nalms.org](http://www.nalms.org) | [info@nalms.org](mailto:info@nalms.org)

The North American Lake Management Society (NALMS) is the leading resource on the North American continent for lake and reservoir management information, which includes the full panoply of land use and water issues which occur on a watershed level. NALMS' mission to forge partnerships among citizens, scientists, and professionals to foster the management and protection of lakes and reservoirs is met through conferences, programs, publications, and participation in nationally important committees, councils, and partnerships linked with other water-focused organizations and government agencies.

**Rails-to-Trails Conservancy (RTC)**

The Duke Ellington Building | 2121 Ward Ct., NW | 5th Floor | Washington, DC 20037  
(202) 331-9696 | [www.railstotrails.org](http://www.railstotrails.org)

Funding trails and greenways takes a bit of ingenuity and a lot of research. Although RTC does not directly fund the development of trails, there are many federal, state, and local government funding mechanisms as well as grants, private partnerships, and other creative funding methods available to finance the development of your trail:

[www.railstotrails.org/whatwedo/trailbuilding/technicalassistance/toolbox/20080710\\_funding\\_financing.html](http://www.railstotrails.org/whatwedo/trailbuilding/technicalassistance/toolbox/20080710_funding_financing.html)

**Ready Illinois**

[www.ready.illinois.gov](http://www.ready.illinois.gov)

Preparedness and Planning for Emergencies and Disasters: tips for what to do before, during, and after a disaster.

**River Network's Resource Library**

[www.rivernetwork.org/resource-library](http://www.rivernetwork.org/resource-library)

A growing compilation of manuals, publications, web pages, articles, videos, presentations, and more. The Resource Library allows you to search by keyword or category and provides links to many helpful resources that can help you search for funding opportunities, volunteers, foundations, technical assistance tools, and other resources.

## Private/Foundational Sources

### **Alliance of Illinois Community Foundations (AICF)**

[site.allianceilcf.org](http://site.allianceilcf.org)

Includes a list of all 2009 AICF members and links to their websites.

### **Bank of America**

[www.bankofamerica.com/philanthropic/grantmaking.action](http://www.bankofamerica.com/philanthropic/grantmaking.action)

Search for grants using their database.

### **Captain Planet Foundation**

Captain Planet Foundation | 133 Luckie Street, 2nd Floor | Atlanta, GA 30303

(404) 522-4270 | [www.captainplanetfdn.org](http://www.captainplanetfdn.org)

Eligible projects include hands-on environmental activities for children 6-18 such as urban gardens, water testing, and habitat restoration. Grants range from \$250-\$2,500; deadlines are at the end of each quarter.

### **Donors Forum of Chicago**

Donors Forum | 208 South LaSalle, Suite 1540 | Chicago, IL 60604

(312) 578-0090 | Toll-free (888) 578-0090 | [info@donorsforum.org](mailto:info@donorsforum.org) | [donorsforum.org](http://donorsforum.org)

The Forum is a resource for networking and education, information and knowledge, and leadership on behalf of philanthropy in Illinois. It offers a number of resources for donors and grant seekers, including publications focused on foundations and giving in Illinois.

### **Environmental Systems Research Institute (ESRI)**

(202) 566-1600 | [www.esri.com](http://www.esri.com)

Provides products, training, and support for GIS.

### **Foundation Center**

Headquarters | 79 Fifth Avenue/16th Street | New York, NY 10003

(212) 620-4230 | [foundationcenter.org](http://foundationcenter.org)

The Foundation Center is a national nonprofit service organization connecting nonprofits and the grant makers supporting them to tools they can use and information they can trust. Its audiences include grant seekers, grant makers, researchers, policymakers, the media, and the general public. The Center maintains a comprehensive database on U.S. grant makers and their grants; issues a wide variety of print, electronic, and online information resources; conducts and publishes research on trends in foundation growth, giving, and practice; and offers an array of free and affordable educational programs.

Cooperating Collections are free funding information centers in libraries, community foundations, and other nonprofit resource centers that provide a core collection of Foundation Center publications and a variety of supplementary materials and services in areas useful to grant seekers. Cooperating Collections participants in Illinois can be found at [foundationcenter.org/collections/ccil.html](http://foundationcenter.org/collections/ccil.html)

**Gateway Center for Giving**

1141 South 7th Street | St. Louis, MO 63104

(314) 621-6220 | [info@centerforgiving.org](mailto:info@centerforgiving.org) | [www.centerforgiving.org](http://www.centerforgiving.org)

The Center is an association of grant makers serving the St. Louis region that provides reports, directories, and other resources. The Center itself is not a grant making organization, but rather provides information and services that help donors work more effectively and have a greater impact on the issues they care about and the nonprofits they fund. Also connects grant makers with non-profits.

**Gaylord and Dorothy Donnelly Foundation**

35 East Wacker Drive, Suite 2600 | Chicago, IL 60601

(312) 977-2700 | [www.gddf.org](http://www.gddf.org)

Website provides information on the foundation (mission= land conservation and artistic vitality), its projects, and grant opportunities (Chicago region= major focus).

**Grand Victoria Foundation**

**Chicago Office** | 230 W. Monroe St., Ste. 2530 | Chicago, IL 60606 (312) 609-0200

**Elgin Office** | 50 S. Grove Avenue, Ste. A | Elgin, IL 60120 (847) 289-8575

[www.grandvictoriafdn.org](http://www.grandvictoriafdn.org)

Eligible projects include proposals that address pollution, natural area restoration, and the use of BMPs in northeastern Illinois (outside Chicago). Application deadlines twice yearly.

**Great Lakes Directory**

[www.greatlakesdirectory.org/grants.htm](http://www.greatlakesdirectory.org/grants.htm)

List of environmental grant making foundations around the Great Lakes region (with links provided).

**Illinois Clean Energy Community Foundation**

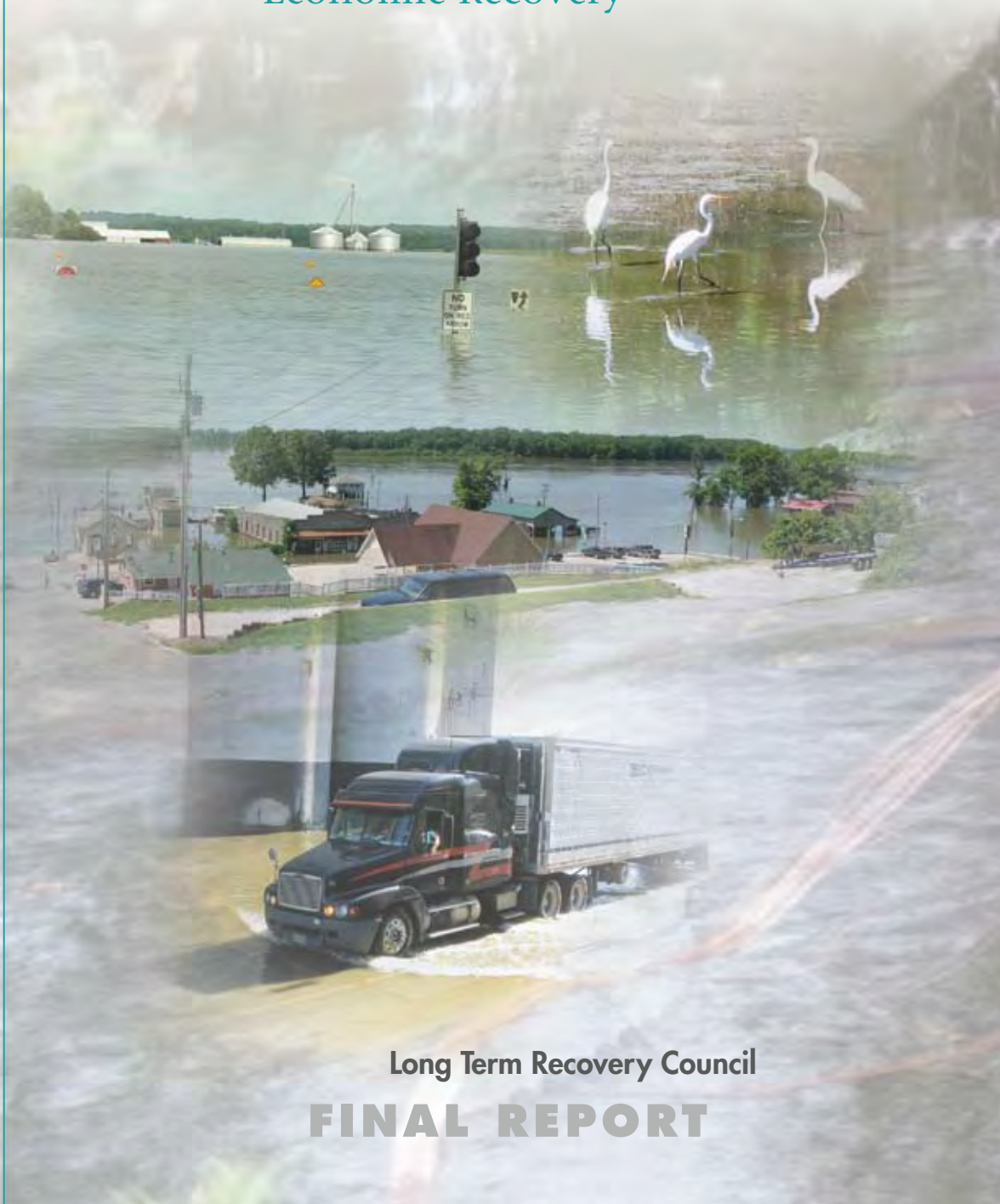
2 N. LaSalle St., Suite 1140 | Chicago, IL 60602

(312) 372-5191 | [info@IllinoisCleanEnergy.org](mailto:info@IllinoisCleanEnergy.org) | [www.illinoiscleanenergy.org](http://www.illinoiscleanenergy.org)

The Foundation supports programs and projects that will improve energy efficiency, develop renewable energy resources, and preserve and enhance natural areas and wildlife habitats throughout the state. Natural Areas grants focus on land acquisition and planning. Deadlines are in January and July.

## Section B

### Actions Needed to Ensure Robust Community and Statewide Economic Recovery



Long Term Recovery Council  
**FINAL REPORT**



## CHAPTER V - SECTION B: ACTIONS NEEDED TO ENSURE ROBUST COMMUNITY AND STATEWIDE ECONOMIC RECOVERY

Full economic recovery in the afflicted areas will require a balance among economic, social and environmental goals of a region. As regions establish goals for the future, they must avoid unwise use of the floodplain and plan in ways to minimize danger and damages that result from floods. Preservation and enhancement of our State's rich natural resource base is an essential component of economic recovery.

Planning for natural hazards strives to eliminate threats to life, property, the environment, and the mental health and well being of floodplain occupants. In addition, careful planning is necessary to ensure the viability of critical infrastructure and the regional economy. Critical infrastructure, such as water and wastewater treatment plants, power plants, and major highways and bridges would either be elevated out of the flood's reach or protected against its effects.

Critical infrastructure could include, on a situation-dependent basis, municipal drinking water facilities stations, major highways bridges, major passenger and freight railroads, critical access roads running through or over floodplains, major airports, hospitals and related medical care facilities, electricity generating plants, grain handling and transportation facilities, and facilities that generate, store or dispose of hazardous, toxic or radioactive materials.

Sharing the challenge of floodplain management is the message received from the Galloway report as well as from community leaders who participated in the Long Term Recovery Listening sessions. When considering federal, state or local investments, there is a shared responsibility and accountability for accomplishing floodplain management among all levels of government and with local citizens. Federal program investments require careful consideration for the risk of locating or funding non-floodplain dependent activities within a floodplain.

The process of collecting this information from each of the respective Economic Development Districts provided the following insights into our current comprehensive economic development strategies for the flood impacted counties in Illinois. A comprehensive economic development strategy (CEDS) is designed to bring together the public and private sectors in the creation of an economic roadmap to diversify and strengthen regional economies. The CEDS should analyze the regional economy and serve as a guide for establishing regional goals and objectives, developing and implementing a regional plan of action, and identifying investment priorities and funding sources. A CEDS integrates a region's human and physical capital planning in the service of economic development. Integrated economic development planning provides the flexibility to adapt to global economic conditions and fully utilize the region's unique advantages to maximize economic opportunity for its residents by attracting private investments that can create jobs for the region's residents. A CEDS must be the result of a continuing economic development planning process developed with broad-based and diverse public and private sector participation. It must set forth the goals and objectives necessary to solve the economic development problems of the region and clearly define metrics of success. Finally, a CEDS provides a useful benchmark by which a regional economy can evaluate opportunities with other regions in the national economy.

Most of the projects contained in the CEDS reports are brick and mortar projects. These projects may have merit depending on the costs and benefits associated with them. What seems to be lacking from the CEDS reports are projects and policies which are not capital focused. The four listening sessions held in Quincy, Collinsville, Casey and Rock Island yielded numerous potential policies and projects aimed at mitigating flood impacts as well as recovering from the impacts of the 2008 flood. A good portion of these projects were infrastructure related, of which a handful could also be found in the respective CEDS documents.

The remaining non-infrastructure programs and policies were absent from the CEDS reports. These non-capital potential projects and policies have three main threads: Collecting good information, effective organizing and sharing of resources and information, and utilizing and implementing information. An example of collecting good information would be conducting flood plain studies, as suggested by the Quincy listening session participants, to better understand, manage and plan for the mitigation of flood events. An example of organizing and sharing information would be the idea suggested by a participant to create an aid matrix or database which would allow for the quick assessment and dispatch of flood response resources. Additionally, a recurring theme, which was mentioned at nearly all the sessions, was the importance of improving and establishing a clear communication protocol amongst all the various local, state and federal entities involved in response and recovery to flood events to facilitate a quicker and more effective response. An example of utilizing and implementing information would be the creation of, and follow through of, floodplain management plans, comprehensive plans, or hazard mitigation plans. The aim of an economic recovery should not stop at restoring the respective local economies to their pre-disaster state, rather, recovery should be expanded to increase the preparedness and mitigate the actions of future natural hazard events. It would appear that the CEDS reports and listening sessions have yielded several solid ideas for long-term community recovery.

Projects and policies that can be implemented at minimum cost should be given priority. In the Casey listening session, participants noted that access to State and Federal money for flood related projects requires a matching of funds by the participating jurisdiction, and many of these jurisdictions do not have the funds available. Education and outreach is a program and project area that could have a large impact with minimal cost. Producing multimedia education materials about flood insurance, family disaster plans, and business disaster plans could be effective in minimizing the effects of natural disasters on citizens and businesses. Education and outreach might also include training programs for local Emergency Management Agency (EMA) officials and first responders which are aimed at building capacity for effective disaster response. These are just a few of the multitude of cost-effective education and outreach strategies that might be employed.

The impact of well thought out and implemented planning efforts should not be underestimated. It is key when selecting planning actions aimed at recovery and mitigation to strike a balance between three types of actions or programs: 1) those which can or should be implemented everywhere, 2) actions which should be planned for and implemented regionally to be effective or to take advantage of economies of scale, and 3) projects that are tailored to the specific needs of each community. Actions or projects which could be implemented widely and have ubiquitous applicability might, for example, include programs to distribute weather radios or the

installation of civil defense sirens to warn citizens of potential flooding or other natural hazards. Planning and projects which occur at a county level require a regional view and should include floodplain or watershed management, as the causes and effects of a single flooding event can occur across many municipalities and a large geographic area. Finally, projects aimed at addressing local conditions are also important. These projects may include specific buyouts, elevations or the construction of localized storm water management infrastructure. It is important in the planning process to recognize and balance these three types of actions or programs to maximize effectiveness and minimize cost.

With the need for collecting, disseminating and implementing of information, as well as the need for cost effective actions in mind, we have highlighted projects/ policies that meet these criteria and are worthy of further consideration and should be considered “key projects.” A community’s readiness to implement a proposed project is demonstrated through planning. Several of the projects listed in the CEDS would move to a higher recovery value upon completion of the Hazard Mitigation Plan. Those rated as high were discussed during the regional listening sessions, and confirmed through two federal planning processes: Economic Development Administration Comprehensive Economic Development Strategies and FEMA Hazard Mitigation Plans.

<b>Economic Development District</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Bi-State	Economic	East Moline Economic Development Land Use Analysis	\$100,000	High
Bi-State	Infrastructure	Eastern Iowa Industrial Center (Davenport) Infrastructure	\$4,315,000	High
Southwestern	Infrastructure	Interceptor Sewer Rehabilitation Madison County & Metro East Sanit. Dist.	\$2,500,000	High
Southwestern	Infrastructure	Surface Drainage Storm Water Improvement, Tri-City Regional Port District	\$1,470,000	High
Southwestern	Infrastructure	Residential Drainage Project Village of Alhambra	\$100,000	Medium
Southwestern	Infrastructure	Levee System Improvements/ Upgrades	\$200,000,000	High
Two-Rivers	Infrastructure	Mid-America Intermodal Authority Port District	\$6,000,000	High
Greater Wabash	Infrastructure	Small Business Park (Lawrenceville)	\$2,500,000	Medium
Greater Wabash	Infrastructure	Industrial Park Robinson	\$1,900,000	Medium
Greater Wabash	Transportation	Extension of Crawford County Airport	\$25,000,000	Medium
Greater Wabash	Utilities- Water	New water treatment plant	\$10,000,000	Medium
South Central	Infrastructure	Replacement Water Treatment Facilities (Newton)	\$2,500,000	Medium
South Central	Infrastructure	Drainage Improvements for the GSI Group, Inc. Plant (Newton)	Unknown	Medium
Western Illinois	Infrastructure	Highway Bridge over the Mississippi River at Fort Madison	\$100,000,000	Medium
Western Illinois	Infrastructure	Route 136 and Route 336 Road Improvements	Unknown	Low
Western Illinois	Infrastructure	Flood Management Improvements	Unknown	Low
Western Illinois	Infrastructure	Port Authority and River Terminal Development	Unknown	Low
Western Illinois	Infrastructure	Flood Management Improvements	Unknown	Low
Western Illinois	Infrastructure	Four Lane Expansion of Highway 34	Unknown	Low

## Comprehensive Economic Development Strategies (CEDS)

### *Alignment with Long Term Recovery Regional Listening Session Recommendations*

In review of the regional listening sessions, the following projects were identified as strategic investments and also appear in Economic Development District's (EDD) CEDS. In addition, these projects were identified as priority projects by the EDD and meet several of the criteria utilized as part of the Long Term Community Recovery Plan Project Rating utilized by other states.

### **February 6, 2009 Quincy Listening Session**

#### *Two Rivers Economic Development District CEDS and Western Illinois Economic Development District CEDS*

<b>Group Recommendations</b>	<b>Corresponding CEDS Project</b>	<b>Comments</b>
<i>Create adequate protection for the Industrial Park in Quincy</i>	<i>Mid-America Intermodal Authority Port District (Adams County)</i>	<i>In addition to the improvements that are included in this project, the improvement of flood protection infrastructure for the industrial park should be considered to protect the investment and limit the potential interruption in the use capability of industrial park.</i>
<i>Address areas of concern HWY 57, HWY 336, Interstate 172, Marble Head Bypass, Ursa Farmer Coop, and Ferry Landing Road</i>	<i>Route 136 and Route 336 Road Improvements (Hancock County)</i>	<i>Although a representative from Hancock was not included in this discussion group, the participants in the group identified HWY 336 as a road in the floodplain that should be protected. Improvements to this road are included in the Western Illinois EDD CEDS report.</i>

The following is a more detailed description of projects submitted by the respective economic development districts that align with the goals identified during the listening session.

**Western Illinois Economic Development District**

County	Project Type	Project	Estimated Cost	Rating of Recovery Value
Hancock	Infrastructure	Highway Bridge over the Mississippi River at Fort Madison	\$100,000,000	Medium
Hancock	Infrastructure	Route 136 and Route 336 Road Improvements	Unknown	Low
Hancock	Infrastructure	Flood Management Improvements	Unknown	Low
Henderson	Infrastructure	Port Authority and River Terminal Development	Unknown	Low
Henderson	Infrastructure	Flood Management Improvements	Unknown	Low
Henderson	Infrastructure	Four Lane Expansion of Highway 34	Unknown	Low

Both Hancock and Henderson Counties experienced severe damages as a result of the June 2008 flood event. However, neither have Hazard Mitigation Plans in place. While highway and bridge corrections are much needed in this region to deal with damage and disruption caused from flooding, planning is not fully developed for the proposed projects.

**Warsaw/ Hamilton Road Improvements:** Complete a major overhaul of the Warsaw to Hamilton road, including resurfacing and widening.

**Four Lane Expansion of Highway 34:** Construct a four-lane highway along the Route 34 corridor between Monmouth and Burlington.

**Port Authority and River Terminal Development:** Continue to develop the Port Authority and River Terminal programs for Henderson and Hancock Counties.

**Levee System Improvements/ Flood Management:** Improve the levee system along the Mississippi River corridor through reconstruction and minimize flood potential through wetland regeneration.

**Two Rivers Economic Development District**

<b>County</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Adams	Infrastructure	Mid-America Intermodal Authority Port District	\$6,000,000	High

This project is located in an area with a FEMA Approved Hazard Mitigation plan. The project has high regionalized impact. The community has demonstrated high levels of support for this project through local public and private partnerships.

**Mid-America Intermodal Authority Port District:** This project consists of the installation of infrastructure for an intermodal port on the Mississippi River south of Quincy to allow for roll-on roll-off access to barges. The infrastructure will benefit the industries currently located at the port area as well as regional import/ export industries in the Midwest. This grant request will allow for water, sewer and road to go from the industrial park to the river’s edge. The dock construction will provide a ramp for off loading cargo, which can then be transported by rail or truck.

The following items must be included in the project development:

1. **Land acquisition** includes acquiring approximately 50 acres of land on the river side of the levee for the development of the port facility and 111 acres on the land side of the levee for development of a terminal and other infrastructure supporting future development. An environmental assessment is necessary as well as mitigation for the wetlands taken.
2. **Road construction** includes a road from 5<sup>th</sup> Street to the dock on the Mississippi River.
3. **Port construction** includes the construction of a working surface area, a concrete roll-on/ roll-off loading dock area, one mooring cell and tie-up for barge.
4. **Wetland mitigation** includes mitigation of the wetlands disturbed as part of the port construction.
5. **Water main** includes a 3,600 linear feet extension.
6. **Sewer main** includes a 3,700 linear feet extension.
7. **Site preparation & administration/ lease building** includes extension of necessary utilities, site filling and grading, fencing and security and the design and construction of one structure for administration offices and lease space.

The total request amount is \$6,000,000. The local match is \$2,636,524, which comes from IDOT, Huber and ADM industries, DCEO and Adams County.

**February 17, 2009 Collinsville Listening Session**

*Southwestern Illinois Economic Development District CEDS*

<b>Group Recommendations</b>	<b>Corresponding CEDS Project</b>	<b>Comments</b>
<i>Pumps/ back-up power needed for storm sewer management for both Metro East Sanitary District and Granite City Waste Water Treatment Plant</i>	<i>Interceptor Sewer Rehabilitation (Madison County &amp; Metro East Sanitary District)</i>	<i>A properly functioning storm water system is indispensable for flood prevention.</i>
<i>Upgrade of existing storm sewer system</i>	<i>Surface Drainage Storm Water Improvement (Tri-City Regional Port District)</i>	<i>A properly functioning storm sewer system is crucial.</i>

The following is a more detailed description of projects submitted by the respective economic development district that align with the goals identified during the listening session.

**Southwestern Economic Development District**

<b>County</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Madison	Infrastructure	Interceptor Sewer Rehabilitation Madison County & Metro East Sanitation District	\$2,500,000	High
Madison	Infrastructure	Surface Drainage Storm Water Improvement, Tri-City Regional Port District	\$1,470,000	High
Madison	Infrastructure	Residential Drainage Project Village of Alhambra	\$100,000	Medium
Madison	Infrastructure	Levee System Improvements/ Upgrades	\$200,000,000	High

While the impacts from the June 2008 flood event were not as severe in this region, the region has an aggressive plan for floodplain management. The county has an adopted FEMA Hazard Mitigation Plan. The Tri-City Regional Port District, Sewer Rehabilitation, and Levee System Improvement projects appear to have the greatest regional impact given the large number of businesses and residents located in this metro area.

**Interceptor Sewer Rehabilitation:** The 54” interceptor sewer which is over 60-years old is failing. It is subject to major inflow condition and failure due to a high groundwater table. The project involves reconstruction of more than 10,000 feet of sewer line.



**New Wastewater Treatment Plant:** Construction of a new wastewater treatment plant for the Village since their contract has expired with an oil refinery that has treated the Village wastewater for the last 50+ years.

**Surface Drainage Storm Water Improvement:** Critical components of Storm Water Pump Station 408 need immediate repair. The storm water drainage system is essential to redevelopment and job creation at the River’s Edge Business Park.

**Levee System Improvements/ Upgrades**

**February 24, 2009 Casey Listening Session**

*Greater Wabash Economic Development District CEDS, South Central Illinois Economic Development District CEDS and Coles County Regional Planning Commission*

<b>Group Recommendations</b>	<b>Corresponding CEDS Project</b>	<b>Comments</b>
<i>Remove structures from the floodplain</i>	<i>Replacement Water Treatment Facilities (Jasper County)</i>	<i>This project would replace and relocate the City of Newton’s municipal water treatment plant, which is currently inside the floodplain to outside of the floodplain.</i>
	<i>Drainage Improvements for the GSI Group, Inc. Plant</i>	<i>This project as presented is not yet ready for development, but it has high potential for correcting damages caused by flooding.</i>
	<i>Small Business Park</i>	<i>Presents an opportunity for enhanced capacity and establish mitigation features in a flood prone area.</i>
	<i>Industrial Park</i>	<i>This project creates new infrastructure for future development, giving full consideration to sustainability.</i>
	<i>Extension of Crawford County Airport</i>	<i>This expansion would provide expanded transportation for the region.</i>
	<i>New water treatment plant</i>	<i>Creates new infrastructure that supports economic growth while incorporating sustainable features.</i>

The following is a more detailed description of projects submitted by the respective economic development district that align with the goals identified during the listening session.

**South Central Illinois Regional Planning & Development Commission**

<b>County</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Jasper	Infrastructure	Replacement Water Treatment Facilities	\$2,500,000	Medium
Jasper	Infrastructure	Drainage Improvements for the GSI Group, Inc. Plant	Unknown	Medium

Jasper County suffered a great deal of losses during the June 2008 event, and much of the damages were centered on the City of Newton. The project would have both a local and regional impact, as Newton is a job center. In addition, this project achieves multiple goals for the community infrastructure enhancement and business expansion. Jasper County does not have an approved FEMA Hazard Mitigation Plan; they have, however, made application to begin the planning process.

**Replacement Water Treatment Facilities (City of Newton, Jasper County, Illinois):**

This project focuses upon the current need to replace and relocate the City of Newton’s 83-year old municipal water treatment plant at a total cost of just under \$2.5 million. The current plant is located in a known floodplain and is therefore susceptible to backflow flooding during periods of heavy rainstorms that occur in succession. The resolution of this public infrastructure deficiency has an economic development relationship as well in that it would directly support the pending investment plans of three existing businesses within the community, a proposed biodiesel processing plant, and, possibly, a prospective East Coast fabricated metal products manufacturing firm.

Specifically, the pending private sector investment/ expansion plans of: the GSI Group, Evapco, Inc., and Total Printing Services within Newton would be solidified by assurances of the community’s ability to provide long-term, non-interrupted, dependable potable water service at a reasonably affordable cost. Collectively these three existing firms represent committed future investments of approximately \$4.5 million. In addition, a \$41.5 million, 30 MGY biodiesel processing plant is also proposed for construction with the Southtown Industrial Park in the southern portion of the city. Despite plans to recycle water used in processing biodiesel, the company would still be a major new water user. Collectively, such pending private sector investments would create as many as 200 new jobs in the short term.

This project is the current subject of a \$1.87 million EDA public works grant request under the special Flood Disaster funding allocation. The project is essentially “shovel ready” since earlier efforts by the city beginning in 2007 centered upon attempts to secure approval for a long-term, low-interest, fixed-rate loan from the USDA under its Water and Wastewater program. All

environmental clearances and permits have been secured and a preliminary engineering report has been completed and recently updated.

**Drainage Improvements for the GSI Group, Inc. Plant** (City of Newton, Jasper County, Illinois):

The GSI Group, Inc. is engaged in the design and production of a variety of agricultural machinery and equipment, most of which is intended to aid in the “conditioning” of grains (i.e., corn, soybeans, etc.). The GSI Group, Inc. was recently purchased by Centerpoint Partners, LLC., and, as a result, is now undergoing a change in philosophy regarding their manufacturing and production strategies. This will affect their multiple plants in various Illinois locations, including their good-sized, somewhat underutilized production facility located in Newton, Illinois.

Generally speaking, under the new corporate ownership, the GSI Group’s production operations are now being “centralized and consolidated” based upon specific product lines manufactured by the firm. Previously, various component parts were manufactured at a variety of locations and then shipped for ultimate assembly. As a result of this corporate consolidation strategy, the GSI Group, Inc. facility in Newton, is now the focal point for the production of component parts and assembly of commercial “portable” grain dryers. In recent years, the GSI Group has, on average, invested \$1 million or more per year, in reorienting the space within the production facility for maximum use and/ or acquiring additional production equipment (including some robotic and CNC-controlled machines) to improve their production capacities and efficiencies.

As an outgrowth of such investments, the workforce associated with GSI Group, Inc. in Newton, has increased from 22 employees to a current level of 77 employees. Based on the current advantageous market conditions for corn and soybeans, they expect to undertake additional capital investments that would give rise to future job opportunities. In 2008, our District staff assisted Newton in preparing an Economic Development CDAP application for an off-street, municipally-owned, employee parking lot, to support the GSI Group, Inc.’s investment plans and growing workforce. During visits to GSI’s Newton facility we learned that a portion of the plant is periodically subject to “flooding” immediately following periods of heavy rains.

Although we have little information at this time regarding either the exact nature or cost of a corrective action plan to address such flooding problems, our District suggests that some form of public financing could be utilized by the City of Newton to provide the engineering expertise for one or more viable drainage improvements, which would address and resolve such flooding problems in the future, thereby eliminating a potential impediment to the GSI Group Inc.’s further capital investment plans at its plant in Newton, Illinois.

(This information was provided by the South Central EDD.)

**Greater Wabash Economic Development District**

<b>County</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Lawrenceville	Infrastructure	Small Business Park	\$2,500,000	Medium
Crawford	Infrastructure	Industrial Park	\$1,900,000	Medium
Crawford	Transportation	Extension of Crawford County Airport	\$25,000,000	Medium
Lawrenceville	Utilities- Water	New water treatment plant	\$10,000,000	Medium

While both Lawrence and Crawford Counties received federal disaster declaration, the inundated areas were primarily around Lawrenceville and Saint Francisville in Lawrence County and Palestine and Hutsonville in Crawford Counties. Neither county has an approved FEMA Hazard Mitigation Plan to document the importance of the proposed projects to floodplain management. The proposed projects do present an opportunity for regional impact in an area experiencing high unemployment rates.

**Lawrenceville Small Business Park:** The project is located in Lawrence County, Illinois. The project will benefit Lawrenceville and Lawrence County as well as potentially affecting surrounding counties by providing employment. The immediate economic impact of the project will result in \$725,000 of private investment and approximately 40 jobs. However, the Business Park still has approximately 70 acres available for future businesses which could result in several million dollars of private investment and approximately 160 more jobs. The development includes the construction of 10" water distribution lines, sanitary sewer system collection lines, and 4,364 feet of 30' wide access road. This project will immediately create 40 jobs and potentially more in the future.

**Robinson Ridgway Industrial Park:** The project is located in Robinson in Crawford County, Illinois. The project would benefit the entire Greater Wabash region as well as counties within Indiana. Crawford County lies on the eastern side of Illinois and borders Knox and Sullivan Counties in Indiana. This project is expected to create between 400 and 800 jobs and result in between \$4 million and \$100 million in private investment within the Ridgway Industrial Park. This project consists of infrastructure development within Ridgway Industrial Park and would provide access to eight lots in the industrial park with a total area of 72 acres available for development. The project consists of two parts:

1. Improvements to Heath Toffee Avenue storm sewer to alleviate flooding
2. Extension of road, water and sewer into the Industrial Park

Improvements include the extension of W. Mulberry Street approximately 2,280 feet west of Heath Toffee Avenue with new 30' face-to-face of curb concrete pavement on a lime stabilized base, 2,140 feet of 6" water main, 3,000 feet of 6" to 8" diameter sanitary sewer main, one duplex sanitary pumping station, and 5,114 feet of storm sewer ranging in size from 12" to 60" diameter.

**March 10, 2009 Rock Island Listening Session**

*Bi-State Regional Economic Development District CEDS, Western Illinois Economic Development District, Blackhawk Economic Development District*

<b>Group Recommendations</b>	<b>Corresponding CEDS Project</b>	<b>Comments</b>
<i>Regional land use planning</i>	<i>East Moline Land Use Analysis</i>	<i>The study will include an environmental assessment to identify environmental issues in the area and possible mitigations.</i>
<i>Protection of critical infrastructure</i>	<i>Eastern Iowa Industrial Center Rail transload facility</i>	<i>The transload facility will provide access to rail transportation to industries not located on a rail line, or with limited access to rail lines during the flood season.</i>

The following is a more detailed description of projects submitted by the respective economic development district that align with the goals identified during the listening session.

**Bi-State Economic Development District**

<b>County</b>	<b>Project Type</b>	<b>Project</b>	<b>Estimated Cost</b>	<b>Rating of Recovery Value</b>
Rock Island	Economic	East Moline Economic Development Land Use Analysis	\$100,000	High
Scott	Infrastructure	Eastern Iowa Industrial Center (Davenport) Infrastructure	\$4,315,000	High

Bi-State presented two priority projects that meet all the criteria for high value projects and are confirmed through other federal, state and local planning documents such as the FEMA Hazard Mitigation Plan. The Industrial Center presents a new opportunity to improve transportation functionality for the region, minimizing any disruption caused by flood events. In addition, the facility will expand transportation options for the region. The land use planning project presents perhaps a more localized benefit, presenting a new opportunity for integrating natural features into business district development.

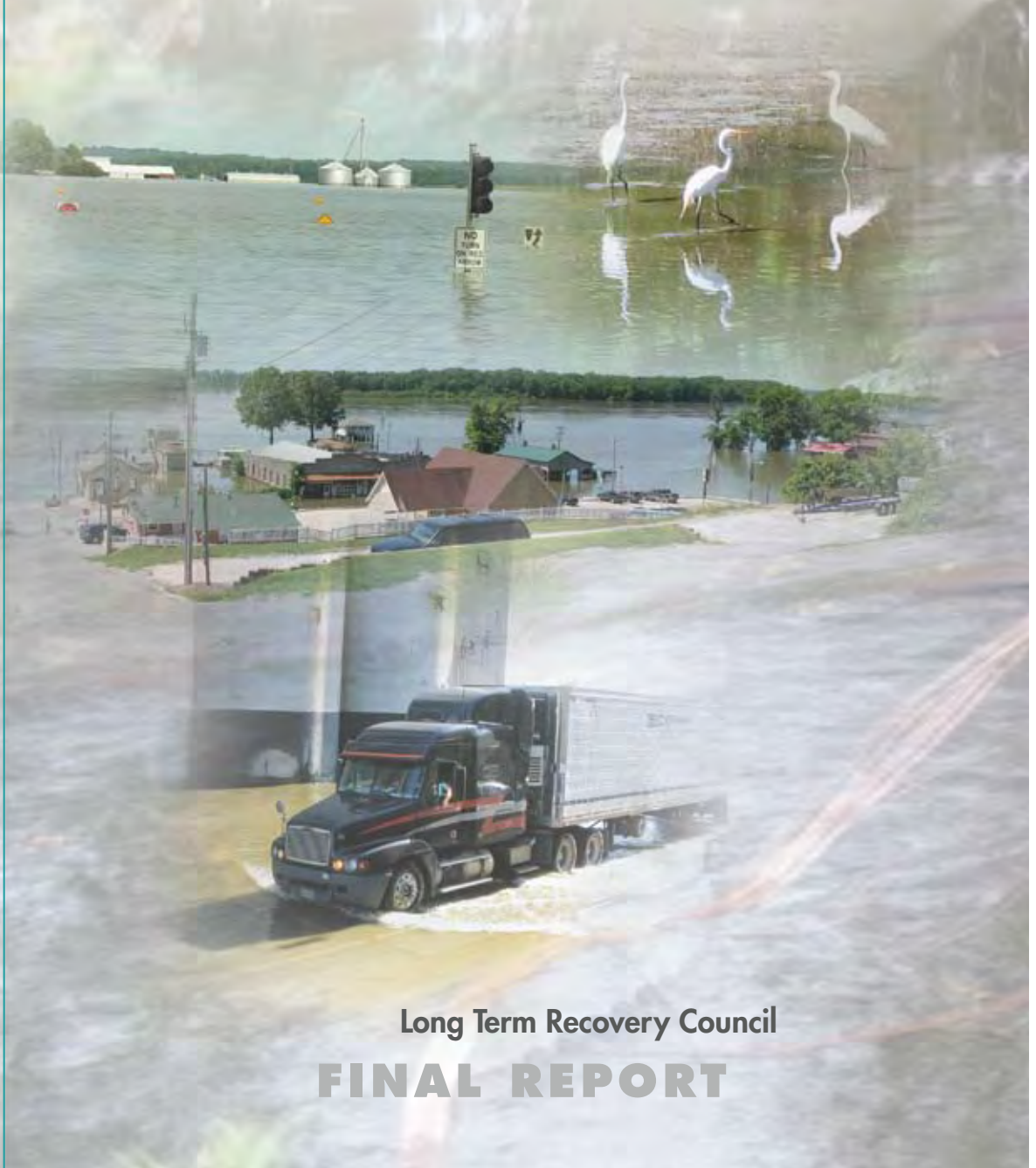
**East Moline Economic Development Land Use Analysis:** The City of East Moline, Illinois applied on May 22, 2009, for planning assistance under the 2008 disaster funding opportunities. East Moline has proposed using \$75,000 in federal assistance and \$25,000 in local funds to conduct an economic development land use analysis. The study area will consist of 2,200 acres of newly annexed land on the city’s eastside. The study will include an environmental assessment to identify environmental issues in the area and possible mitigations. Additionally,

the study will determine the types of industry most likely to be attracted to the area based on its environmental and economic qualities.

**Eastern Iowa Industrial Center (Davenport) Infrastructure:** The City of Davenport, Iowa is in the process of applying for EDA funding to assist in building a rail transload facility at the Eastern Iowa Industrial Center (EIIC). The transload facility will provide access to rail transportation to industries not located on a rail line, or with limited access to rail lines during the flood season. The EIIC is a 300-acre industrial park located along I-80. The City is seeking EDA assistance in the amount of \$4,315,000 for funding of the infrastructure improvements, extension of Hillandale Road, and utilities and stormwater detention. This application is being made under the disaster-related funding opportunities of 2008.

## Section C

Changes Necessary to Mitigate the  
Impact of Future Disasters and  
Ensure Rapid Recovery from  
Future Disasters



Long Term Recovery Council

**FINAL REPORT**

CHAPTER V – SECTION C: CHANGES NECESSARY TO MITIGATE THE IMPACT OF FUTURE DISASTERS AND ENSURE RAPID RECOVERY FROM FUTURE DISASTERS

Floods are predictable natural disasters. Thus, there are options for reducing exposure to the consequences of flooding. This is not a simple or straightforward task, as there are a number of factors to explore: the science, climate change, government programs, local interests, and the role of the federal, state and local governments. If we are to reduce our exposure to the consequences of flooding, thereby reducing risk and building flood resilient communities, there are a number of diverse issues that must be addressed.

*Climate Change, Floods, and Future Flood Risk*

Conventional estimates of flood probabilities (e.g., the 100-year flood—the flood that has a 1% probability of occurring in any given year) are based on available river gage records and assume that the climate in the future will be the same it was during the period of record. However, evidence from historic data, prehistoric data, and from regional climate models suggests that precipitation, run-off, and flood frequencies have changed in the past and could change in the future. The changes probably will not be uniform over the entire year. The upper Midwest will probably be drier in the summer and fall than it typically is at present, but there may be more precipitation and more rain or snow in the winter and spring (Wuebbles et al., 2009). The evidence and the implications for flood damage mitigation are summarized below.

- **Records from the upper Illinois River**, a major tributary of the Mississippi River upstream from East St. Louis and Alton, indicate that rainfall, run-off, and flood frequencies and durations have been increasing over the past several decades (Singh and Ramamurthy, 1990). Over a broader area of the Midwest, heavy rains are now twice as frequent as they were a century ago (Kunkel et al., 2008). Also, summer and winter precipitation have been above average for three decades, the wettest period in a century (Kunkel et al., 2008).

If these changes are related to global warming, the current regional trends are likely to continue (see third bullet below). However, if the changes are related to the well-documented phenomenon of local increases in rainfall triggered by emissions of particles from adjacent urban areas (the particles furnish nuclei for the formation of rain drops, see Changnon 1981), precipitation might decrease if particle emissions decline in association with air quality improvements.

Note that any increases in flood heights attributable to climate change are above and beyond increases attributable to loss of wetlands, additional development of impervious surfaces (roofs and parking lots), channelization of streams, and constriction of rivers and their floodplains.

- There is **geologic evidence** that modest increases in temperature have had dramatic effects on river flows in the upper Midwest in the past. Based on these past relationships, Knox (2009) concludes, “There is a reasonable probability that the 21<sup>st</sup> century Upper Mississippi River will be characterized by a high variability flow regime that contains an



anomalous high frequency of large floods separated by episodes of small floods and occasional very low flows during short-term droughts.”

Sediment cores from the Mississippi River and the Gulf of Mexico record several episodes of “megafloods” in the Mississippi River (flows equivalent to what might be regarded as 500-yr floods today) — the two most recent occurring about 1,000 BC and sometime between 1250 and 1450 AD (Knox 1993; Brown et al., 1999). Knox (1993) concludes that these episodes were triggered by increases in mean annual temperatures of only 1 to 2<sup>0</sup> C and changes in mean annual precipitation of only 10 to 20%, which is within the increases projected to occur in this century (Wuebbles and Hayhoe, 2004).

- **Climate models** suggest that precipitation in the Upper Midwest region will increase from 2009 through 2099 during the winter and spring, with summer rainfall remaining the same or less (Wuebbles and Hayhoe, 2004; Wuebbles et al., 2009). The number and magnitude of flood events is likely to increase because of an increase in summer storm events. Jha et al. (2004) predicted that increases of 21% in precipitation from the 1990s to 2050 would increase stream flows by 51% in the Upper Mississippi River Basin, because rain would more frequently fall on near-saturated soil and generate more run-off.

#### *Implications for Flood Risk Reduction*

The implications of these studies are that flood protection measures whose designs are based on river gage records for the last hundred years may not actually provide the protection implied by “50-yr”, “100-yr” and “500-yr” design designations.

#### *Brief Background on Current Flood Identification and Floodplain Management Practices*

There are science and engineering tools to predict extent, depth, and frequency of flood inundation. In support of the National Flood Insurance Program (NFIP), Flood Insurance Rate Maps (FIRMs) have been prepared statewide and nationwide. FIRMs depict the extent of inundation that has a 1% chance of occurring in any given year (a.k.a. the 100-year flood); the extent of inundation that has a 0.2% chance of occurring in any year (a.k.a. the 500-year flood) is also depicted if the data is available. Communities that participate in the NFIP adopt floodplain management ordinances that direct development to minimized flood losses and/ or require flood proofing or other adaptations to minimize flood risk in the floodplain associated with the 1% annual chance flood (ACF). Flood insurance through the NFIP is available only in those communities that participate in the program. Flood insurance is required for structures in the 1% annual chance floodplain when the structure is used as collateral for federally back loans. However, even with this information, the severe consequences of flooding continue.

The 1% ACF was chosen to serve as standard for setting flood insurance requirements. The FIRMs are used to determine what flood zone a structure is in, and the FEMA flood insurance manual is used to determine the appropriate flood insurance premium. It was never intended to serve as a safety standard (Association of State Floodplain Managers, 2004). Floods larger than the 1% ACF occur regularly. The false belief that if you are not subject to the 1% ACF has created vulnerabilities to larger floods (e.g., the 0.99% ACF or the 101 year flood). In other

words, there is a misconception that if a property is located out of the Special Flood Hazard Area (SFHA) the property is safe from flooding. In fact, 25% of all flood insurance claims come from areas outside the SFHA. There is a false sense of security behind the line on a floodplain map depicting 1% ACF or a levee accredited with providing protection. Contributing to this false sense of security is that federal floodplain management regulations stop at the boundary of the 1% ACF. The minimum NFIP standard for floodplain management is confined to the SFHA for development and the 500-year floodplain for critical facilities. Although, this does not preclude communities from adopting higher standards if they so choose. Furthermore, the accuracy of current flood hazard mapping in Illinois is highly variable. Many counties and communities have only approximate assessments of flooding extent. A great number of the detailed flood studies which are the source for flood hazard mapping are decades old and do not reflect today's landscape. They certainly do not anticipate tomorrow's development. Communities have a requirement to submit new technical data if they feel that the floodplains depicted on the FIRMs do not accurately reflect true flood risk. However, this process is not widely utilized.

The Illinois Department of Natural Resources' Office of Water Resources (IDNR/OWR) carrying out statutory mandates has set Illinois' standard above the minimum federal requirements (<http://dnr.state.il.us/OWR/>). The OWR's strong history of floodplain management has benefited Illinois and reduced flood exposure. Flood hazard maps (FEMA's FIRMs) are a basic tool used by IDNR/OWR to identify those areas where floodplain management directives apply. Accurate and up-to date identification of flood hazard areas is fundamental to floodplain management.

Structural measures, such as levees, have traditionally been relied upon to provide protection from flooding. Currently, areas behind levees accredited to withstand 1% ACF are not subject to mandatory flood insurance or floodplain management requirements. Although, FEMA recognizes that there is residual risk and strongly recommends purchasing flood insurance in the areas behind levees. It has been clearly demonstrated during the 1993 floods and 2008 floods, that when levees fail, the damage is catastrophic when there have been investments made in areas thought to be safe (structures and supporting infrastructure). Hemming in our floodplains leads to other negative consequences such as higher flood elevations due to loss of natural function of floodplains, degradation of habitat, and potential property rights violations as floodwaters are directed onto someone else's land. When a levee is damaged during a flood, current practice as supported by federal programs (US Army Corps of Engineers, Public Law 84-99 Program) is to rebuild the flood-damaged levee to pre-flood condition. The idea being to secure the area as soon as possible before another flood occurs. This provides near-term flood protection; however this practice only increases the investment in the floodplain and does not reduce future risk. Building levees encourages urban development because of the perception that the area is now "safe" from flooding. The American Society of Civil Engineers (ASCE) (2009) has recently released a policy paper regarding levee certification stating "... risk communication is especially important in situations such as levee construction where the community is often emboldened by an erroneous sense of security to greatly increase development in areas protected for a time by levees; and at the same time the consequences of such failure have dramatically increased due to flood depth and velocities which accompany such failures."

It is important to make a distinction between levees that protect agricultural areas and levees that are designed to protect urban (developed) areas. Agricultural levees are constructed to reduce the frequency of inundation in areas that are used for crop production, thus increasing long-term production from the land. Agricultural levees have typically been constructed to protect from floods with a magnitude on the order of the 2% ACF (50-year flood.) The consequences of an agricultural levee being overtopped (which is not considered a failure) are a season's production loss. While significant, this consequence is not of the same order of magnitude as the loss of life or permanent property or businesses damages. However, development, such as construction of homes and business, has occurred behind levees that were initially built to protect agricultural areas. In some places these levees have been "improved" to achieve the minimum level of protection (for a 1% ACF) to avoid the requirements of flood insurance and floodplain management. This promotes a cycle where levees are constructed to meet minimum 1% ACF (a.k.a. 100-year flood) protection standards to remove the "protected area" from floodplain management and flood insurance requirements. However, this encourages development which increases the risk. When greater floods occur (e.g. the 0.99% annual chance flood, a.k.a. the 101 year flood), the consequences are catastrophic — with lives at risk and uninsured, unprotected property destroyed.

### *Uncertainty in Flood Hazard Exposure*

Floods will continue to occur, potentially with greater frequency and severity than existing analyses indicate. It is critical to take into account the likely extent of flooding in the future given the uncertainty of our predictions now and the impacts of change.

Estimation of flood frequency and magnitude requires accurate data. The geographic and temporal extent of precipitation and streamflow records are key to the accuracy and reliability of the flood estimates. Land cover and topographic data are equally important inputs to estimating flood magnitudes and extent. A recent study by the National Academy of Sciences (2009), *Mapping the Zone, Improving Flood Map Accuracy*, clearly calls for investment in high resolution topographic data such as lidar as an essential element for accurate identification of flood hazards. The number of stream gaging stations in Illinois has steadily decreased since early 1980 due to declining United States Geological Survey (USGS) appropriations for the stream gaging program. Many of the stream gaging stations in Illinois are operated under a cost-sharing agreement with the USGS. The USACE and the IDNR/OWR are major sponsors, and several local governments also sponsor gages. Illinois' stream gaging network does not meet all the needs and uses for streamflow data in Illinois. Throughout most of Illinois, topographic data does not have sufficient resolution for accurate analyses, it is decades old, and does not represent current conditions.

The FIRMS produced by FEMA are the basis for permitting, planning, and floodplain management. Throughout most of Illinois, the floodplains depicted on the maps are based on aged analyses, but even updated analyses represent only existing conditions. (This is because the first purpose of FIRMs is for flood insurance determinations and must be based on existing conditions.) These limitations are 1) stark in the light of development changing the landscape and runoff patterns, and 2) climate change that is highly likely to increase the future magnitude and severity of flooding.

While we have analyses tools, common practice, and often required practice, is to make the assumption that hydrologic conditions will be the same in the future as during the period of record (usually the past 50 to 150 years). Although this is the best approach for now, the science of predicting the frequency and magnitude of future floods will likely improve as the flood record is extended into prehistory (through the techniques of paleohydrology), and as effects of climate change are taken into account in rapidly-improving regional climate models.

Reducing the consequences of flooding now, and into the future, requires action now that goes beyond standard practices and Illinois' requirements. It is vital to identify measures that can be used to reduce exposure to flood damages and thereby reducing risk. In view of the uncertainty about the effects of climate change on flooding, it is prudent to err on the side of safety in adopting the recommendations listed below.

### *Considerations for Building Resiliency for the Future*

The life threatening consequences of flooding can be reduced through flood forecasting and warning, evacuation and response plans, and public awareness. Flood forecasts are based on real time gage and modeling tools. Great strides have been made in forecast models, but these are limited to network of precipitation and stream gaging stations. IDNR/OWR works with the National Weather Service and the USGS to maximize existing resources. The Illinois Emergency Management Agency (IEMA) has a team of professionals for emergency response. Preparedness is a local responsibility. IEMA has an excellent web site providing information on preparedness: <http://www.state.il.us/iema/disaster/disaster.htm>. However, these measures do not mitigate the impact of flooding on damages to homes, businesses, and local economies.

Solutions that will reduce risk in the future should be the keystone of public policy. Risk is a product of the frequency of the flood event and the negative consequences of flooding. Flooding is part of nature, floods will continue to occur, but decisions can be made to reduce negative impacts. Too often, short-term economic gains from floodplain development lead to long-term negative economic and social impacts (Association of State Floodplain Managers, 2008b). Good floodplain management leads to both short term and long term benefits to the community and the state.

### *Tools for reducing exposure to floods and increasing resilience.*

Comprehensive, coordinated watershed planning can provide a road map for effective reduction of risk. A tool for managed flooding during major floods would be to purchase rights to flood levee-protected agricultural areas through a voluntary program. Managed flooding has the potential to reduce the risk of levee overtopping or failure in urban areas, as well as reduce the damage to the entire levee system by having designed overflow areas. This concept is explored for the Illinois River in two reports: 1) Managed Flood Storage Option for Selected Levees along the Lower Illinois River for Enhancing Flood Protection, Agriculture, Wetlands, and Recreation, First Report: Stage and Flood Frequencies and the Mississippi Backwater Effects (Singh, 1996), and 2) Managed Flood Storage Option for Selected Levees Along the Lower Illinois River for

Enhancing Flood Protection, Agriculture, Wetlands, and Recreation, Second Report: Validation of the UNET Model for the Lower Illinois River (Akanbi and Singh, 1997).

Mitigation efforts can and do reduce flood risk. There are a variety of actions that can be taken that reduce the consequence of flooding, including, but far from limited to: buyouts of flood damaged buildings, elevating buildings in flood hazard areas, and elevating utilities. The IEMA has an extensive web site providing information on mitigation:  
<http://www.state.il.us/iema/planning/planning.htm>.

Illinois has been highly successful in pursuing the purchase and/ or relocation of structures in high hazard areas. Success stories include Valmyer, Grafton, and Keithsburg where residential buyouts after the 1993 flood reduced losses to individuals, the State of Illinois, and all taxpayers in 2008.

Individuals can reduce their personal risk by elevating valuables, utilities and appliances (furnace, air conditioner, electrical hook-ups, washer and dryer, etc.). Business and government can flood proof buildings and elevate utilities, generators, public records and valuable collections. The Federal Emergency Management Agency (2009) has a number of publications to assist individuals and communities to be prepared.

Levee failures in Illinois have resulted in major damages to structures and communities. It is erroneous to believe that an area behind a levee is safe from flooding. Where possible, alternatives should be investigated so that reliance on levees or other structural barriers to flooding can be reduced. Removing or setting back levees has the further benefit of enlarging natural habitat areas that serve to store floodwaters, thus lowering flood risk downstream. “The [Interagency Levee] task force is currently evaluating several potential non-structural alternatives for floodplain management: the Louisa County, Iowa, Levee District 11; the St. Charles County, Missouri, Kuhs Levee; the Grand Tower and Vandalia Drainage and Levee Districts in Illinois; and Gulfport, Illinois.” (United States Army Corps of Engineers, Interagency Levee Task Force, 2009). The National Committee on Levee Safety (2009) calls for strong state levee safety programs.

Relocation or protection of critical facilities (potable water, waste water treatment, fire and police stations, transportation routes, etc.) reduces infrastructure damage and minimizes interruption of services. Vulnerable public facilities (hospitals, nursing homes, etc.) should not be located in areas subject to flooding. Existing facilities in flood hazard areas should be flood-proofed.

Floodplain management is a tool to minimize ongoing investments in the floodplain. Enforcement of floodplain management ordinances guides development away from flood prone areas. Post flood events, substantially damaged properties that remain in the floodplain must be adapted through elevation of structures and/or utilities which reduces future damages and speeds recovery.

Flood insurance is available in communities that participate in the NFIP. The purchase of flood insurance should be encouraged, and not viewed as a burden for those who choose to locate

structures in flood-prone areas. It is a benefit that the federal government makes low cost insurance available.



**Harrisburg, Illinois** did not participate in the National Flood Insurance Program and allowed development in the floodplain. The community experienced damaging flooding in March of 2008. No structures were insured against flood losses. (Photo courtesy of Harrisburg Daily Register <http://www.harrisburg-il.com>.)

Assessment, mapping, and floodplain regulation of future conditions (e.g., maximum build out/ climate change, etc.) in urban and urbanizing areas will reduce current and future flood risks.

It is vital to clearly communicate to the public and local governments that flood prone areas are at risk, and that it is in their interest to take measures to reduce their exposure in a sustainable manner. No amount of disaster assistance compensates for the trauma, disruption and losses due to flooding. This is especially true of areas behind levees. Levees will fail or be overtopped when the design flood is exceeded. Investment in levees creates a future obligation for maintenance and repair, and losses when they fail. If an economic benefit is gained from the construction, rehabilitation, and/ or maintenance of a levee, then the full cost of the levee work, including repair of levees which have been damaged by floods exceeding their design, should be born by those parties enjoying the economic benefit. The economic benefit to one group should not be achieved by externalizing the cost of the levee to others (e.g. taxpayers, etc.).

### *Take Responsibility*

Those who choose to live in high risk areas, or profit from development of high risk areas, should bear the burden of that risk and not pass it on to the taxpayer or the next generation. This externalization of costs encourages risky behavior. These concepts were clearly articulated in the USACE report “Sharing the Challenge”, often referred to as the Galloway report (Interagency Floodplain Management Review Committee, 1994).



Citizens need to understand true risk and exposure. Public assistance after a disaster does not make one whole again and insurance does not cover the loss of personal items, or interruption of work or business activity. Individuals should consider options for reducing consequences of flooding.

State and local governments need to take the lead on managing floodplains. “The authority to determine how land is used in floodplains and to enforce flood-wise requirements is entirely the responsibility of state and local government” (Major Gen. Don Riley, USACE). The following list is not all inclusive but points to actions that state and local governments can take to buy down risk and reduce Illinois’ losses to flooding.

***Local officials:***

- NIFP participation and full compliance with requirements
- Adopt No Adverse Impact (Association of State Floodplain Managers, 2008b)  
<http://www.floods.org/NoAdverseImpact/whitepaper.asp>
- Develop Hazard Mitigation Plans and incorporate them in Zoning or other community plans
- Encourage the purchase of flood insurance

***State Legislators & Executive Office:***

**Support unified approach to flood risk reduction.**

- Strictly enforce Illinois Executive Order 2006-05 *Construction Activities in Special Flood Hazard Areas*, filed March 07, 2006.
- Align Illinois agencies, such as those involved with economic development, to incorporate hazard mitigation and floodplain management requirements in their programs.
- Review and consider the USACE’s Illinois Interagency Levee Work Group policy white paper for recommendations on needed policy and process change (2009, In Progress). The Interagency Levee Task Force (ILTF) enacted after the 2008 floods proved successful in coordinating activities and should remain active. (Note that work of the ILTF will be carried on by the Regional Flood Risk Management Team, whose charter is expected to be signed on September 1, 2009, at the first scheduled meeting of the Team.) The ILTF also identified problematic issues with current programs. One recommendation is that “alternatives for reducing vulnerabilities should be considered for all levees to be repaired under the USACE Public Law 84-99 Program, FEMA Public Assistance program and the Natural Resources Conservation Service, actions such as permanent evacuation of flood-prone areas, installation of flood warning systems, and/ or creation of natural and artificial flood water storage basins” (United States Army Corps of Engineers, Interagency Levee Task Force, 2009).

## **Plan**

- Strengthen the Illinois Hazard Mitigation Plan with vetted plans that use resources to reduce risk. Specifically, plans should be prepared for post-disaster recovery actions that reduce future risk.
- Identify potential funding mechanisms and be ready to implement plans to reduce risks both before and after floods (e.g., PL84-99, FEMA Public Assistance 406, Emergency Watershed Protection Program, Wetland Reserve Program, Community Development Block Grants, NFIP Hazard Mitigation Grant Program)
- Initiate a statewide effort to ensure that all communities develop Hazard Mitigation Plans as required by the Disaster Mitigation Act of 2000. Help communities identify risk and use grants to reduce exposure. Encourage communities to incorporate mitigation plans in economic/ land use / zoning plans.

## **Flood-proof Policy**

- Reserve structural protection for areas with no other options and build to at least 0.2% protection level where lives are at risk. Do not invest public funds in areas at risk of flooding.
- Require the purchase of flood insurance for all structures behind FEMA accredited levees before issuing permits for levee work. An option would be to gain assurance of the purchase of minimum flood insurance for structures behind the levee. The option for the levee owner to include the cost of flood insurance as part of the levee assessment should be explored.
- Support a strong program of floodplain management by fully staffing the NFIP coordinator's office. Positions are paid through FEMA grants.
- Support data collection and studies to improve predictive capabilities, both for flood mapping and forecasting, and to improve regional climate models (e.g. Illinois Height Modernization Program and USGS streamflow gaging station cost share program).
- Establish future conditions assessments as the basis for planning and flood hazard mapping.
- Communicate flood risk, options for reducing risk, and responsibilities in a meaningful manner to target groups.
- Re-evaluate Illinois' executive support of the Upper Mississippi River Study Alternative M (United States Army Corps of Engineers, 2008). The report calls for more study, and Alternative M is not the recommended option. Alternative M includes extensive levee construction without considering mitigation or impacts on risk, the environment, or flooding.



### **Improve predictive capability and reduce uncertainty.**

- Determine whether the state of the science is such that methods for estimating flood frequencies and magnitudes for the next 50 to 100 years should be revised based on observed trends in weather and stream gaging records, a 5,000-year flood record preserved in sediments, and rapidly-improving climate models. These recommendations are consistent with the recent report of the National Academies of Science and Engineering (2008). Illinois universities and the Illinois Water Survey should undertake analysis and modeling for the upper Midwest region.

### **Evaluate the consequences of underestimating flood risk.**

If the above analysis indicates that current prediction methods underestimate future flood frequency and severity, then lives and property will be at greater risk than currently estimated. The following questions need to be addressed: 1) If floods come more frequently in the future, can the current flood management system adapt?, or 2) Do decisions made using current assumptions foreclose options for adaptation should flood frequencies change?

Once high-value investments are made in flood-prone areas, it would be expensive and disruptive to later require more land to build earthen levees higher (and wider), rebuild flood walls, or to move people and structures out of the area. The costs and disruptions for additional protection of agricultural lands would presumably be less, because of the lower cost of additional land for wider, higher levees. The land provided for the levee by the landowners is usually counted as part of the required local cost-share. The benefits of raising the elevations of agricultural levees would have to be weighed against the loss of local flood storage and conveyance capacity during major floods. Akanbi et al. (1999) found that if just 14% of the floodplain along a 120-mile reach of the lower Illinois River were utilized to store flood crests, an additional 44% of the floodplain would gain protection from a 100-year flood. Incentives would have to be provided to landowners and levee districts who were willing to accept floods in order to reduce flood damages elsewhere.

### **Evaluate the consequences of overestimating flood risk.**

The main consequences of over-estimating flood risk are: 1) some development that might have occurred will be forestalled, and 2) flood protection structures, such as levees, will be more costly because they will have to be higher and stronger. Note that the extra cost is not “wasted”—it buys protection from flooding that can occur, just not as frequently as predicted.

### **Err on the side of caution.**

At the very least, the evidence cited above suggests that flood management policy should err on the side of caution (assuming large floods may occur more frequently than currently projected).

A comprehensive flood management system that includes managed flooding of some areas to reduce flood crests, improved flood forecasting and evacuation procedures, and levee improvements only in highly developed areas or where lives are at risk will be more adaptive to change and preserve more options than a structures-only approach.

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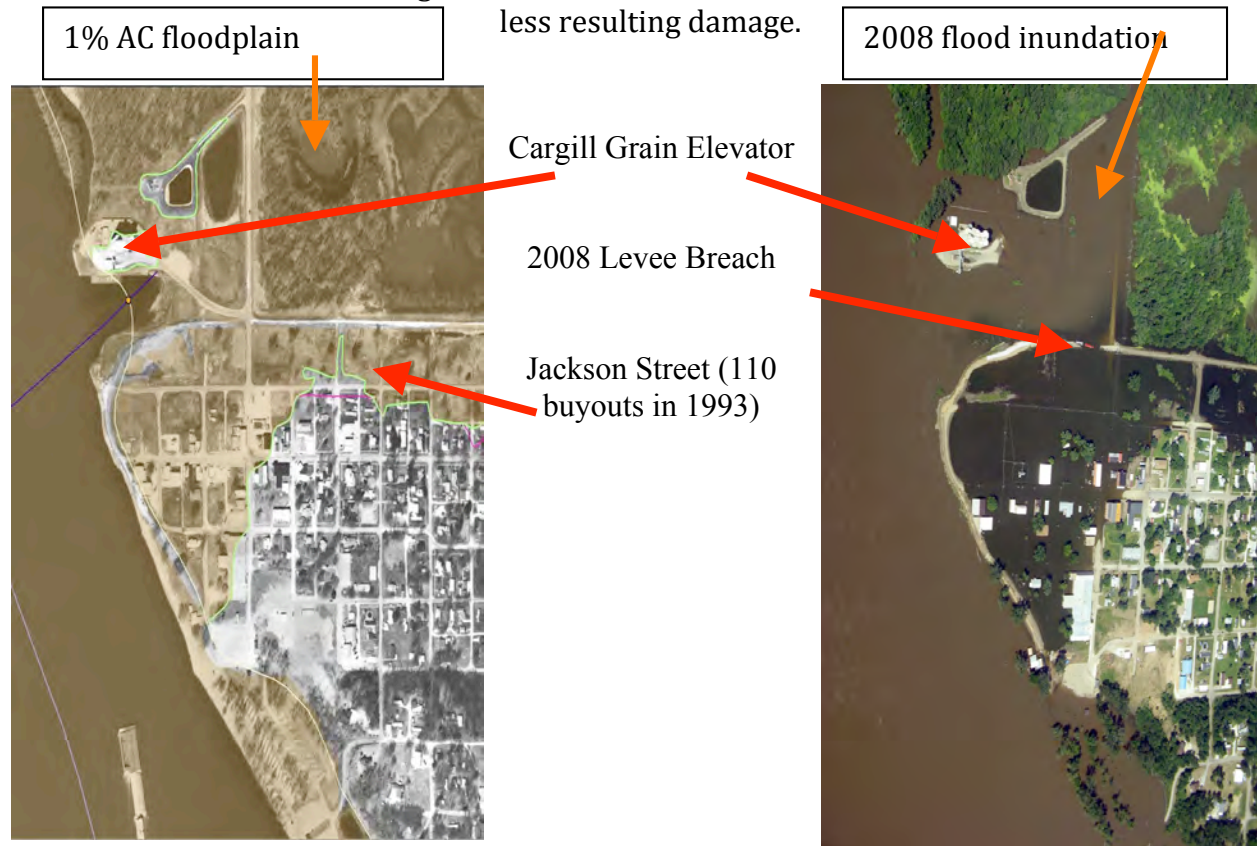
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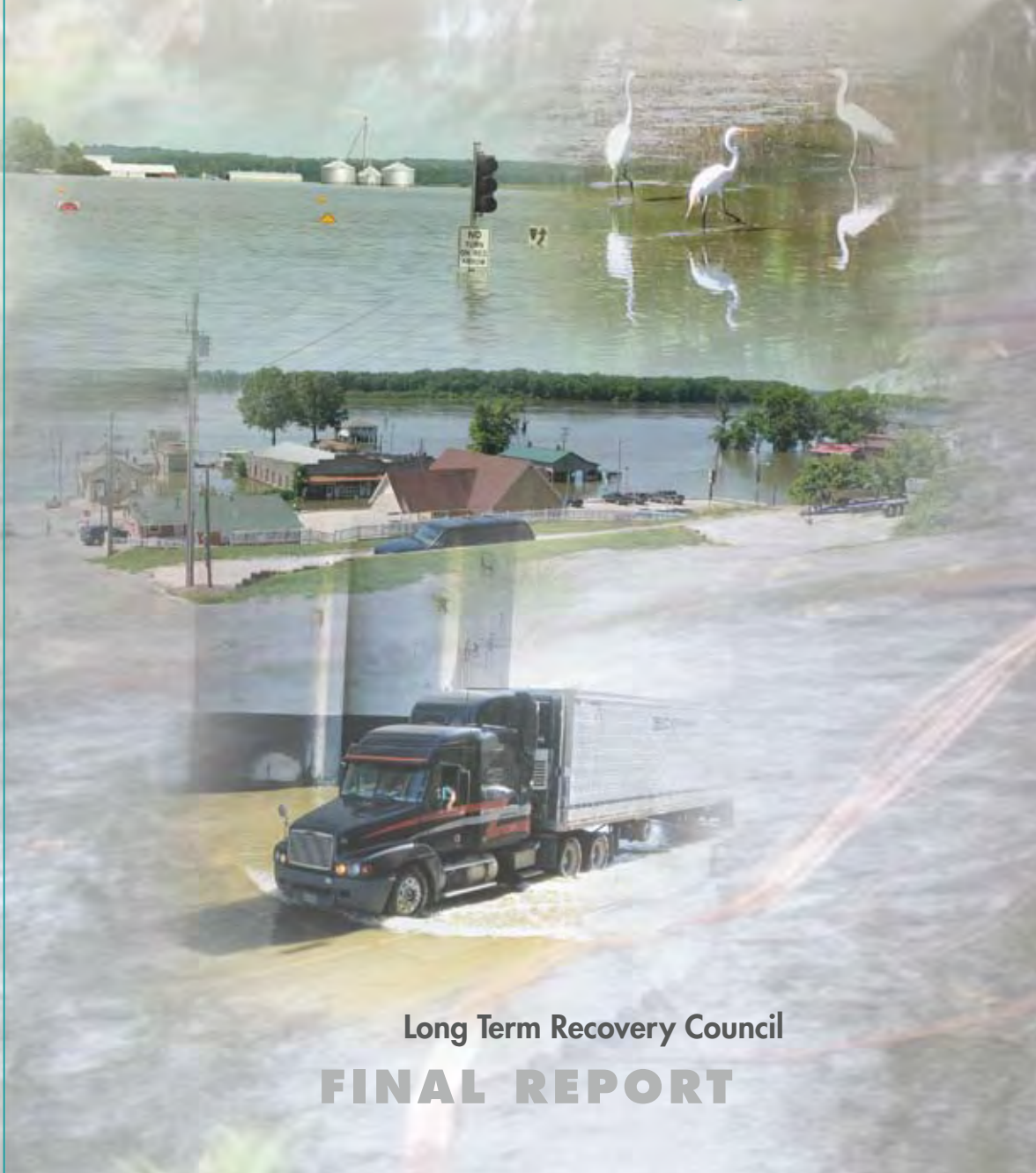
### Supplemental Materials:

After the 1993 floods, FEMA Hazard Mitigation Grants were used to purchase 110 structures in Keithsburg, Illinois. The same area was flooded in 2008, with much less resulting damage.



## Section D

Recommendations Involving Legislative,  
Regulatory, Policy, or Funding  
Changes That May Apply at Any  
Level of Government Oversight



Long Term Recovery Council  
**FINAL REPORT**

CHAPTER V – SECTION D: RECOMMENDATIONS INVOLVING LEGISLATIVE, REGULATORY,  
POLICY, OR FUNDING CHANGES THAT MAY APPLY AT ANY LEVEL OF  
GOVERNMENT OVERSIGHT

*Defining the Policy Focus*

Flooding creates risks for individuals, families, their livelihood and assets, and communities as a whole. When flooding occurs, whole communities can be destroyed in an instant. At the least, flooding can have severe economic impact on individuals and communities. The cost of rebuilding can be significant and does not preclude the same area being flooded again in the future. At the same time, riparian communities serve a vital and important function to states and to the nation as a whole (Interagency Floodplain Management Review Committee, 1994).

While many attempts have been made to regulate and control both the flow of water and how that flow impacts adjacent communities, much work lies ahead to develop strategies focusing on long-term recovery. A comprehensive, action-based approach to policy development designed to mitigate flooding and its impact is critical now as Illinois and its bordering states continue to lose valuable resources with each flood event. Even more challenging is how to create a comprehensive approach to long-term recovery within the framework of Illinois' complex policymaking infrastructure. Clearly, a truly comprehensive approach can only be achieved with an eye towards shared responsibility and governance—not by the federal government “going it alone” (Interagency Floodplain Management Review Committee, 1994).

In order to design a comprehensive system it is useful to analyze each layer of the policymaking infrastructure on its own. Relying on a socio-ecological model to evaluate the needs of individuals and communities can be useful. Many academics and planners have used this tool as a useful means by which to assess and analyze assets and liabilities and to develop strategies for effective and efficient implementation for revitalization.

Most importantly, the flow of water does not, and cannot, follow the man-made boundaries governing land use. The complex myriad of municipal, township, county and district boundaries can wreak havoc when attempting to design a comprehensive, proactive approach to long-term issues such as flooding. Particularly in Illinois, where there are over 6,000 units of local and regional government, attempting to design a flood mitigation recovery system becomes a monumental task, as each governing board must be convinced of the significance of collaboration and cooperation with overlying and adjacent governing structures.

In order to have success, policymaker awareness is essential. Legislators and other policymakers at all levels—local, regional, state, and national—determine the government's priorities for flooding and stormwater management and mitigation. Scarce human and financial resources require public policymakers to make difficult choices, often sacrificing those stakeholders most in need. The policymaking structure varies from locale to locale. The degree to which state legislatures permit local and regional

authorities to exercise local control can determine how localities address the risks associated with flooding and stormwater management and mitigation support, treatment and prevention, as well as training and education, in the community. Mapping policy assets is key to an effective assessment.

At the core is the flood management infrastructure. Who governs local and regional flood prevention and water management, how are they funded, and ways in which resources are deployed are critical questions. In addition, broader inquiries relating to publicly supported critical and long-term infrastructure must be made to establish an inventory of public resources. As the analysis broadens further, an asset map of public education, local and regional land use planning and zoning authorities, community and economic development, and human services entities should also be catalogued. At the center of the inquiry, a review of the governmental structure, (i.e., how public revenues are generated and distributed through national, state, regional and local governments to address flooding and flood mitigation) must be determined. As important, the methods by which leaders of those structures are selected and influenced should be mapped. The analysis is both objective and subjective. Objectively, assessing how laws, regulations and policies are made and changed is key. At the same time, an anecdotal analysis of which policymakers have a specific interest and motivation to take the lead in promoting prevention and treatment policies should be determined.

### ***Policy Assumptions***

- Floods are predictable natural disasters.
  - There are engineering tools to predict extent, depth, and frequency of inundation and the uncertainty limits of those estimates, yet flood damages continue to occur.
- Proactive approaches to disaster mitigation are necessary for successful long-term recovery planning and implementation.
- FIRMs show 1% ACF & 0.2% ACF. However, the 1% ACF was intended to set flood insurance rate; it is not an adequate safety standard.
- Distinction between agricultural levees and those in urban or urbanizing areas.
- Structural measures, such as levees, have traditionally been relied upon to provide protection from flooding.
- When levees fail, the damage is catastrophic because of investments made in areas thought to be safe.
- Hemming in our floodplains leads to other negative consequences.
  - Higher flood elevations due to loss of natural function
  - Degradation of habitat



- Property rights violation as it moves the floodwaters onto someone else's land
- Hazard Mitigation Plans are the appropriate framework for long-term recovery planning and implementation.
- Current practice is to rebuild levees to pre-flood condition (PL 84-99) for near-term flood protection. However, this practice only increases investment in the floodplain and does not reduce future risk. Building levees encourages development because of the perception that the area is now “safe” from flooding.
- Floods will continue to occur, potentially with greater frequency and severity. There is a need to identify measures that can be used to reduce exposure to reduce the consequences of flooding, thereby reducing risk.
- The life threatening consequences of flooding can be reduced through:
  - Evacuation and response plans
  - Public awareness
  - Flood warning (flood forecast based on real time gage monitoring)
 (The three categories listed above are IEMA and local responsibilities.)
- Short-term economic gains from floodplain development lead to long-term negative economic and social impacts. Good floodplain management leads to both short-term and long-term benefits to the community and the state.

### ***Community-Based Action***

Because of “jurisdictional competitiveness”, it is important to start any action-oriented policy model for addressing the land use and economic development impacts of flooding at a very local level. Unless local officials, and the constituents that elect them, understand how their policies and practices impact communities downstream, a comprehensive approach will not be effective.

From a local governing and land use perspective, Illinois is divided into incorporated and unincorporated areas. While the Illinois Municipal Code, 65 ILCS 5/1-1-1, provides the general framework for municipal governance, many other laws found in the Illinois Compiled statutes impact the municipal governance structure. Municipal boundaries themselves are often gerrymandered to meet the needs of an individual landowner. Once land is annexed into a municipality, it is subject to the zoning and land use regulations adopted by the governing board of the municipality. Under the municipal code, these governing boards can take many different forms. Land located outside municipal boundaries is considered “unincorporated” and is subject to the zoning and land use regulations of the county in which the land is located (set forth in the Counties Code, 55 ILCS 5/1-1-1, discussed below). To make matters more complicated, each municipality

has “extraterritorial jurisdiction” over land use patterns within a mile and half of the municipal boundaries.

Flooding is directly affected by these local land use regulations, which can often be draconian and provincial. Issues including allowable land uses, density, infrastructure and population trends, all have a direct impact on flood hazards. In order to develop a comprehensive approach, the following must be accomplished at the municipalities:

- Identify key local/ municipal policymakers and stakeholders
  - What is the governance structure?
  - Is the municipality home rule?
  - What advisory commissions are established to assist in planning?
  - Who are the other community stakeholders, (i.e., grass roots constituency organizations, chambers of commerce, business associations, civic organizations, etc.) that can impact policymaking?
- Map and assess assets, liabilities and resources
  - What are the human resources that can be tapped to assist in both emergency preparedness and long-term planning?
  - What are the specific demographics of the community which may create assets or liabilities if flooding occurs?
  - What is the physical capital of the community and how would it be impacted by a flood event?
  - What is the community’s fiscal condition to react to a major flood event as well as to create long-term proactive mitigation approaches?
- Determine policy
  - Housing—zoning and land use control
  - Economic Development—incentives
  - Sustainability (environmental/ ecological)—Green jobs
  - Community capacity—physical resources
- Develop a Community Resilience Plan to maximize use of existing public/ private/ non-profit networks
- Partner with entities for technical assistance including Community College/ Regional Councils/ Extension/ Others
- Inventory/ Coordinate interagency efforts
- Seek opportunities for training local leaders
- Maximize existing statutes like River Edge Redevelopment Zone Act

## ***Regional Planning***

Illinois' regional land use governance, particularly as it relates to water management, is particularly complex. These come in all shapes and sizes, and the policies flowing within them flow at varying speeds. A quick glance at the Illinois Compiled Statutes identifies a number of public entities which have, or could have, "jurisdiction" over flooding and water management.

Structurally, Illinois counties have general land use and zoning jurisdiction over land that is not incorporated into a municipality. Elected county boards work with appointed regional councils and regional planning commissions. Many other entities also come into play based on the particular interest they represent. Examples of entities with direct jurisdiction over flooding and flood mitigation include: townships, levee districts, draining districts, and stormwater management agencies. Entities with indirect jurisdiction may also include airport authorities.

The Regional governance system as described above must play the lead role in flood recovery planning, flood mitigation, long term planning and risk management. Therefore it must:

- Utilize Regional Councils as lead structure
- Identify key regional policymakers and stakeholders to drive process
- Establish Long Term Recovery Command Center
- Inventory/ Coordinate interagency efforts
- Integrate GIS System
- Partner with entities for technical assistance including Community College/ Regional Councils/ Extension/ Others
- Determine proper post-event waste handling procedures

*A primary recommendation of the Long Term Recovery Study Group is that each county will prepare a Hazard Mitigation Plan to ensure efficient and effective short-term response and long-term recovery to flooding and other natural disasters. Hazard Mitigation Plans will be prepared utilizing best practices in consultation with all governmental and quasi-governmental entities having jurisdiction over any factor impacting the Plan (i.e., citizen stakeholder groups, business and industry leaders, and others).*

## ***State-wide Capacity-building***

The State must provide the necessary "collection and distribution point" for long-term recovery policy priorities. Multiple state agencies have jurisdiction over flooding and the concomitant responsibilities, ranging from rebuilding levees to providing emergency housing. In order for Illinois to be a nationwide leader in long-term recovery efforts, state agencies must collaborate and cooperate, sharing necessary and sufficient resources with local and regional entities.

*A primary recommendation of the Long Term Recovery Study Group is to create an Office of Long Term Recovery (OLTR) that will serve as the lead entity in designing and implementing recovery efforts at the local and regional levels. The OLTR will focus on community and economic development and technical assistance for hazard mitigation planning. This authority is supplementary and complimentary to existing local, regional, and state agency powers. The OLTR should convene a permanent multi-agency advisory committee to develop and maintain implementation plans for flood and other disaster recovery efforts with an emphasis on coordination between various government agencies. Recovery can be confusing and fast-paced, and requires coordination and rapid information flows at a level of urgency that differs from normal times.*

*More specifically:*

- *The OLTR will convene a multi-state agency working group to develop planning and implementation templates for flooding and other disaster recovery efforts, including long-term non-structural mitigation, with an emphasis on wrap-around service provision designed to spur economic growth after a disaster.*
- *Governance and operational structure of OLTR will be determined based on recommendations of a steering committee comprised of members selected by the Governor.*
- *Recommendations of the steering committee will be forwarded to the Governor's Office and legislative leaders in the form of draft legislation/ policy to create the OLTR.*
- *The OLTR will provide technical assistance to counties preparing Hazard Mitigation Plans. Specifically, OLTR will create an on-line clearinghouse of Best Practices, and will work with Counties to identify governmental and quasi-governmental entities having jurisdiction over any factor impacting the planning process.*
- *The OLTR's budget will be supported through an array of funding streams.*

The following recommendations will support the initial implementation of the OLTR:

- Identify lead state agencies for disaster recovery, economic development, and natural resource protection, and establish a State Agency Triage Network including:
  - IEMA
  - IDNR
  - DCEO
  - DHS
  - IEPA
  - IDOT
- Coordinate with FEMA Federal Disaster Declaration Process

- Develop ranking system for prioritizing communities for state and federal assistance
- Inventory/ coordinate interagency efforts
- Develop education program for stakeholders
- Replicate Iowa model
- Hazard accounting
- Amend the Code of Federal Regulation to provide that all floodplain managers must have certification

### ***Midwest Multistate Planning***

Multistate approaches to long-term recovery from natural disasters are particularly critical. River basins cross state lines creating challenges and opportunities for states to work together on recovery approaches. States can rely upon each other's research and resources as they address policy priorities. While each state's policy-making infrastructure differs, a collaborative approach can be achieved by focusing on specific policy initiatives. Clearly, much can be learned by Illinois policymakers from models in Iowa and Missouri, among others. In addition, existing interstate compacts under Illinois law can create a baseline for long-term multi-state approaches to recovery.

Multistate strategies should include the following (at a minimum):

- Utilize existing interstate compacts as policy framework
- Participate in NFIP process
- Participate in multistate river and flooding programs
- Develop border strategy

### ***Federal Funding***

The Federal government is a key and critical component of each and every policy priority for long-term recovery. The Army Corps of Engineers must be consulted on flood mitigation processes. Additionally, the NFIP creates the backbone for financial assistance when flooding occurs. Because of the recent push for creating stimulus as set forth in the American Recovery and Reinvestment Act of 2009, federal funding streams are available to promote shovel-ready recovery projects. In addition, Illinois is uniquely positioned to impact Federal policy because of its powerful Congressional delegation and President Obama's relationship to the State. Of course, other federal agencies (including the Department of Commerce, and the Economic Development Administration who has funded this work), are key stakeholders to long-term recovery approaches.

In order to develop a systematic federal strategy, the Long Term Recovery Study Group recommends the following:

- Identify key federal agencies and stakeholders for potential funding streams as work on the Long Term Recovery Council and Long Term Recovery Agency come to fruition.
- Determine ways in which Illinois can take the lead in the national conversation on long-term recovery, including outreach to the National Governors Association (NGA), the National Emergency Management Association (NEMA), the National Conference of State Legislatures (NCSL) and others.
- Utilize existing relationships with EDA Region V and other federal agencies to provide stimulus for shovel-ready projects relating to long-term recovery, as well as future planning and implementation.
- Build awareness among the Illinois Congressional Delegation as to the importance of a Long Term Recovery Council and a Long Term Recovery Agency as necessary components of a statewide, systemic approach to disaster and emergency preparedness and recovery.

### ***Policy Recommendations***

- Support mitigation efforts to reduce the flood risk.
  - Buy out and relocate structures in high hazard areas
  - Reduce reliance on levees or other structural barriers to flooding
  - Enlarge natural habitat areas that serve to retain floodwaters
  - Elevate structures and/ or utilities and appliances
    - Residence: furnace, air conditioner, electrical hook-ups, washer & dryer
    - Public buildings: electrical hook ups, generators, public records, valuable collections
  - Flood proofing
  - Relocate or protect critical facilities (potable water, waste water treatment, fire & police stations, transportation routes) and vulnerable public sectors (hospitals, nursing homes)
- Communicate true risk and costs (levees will be overtopped when the design flood is exceeded; investment in levees may create a future obligation for maintenance and repair). Such investments are appropriate because they protect farming operations.
- In creating the comprehensive River Basin Plan, and other floodplain management initiatives, the appropriate governing entities should engage in public participation.

- Integrate economic development and hazard mitigation planning into a comprehensive plan.
- Develop a comprehensive River Basin Plan from a state and regional perspective. This should also be based on actuarially based information.
- Utilize floodplain management as a tool to minimize ongoing investments in the floodplain.
- Increase access to flood insurance, including areas protected by levees.
- Engage in assessment, mapping, and floodplain regulation to future conditions (maximum build out/ climate change) in urban and urbanizing areas.
- Support a unified approach. Interagency Levee Task Force (“Alternative for reducing vulnerabilities will be considered for all levees to be repaired under Corps Public Law 84-99 program, FEMA Public Assistance program and the Natural Resources Conservation Service to include non-structural actions such as permanent evacuation of flood-prone areas, installation of flood warning systems, and/or creation of natural and artificial flood water storage basins.” <http://www.usace.army.mil/emergency/pages/iltfintro.aspx> (Accessed May 4, 2009). See the Illinois Interagency Levee Work Group Policy White Paper for recommendations on needed policy and process change (United States Army Corps of Engineers, Illinois Interagency Levee Work Group, 2009 In Progress).
- Identify potential funding mechanisms and be ready to implement plans to reduce risks both before and after floods (e.g., PL84-99, FEMA Public Assistance 406, Emergency Watershed Protection Program, Wetland Reserve Program, Community Development Block Grants, NFIP Hazard Mitigation Grant Program)
- Provide technical assistance to communities to identify risk and use grants to reduce exposure.
- Encourage communities to incorporate mitigation plans in economic/ land use/ zoning plans.
- Consider non-structural alternatives when practicable.
- Reserve structural protection for areas with no other options and build to at least 0.2% protection level where lives are at risk.
- Do not invest in areas at high risk for flooding.
- Communicate flood risk, and options for reducing risk, in a meaningful manner to target groups. Those who choose to live in high risk areas or profit from

development of high risk areas should bear the burden of that risk and not pass it on to the tax payer or the next generation.

- Educate citizens. Citizens need to understand risk and exposure. Public assistance after a disaster does not make one whole again, and insurance does not cover interruption of work or business activity. Individuals should consider options for reducing consequences of flooding.

## **References**

Interagency Floodplain Management Review Committee. 1994. Sharing the challenge: Floodplain management into the 21<sup>st</sup> century. Report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force.

Public Law 84-99 Codified at 33 USC 701n Emergency Funds Control Act of 1955, as amended.

United States Army Corps of Engineers, Illinois Interagency Levee Work Group. 2009 (In progress). Policy white paper. Reducing flood risk in levied areas and drainage districts.

Newsletter [http://www.iwr.usace.army.mil/iltf/docs/ILTF\\_Newsletter\\_Feb\\_09.pdf](http://www.iwr.usace.army.mil/iltf/docs/ILTF_Newsletter_Feb_09.pdf)



## *Listing of Agencies with Potential Jurisdiction Over Long Term Recovery*

- **DPT OF AGRICULTURE**
- 20 ILCS 205/ Civil Administrative Code of Illinois. (Department of Agriculture Law)
- 20 ILCS 215/ Aquaculture Development Act.
- 20 ILCS 220/ Rural Rehabilitation Corporation Act.
- 20 ILCS 230/ Biotechnology Sector Development Act.
- 20 ILCS 235/ Illinois AgrAbility Act.
  
- **DPT OF COMMERCE AND ECONOMIC OPPORTUNITY**
- 20 ILCS 605/ Civil Administrative Code of Illinois. (Department of Commerce and Economic Opportunity Law)
- 20 ILCS 620/ Economic Development Area Tax Increment Allocation Act.
- 20 ILCS 625/ Illinois Economic Opportunity Act.
- 20 ILCS 630/ Illinois Emergency Employment Development Act.
- 20 ILCS 655/ Illinois Enterprise Zone Act.
- 20 ILCS 660/ Family Farm Assistance Act.
- 20 ILCS 661/ High Speed Internet Services and Information Technology Act.
- 20 ILCS 662/ Local Planning Technical Assistance Act.
- 20 ILCS 663/ New Markets Development Program Act.
- 20 ILCS 665/ Illinois Promotion Act.
- 20 ILCS 685/ Particle Accelerator Land Acquisition Act.
- 20 ILCS 687/ Renewable Energy, Energy Efficiency, and Coal Resources Development Law of 1997.
- 20 ILCS 688/ Illinois Resource Development and Energy Security Act.
- 20 ILCS 689/ Illinois Renewable Fuels Development Program Act.
- 20 ILCS 690/ Rural Diversification Act.
- 20 ILCS 692/ Small Business Advisory Act.
- 20 ILCS 695/ State and Regional Development Strategy Act.
- 20 ILCS 700/ Technology Advancement and Development Act.
- 20 ILCS 701/ High Technology School-to-Work Act.
- 20 ILCS 710/ Illinois Commission on Volunteerism and Community Service Act.
- 20 ILCS 715/ Corporate Accountability for Tax Expenditures Act.
  
- **DPT OF NATURAL RESOURCES**  
(formerly CONSERVATION)
- 20 ILCS 801/ Department of Natural Resources Act.
- 20 ILCS 805/ Civil Administrative Code of Illinois. (Department of Natural Resources (Conservation) Law)
- 20 ILCS 820/ Forestry Cooperative Agreement Act.

- 20 ILCS 825/ Forest Land Exchange Act.
- 20 ILCS 830/ Interagency Wetland Policy Act of 1989.
- 20 ILCS 835/ State Parks Act.
- 20 ILCS 840/ State Parks Designation Act.
- 20 ILCS 845/ State Park Audit Act.
- 20 ILCS 850/ Illinois and Michigan Canal State Park Act.
- 20 ILCS 855/ Wild or Scenic River Area Act.
- 20 ILCS 860/ Outdoor Recreation Resources Act.
- 20 ILCS 862/ Recreational Trails of Illinois Act.
- 20 ILCS 865/ Kaskaskia River Watershed Operation and Maintenance Act.
- 20 ILCS 870/ Rend Lake Dam and Reservoir Operation and Maintenance Act.
- 20 ILCS 875/ Firearms Training Act.
- 20 ILCS 880/ Illinois Conservation Foundation Act.

- **DPT OF HUMAN SERVICES**

- 20 ILCS 1305/ Department of Human Services Act

- **DPT OF NATURAL RESOURCES**

- 20 ILCS 1905/ Civil Administrative Code of Illinois. (Department of Natural Resources (Mines and Minerals) Law)
- 20 ILCS 1910/ Coal Products Commission Transfer Act.
- 20 ILCS 1915/ Surface Coal Mining Fee Act.
- 20 ILCS 1920/ Abandoned Mined Lands and Water Reclamation Act.

- **DPT OF STATE POLICE**

- 20 ILCS 2605/ Civil Administrative Code of Illinois. (Department of State Police Law)

- **EMERGENCY MANAGEMENT AGENCY**

- 20 ILCS 3305/ Illinois Emergency Management Agency Act.

- **ILLINOIS HOUSING DEVELOPMENT AUTHORITY**

- 20 ILCS 3805/ Illinois Housing Development Act.

**ILLINOIS INVESTMENT AND DEVELOPMENT AUTHORITY**

- 20 ILCS 3820/ Illinois Investment and Development Authority Act.

**ILLINOIS POWER AGENCY**

- 20 ILCS 3855/ Illinois Power Agency Act.

- **BOARDS AND COMMISSIONS**

- 20 ILCS 3901/ Addison Creek Restoration Commission Act.
- 20 ILCS 3905/ Alton Lake Heritage Parkway Corridor Law.
- 20 ILCS 3954/ Green Governments Illinois Act.
- 20 ILCS 3965/ Illinois Economic Development Board Act.

- 20 ILCS 3967/ Illinois River Watershed Restoration Act.
- 20 ILCS 3968/ Interagency Coordinating Committee on Transportation Act.
- 20 ILCS 3970/ Interagency Coordinating Council Act.
- 20 ILCS 3975/ Illinois Workforce Investment Board Act.
- 20 ILCS 4003/ Mississippi River Coordinating Council Act.
- 20 ILCS 4060/ Wabash and Ohio Rivers Coordinating Council Act.

## **INTERSTATE COMPACTS**

- 45 ILCS 30/ Quad Cities Interstate Metropolitan Authority Compact Act.
- 45 ILCS 35/ Quad Cities Interstate Metropolitan Authority Act.
- 45 ILCS 100/ Bi-State Development Compact Act.
- 45 ILCS 105/ Bi-State Development Agency Act.
- 45 ILCS 110/ Bi-State Development Powers Act.
- 45 ILCS 111/ Bi-State Transit Safety Act.
- 45 ILCS 135/ Wabash Valley Compact Act.
- 45 ILCS 145/ Great Lakes Basin Compact Act.
- 45 ILCS 147/ Great Lakes-St. Lawrence River Basin Water Resources Compact Act.
- 45 ILCS 151/ Emergency Management Assistance Compact Act.
- 45 ILCS 155/ Midwestern Higher Education Compact Act.

## **LOCAL GOVERNMENT**

### **GENERAL PROVISIONS**

- 50 ILCS 5/ Emergency Government Relocation Act.
- 50 ILCS 10/ Regional Council Act.
- 50 ILCS 15/ Regional Planning Commission Act.
- 50 ILCS 20/ Public Building Commission Act.
- **POLICE, FIRE, AND EMERGENCY SERVICES**
- 50 ILCS 705/ Illinois Police Training Act.
- 50 ILCS 740/ Illinois Fire Protection Training Act.
- 50 ILCS 750/ Emergency Telephone System Act.
- 50 ILCS 751/ Wireless Emergency Telephone Safety Act.
- 50 ILCS 752/ Illinois Public Safety Agency Network Act.
- 50 ILCS 755/ Water Rescue Act.

### **LOCAL REGULATION**

- 50 ILCS 805/ Local Land Resource Management Planning Act.
- 50 ILCS 815/ Flood Damage Prevention Act.

## COUNTIES

- 55 ILCS 5/ Counties Code.

Division 5-12 - Zoning

Division 5-13 - Building Or Setback Lines

Division 5-14 - Regional Planning

Division 5-15 - Water Supply, Drainage And Flood Control

- 55 ILCS 90/ County Economic Development Project Area Tax Increment Allocation Act of 1991.

## TOWNSHIPS

**(60 ILCS 1/) Township Code.**

Article 73 - Highway Commissioner

Article 185 - Facilities And Services For Developmentally Disabled Persons

Article 190 - Agreements For Mental Health Services For Township Residents

Article 195 - Township Ambulance Services

Article 200 - Township Emergency Vehicles And Equipment

Article 205 - Township Waterworks And Sewerage Systems

Article 207 - Township Special Service Areas

Article 230 - Employment And Training Programs

## MUNICIPALITIES

- 65 ILCS 5/ Illinois Municipal Code.

Art 11 prec Div 74.2 - Commercial Blight Areas

Division 74.2 - Commercial Renewal and Redevelopment Areas

Division 74.3 - Business District Development and Redevelopment

Division 74.4 - Tax Increment Allocation Redevelopment Act

Division 74.5 - Municipal Housing Finance Law

Division 74.6 - Industrial Jobs Recovery Law

Art 11 prec Div 74.2 - Commercial Blight Areas

Division 74.2 - Commercial Renewal and Redevelopment Areas

Division 74.3 - Business District Development and Redevelopment

Division 74.4 - Tax Increment Allocation Redevelopment Act

Division 74.5 - Municipal Housing Finance Law

Division 74.6 - Industrial Jobs Recovery Law

Art 11 prec Div 107 - Bridges, Viaducts, Tunnels, Ferries

Division 107 - Bridges, Viaducts and Tunnels

Division 108 - Ferries and Toll Bridges  
Art 11 prec Div 109 - Drains, Culverts, Cesspools, Sewers  
Division 109 - Regulation of Culverts, Drains Sewers and Cesspools  
Art 11 prec Div 110 - Flood Control and Drainage  
Division 110 - Drainage By Special Assessment  
Division 111 - Drainage Improvement Districts  
Division 111.1 - Removal of Stream Obstructions  
Division 112 - Taxes for Levee Purposes  
Division 113 - Surface Water and Sewage Removal Tax  
Division 113.1 - Stormwater Management Tax  
Division 114 - Levee Improvement Commission  
Division 114.1 - Flood Insurance Rate Maps  
Division 115 - State Aid in Flood Control  
Division 115.1 - Municipal - Federal Flood Control Projects

- 65 ILCS 105/ Shore Lands for Park Use Act.
- 65 ILCS 110/ Economic Development Project Area Tax Increment Allocation Act of 1995.
- 65 ILCS 115/ River Edge Redevelopment Zone Act.

## **SPECIAL DISTRICTS**

- **CONSERVATION**
- 70 ILCS 405/ Soil and Water Conservation Districts Act.
- 70 ILCS 410/ Conservation District Act.
  
- **DEVELOPMENT**
- 70 ILCS 525/ Tri-County River Valley Development Authority Law.
- 70 ILCS 530/ Upper Illinois River Valley Development Authority Act.
- 70 ILCS 532/ Western Illinois Economic Development Authority Act.
- **DRAINAGE**
- 70 ILCS 605/ Illinois Drainage Code.
- **PORT**
- 70 ILCS 1805/ Havana Regional Port District Act.
- 70 ILCS 1807/ Heart of Illinois Regional Port District Act.
- 70 ILCS 1810/ Illinois International Port District Act.
- 70 ILCS 1815/ Illinois Valley Regional Port District Act.
- 70 ILCS 1820/ Jackson-Union Counties Regional Port District Act.
- 70 ILCS 1825/ Joliet Regional Port District Act.
- 70 ILCS 1830/ Kaskaskia Regional Port District Act.
- 70 ILCS 1832/ Mid-America Intermodal Authority Port District Act.
- 70 ILCS 1835/ Mt. Carmel Regional Port District Act.
- 70 ILCS 1840/ Regional Port District Publicity Act.
- 70 ILCS 1845/ Seneca Regional Port District Act.
- 70 ILCS 1850/ Shawneetown Regional Port District Act.
- 70 ILCS 1855/ Southwest Regional Port District Act.

- 70 ILCS 1860/ Tri-City Regional Port District Act.
- 70 ILCS 1865/ Waukegan Port District Act.
- 70 ILCS 1870/ White County Port District Act.
- **RIVER CONSERVANCY**
- 70 ILCS 2105/ River Conservancy Districts Act.
- 70 ILCS 2110/ River Conservancy District Validation Act.
- 70 ILCS 2115/ Rend Lake Dam and Reservoir on the Big Muddy River Act.
- **SURFACE WATER PROTECTION**
- 70 ILCS 3405/ Surface Water Protection District Act.

## **WATERWAYS**

- 615 ILCS 5/ Rivers, Lakes, and Streams Act.
- 615 ILCS 10/ Illinois Waterway Act.
- 615 ILCS 15/ Flood Control Act of 1945.
- 615 ILCS 20/ Navigable Waters Obstruction Act.
- 615 ILCS 30/ Illinois and Michigan Canal Management Act.
- 615 ILCS 35/ Illinois and Michigan Canal Protection Act.
- 615 ILCS 40/ Illinois and Michigan Canal Land Use Act.
- 615 ILCS 45/ Illinois and Michigan Canal Development Act.
- 615 ILCS 50/ Level of Lake Michigan Act.
- 615 ILCS 55/ Lake Michigan Shore Line Act.
- 615 ILCS 60/ Des Plaines and Illinois Rivers Act.
- 615 ILCS 65/ Lake Calumet Harbor Act.
- 615 ILCS 75/ Kaskaskia River Watershed and Basin Act.
- 615 ILCS 80/ Big Kinkaid Creek Reservoir Act.
- 615 ILCS 85/ Blue Waters Ditch Flood Control Act.
- 615 ILCS 90/ Fox Waterway Agency Act.
- 615 ILCS 95/ Vermilion River Middle Fork Act.
- 615 ILCS 100/ McHenry County Dam Act.
- 615 ILCS 105/ Hennepin Canal Parkway State Park Act.
- 615 ILCS 110/ Kankakee River Dam Transfer Act.

# Appendix A

## WIU Reference Materials



Long Term Recovery Council  
**FINAL REPORT**

# PLAN OF WORK






To Administer the Long Term Recovery Council (LTRC)  
and complete its Final Report to the Governor

University of Illinois—Office of Sustainability

December 1, 2008



  <p>WESTERN ILLINOIS UNIVERSITY</p>	<p><b>Report on the LTRC Flood Study</b> Contributions from Western Illinois University Illinois Institute for Rural Affairs WIU GIS Center July 10, 2009</p>	 <p>WESTERN ILLINOIS UNIVERSITY <b>GIS CENTER</b> DEPARTMENT OF GEOGRAPHY <i>Assessing the Midwestern Corridor GIS Center</i> 303 &amp; 305 Tillman Hall (202) 279-1566 web: www.wiu.edu/giscenter email: giscenter@wiu.edu</p>
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## Introduction

The document reports on the role of Western Illinois University in the LTRC, including the role of the Illinois Institute for Rural Affairs and the WIU GIS Center. It then summarizes the information provided to the LTRC and constituent entities such as the Illinois Department of Commerce of Economic Opportunity (DCEO).

## Western Illinois University and the LTRC

During summer 2008, the Mississippi River and Wabash River experienced serious flooding that eventually affected more than two dozen counties in Illinois, along with counties in Iowa, Mississippi, and Indiana. In order to address the economic and human impacts of this flooding, the Office of the Illinois Governor contacted several universities, along with state and federal agencies to assess the damage and asked these entities to collaborate to study the impacts of the flooding and submit a report on the prospects for long term recovery in the region.

According to the Plan of Work for the Long Term Recovery Council (LTRC), “the Illinois Department of Commerce and Economic Opportunity’s (DCEO) Policy Development and Planning and Research Office contracted with the University of Illinois at Urbana-Champaign (UIUC) to carry out the goals and objectives of the Governor’s Long Term Recovery Council (LTRC). UIUC is responsible for overseeing the day-to-day management of the project, as well as completing all the tasks identified in both the Scope (and Plan) of Work.” While UIUC has primary responsibility for delivering on the work scope of the LTRC, the Illinois Institute for Rural Affairs (IIRA), a university-based research and outreach unit at Western Illinois University (WIU) was identified as a participant in the LTRC. Participants from the IIRA included Chris Merrett (Director of the IIRA), Brock Terry (GIS Specialist for the IIRA), Lori Sutton (IIRA DATA Center Program Manager), and Robin Hanna (IIRA Economic Development Outreach Specialist)



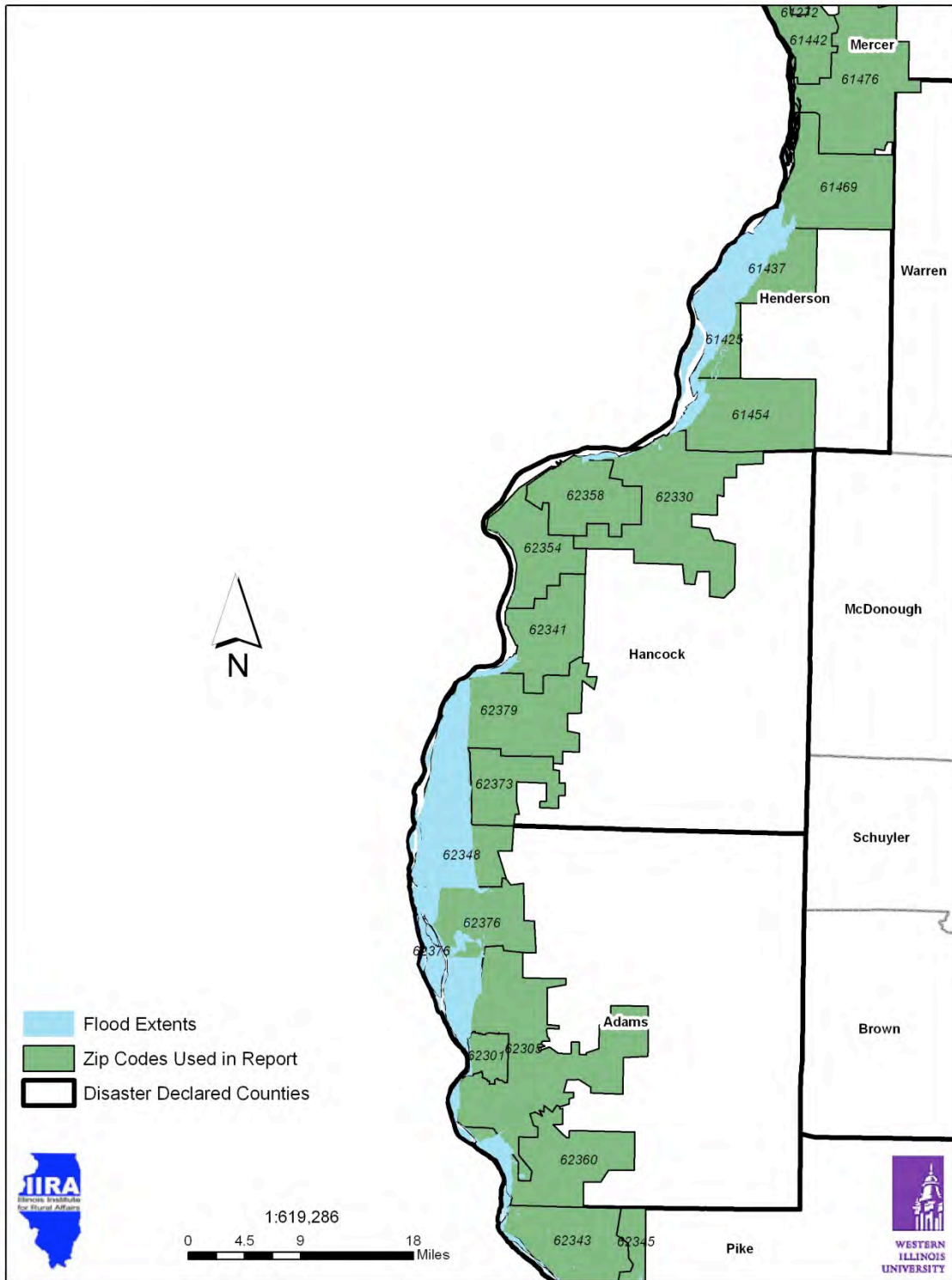
According to Chapter 4.1.4 of the Plan of Work, the LTRC will conduct a “*comprehensive economic impact analysis of the flood. Utilize county and sub-county data to support the analysis if needed. Incorporate the work of IIRA at WIU. Quantitative analysis and GIS mapping should be used to support analysis where feasible. Qualitative assessments of impacts, rooted in expert judgment and professional literature will be integrated.*”

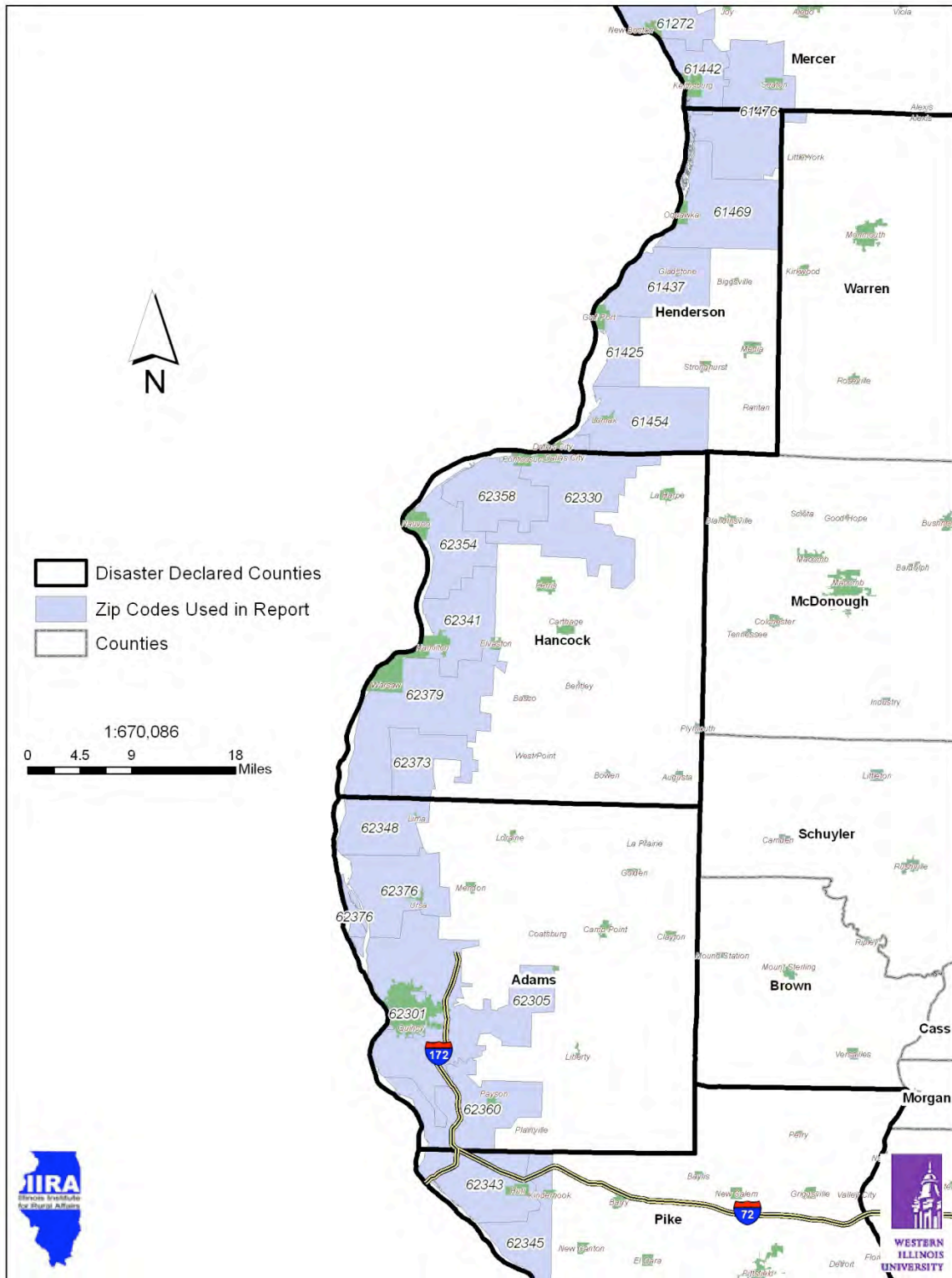
In order to accomplish its research, the IIRA partnered with the Western Illinois University GIS Center. The WIU GIS Center, which is housed in the WIU Department of Geography, is managed by Chad Sperry. The IIRA and the WIU GIS center shared equally in carrying out the WIU share of the LTRC research work scope.

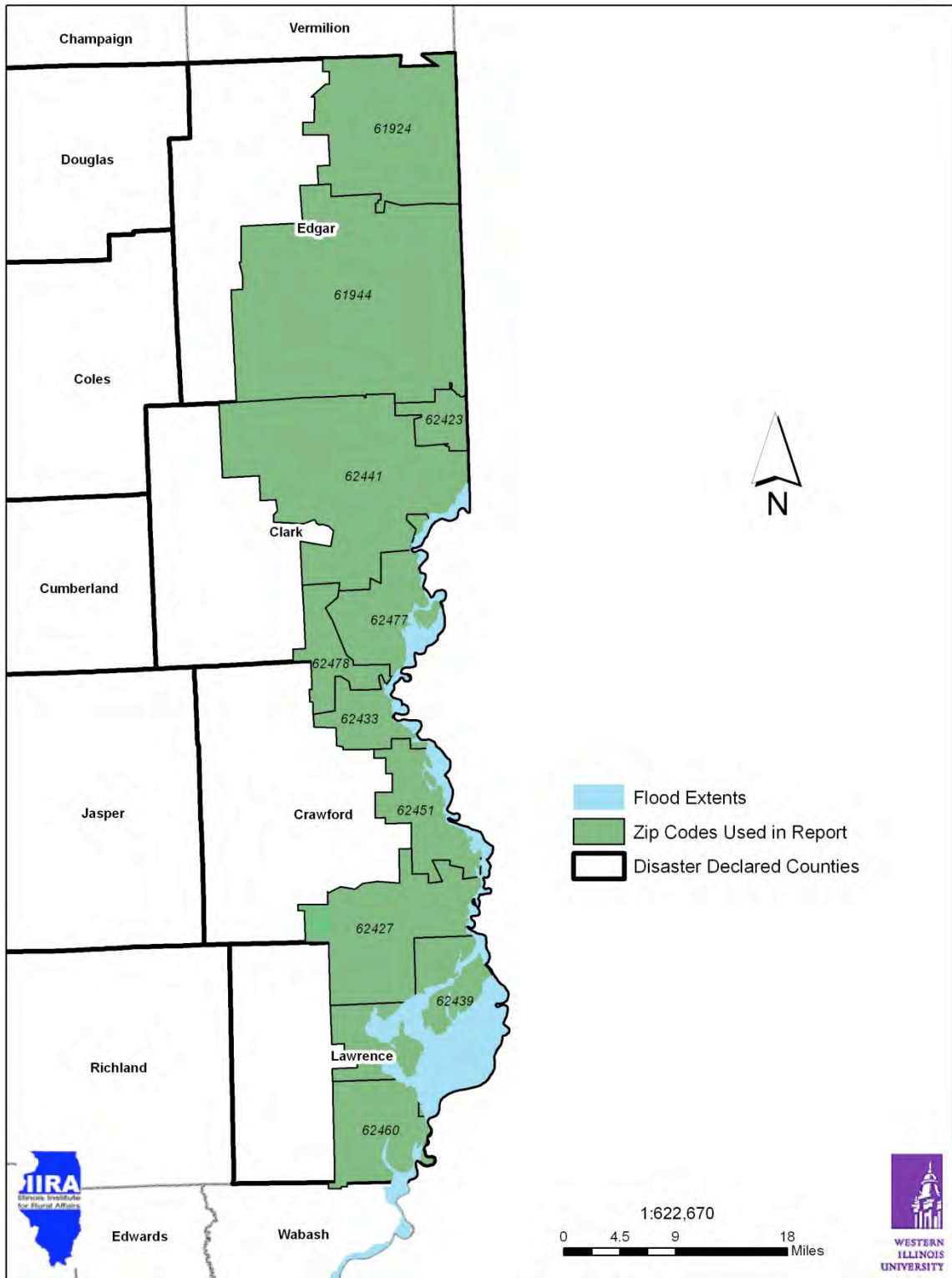
### **Inventory of WIU Contributions (IIRA and WIU GIS Center) to the LTRC Flood Study**

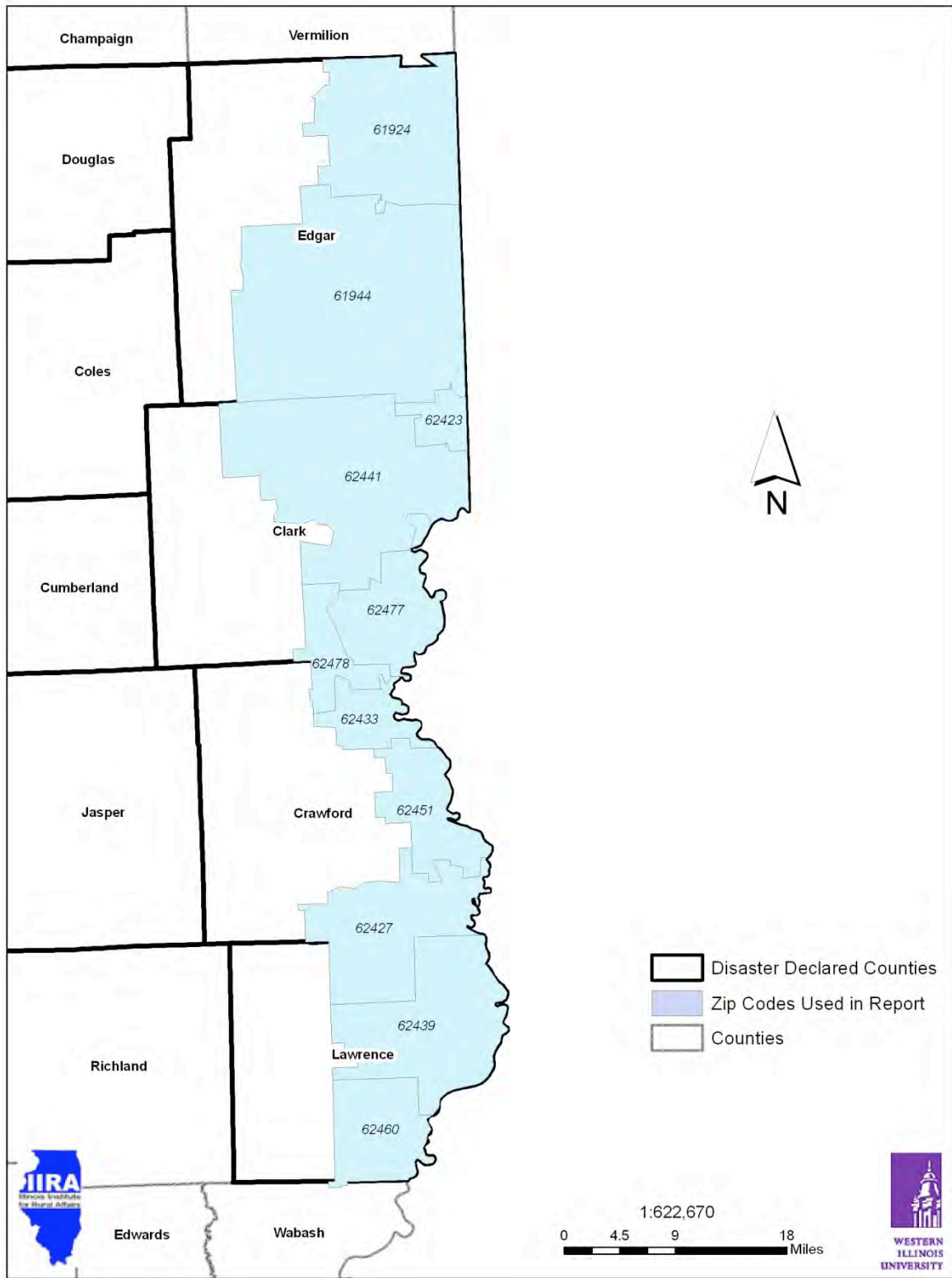
1. ***Presentation of Results to DCEO (10/10/08)***. IIRA and WIU GIS Center staff members traveled to Springfield, IL, and presented preliminary results to the Illinois Department of Commerce and Economic Opportunity (DCEO), Office for Policy Development and Planning and Research. The purpose of this presentation was to provide overview maps as well as detailed maps to guide further research.
2. ***Presentation of Results to EDA (11/20/08)***. IIRA and WIU GIS Center traveled to Burlington, IA to present results to the Western Illinois Regional Council (EDA RPC), Southeast Iowa Regional Planning Council (EDA RPC), Regional Director of the Economic Development Administration (Denver Office), and Regional Director of the Economic Development Administration (Chicago Office). The importance of this presentation is to compare how states on opposite sides of a flooded river (and in different EDA regions) addressed the flood damage assessment and recovery process. Despite the presence of Federal agencies which obviated many state differences, it was apparent that state-level responses differed in significant ways.
3. ***Zip Code Maps – Illinois Department of Revenue***. IIRA and WIU GIS Center generated maps depicting the zip codes affected by flooding along the Mississippi River and Wabash River. These maps (and associated data) were shared with UIUC REAL Laboratory and the Illinois Department of Revenue for the purpose of conducting research on the loss of sales tax revenues in flooded counties and zip codes. Data used to generate these maps came from ESRI and EMSI (Economic Modeling, Inc.)
  - a. Whiteside County to Mercer County (Mississippi River)
  - b. Henderson County to Pike County (Mississippi River)
  - c. Pike County to Jersey County (Mississippi River)
  - d. Madison County to Randolph County (Mississippi River)
  - e. Edgar County to Lawrence County (Wabash River)
  - f. Statewide Flood Zones by county and zip codes

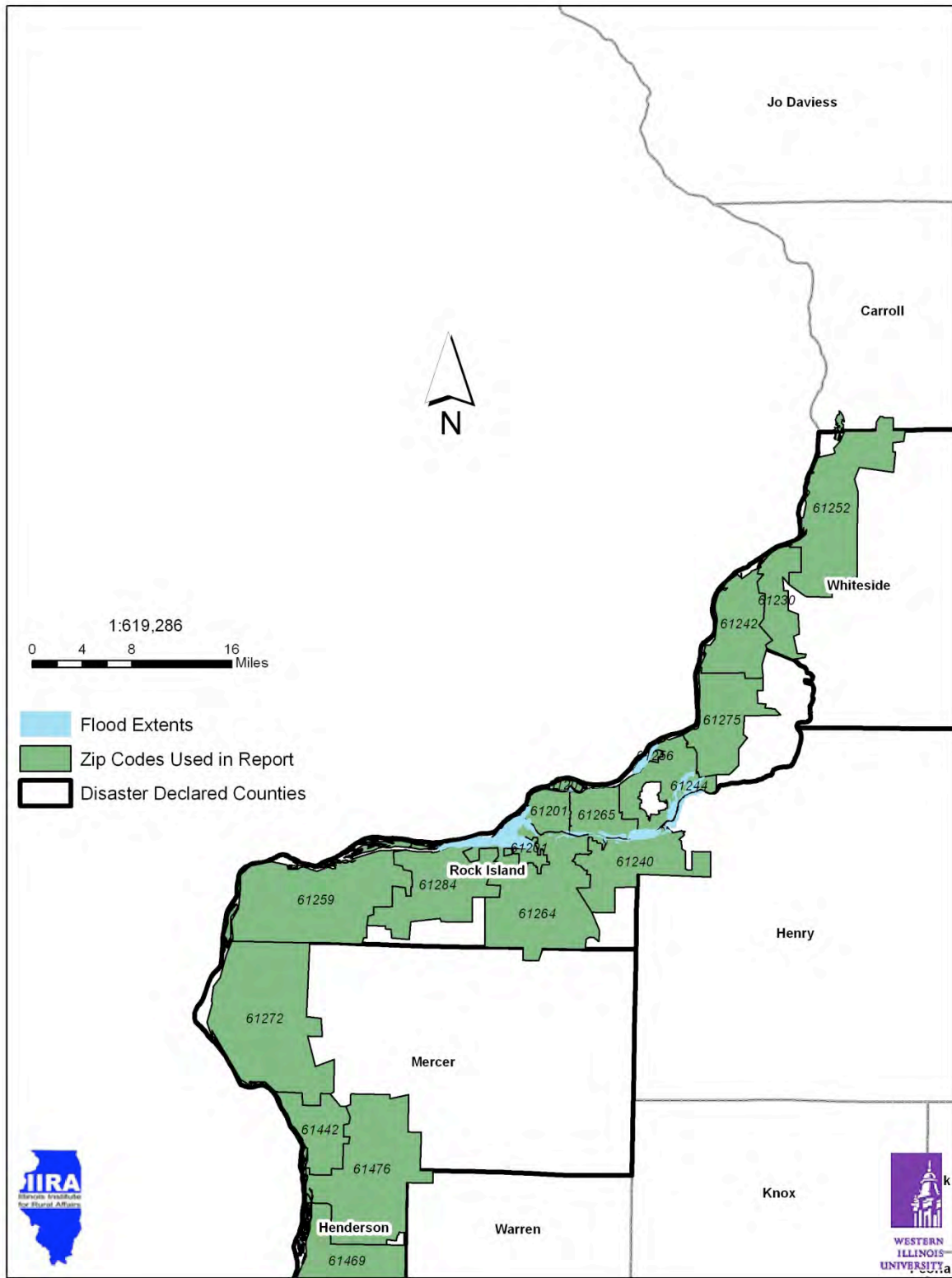
4. **Flood Extent Maps.** These maps were created by using satellite imagery for normal river levels. Satellite images taken during the high water mark were then placed over maps for normal water level to show areas of maximum flood extent. Data came from Dartmouth College, ESRI Business Analyst (Info USA), EMSI, FEMA, USDA, and the USACE.
  - a. Whiteside County to Mercer County (Mississippi River)
  - b. Henderson County to Pike County (Mississippi River)
  - c. Pike County to Jersey County (Mississippi River)
  - d. Madison County to Randolph County (Mississippi River)
  - e. Edgar County to Lawrence County (Wabash River)
  
5. **Pre-Flood Socioeconomic Benchmark Data.** These tables were created by using ESRI Business Analysis GIS software combined with EMSI socioeconomic data.
  - a. Earnings per worker, by County (by Zip Code is available)
  - b. Firms (number and NAICS Code), by County (by Zip Code is available)
  - c. Workers, by County (by Zip Code is available)
  
6. **Post-Flood Damage Assessment Maps.** These maps were created by using the flood extent maps described above and overlaying ESRI business analyst software to see which businesses were located in identified flood extents.
  - a. Businesses Affected by Flooding, by County and Zip Code – See PowerPoint presentation
  - b. Employees Affected by Flooding, by County and Zip Code – See PowerPoint presentation
  - c. Land Area Affected by Flooding – See PowerPoint Presentation
  
7. **Recommendations for further Study.**
  - a. Validation of Methodology for Flood Extent Identification
  - b. Survey of businesses in flooded zones. An estimated 326 businesses were identified to be located in flood zones. We propose a survey of affected business to seek input on:
    - i. Response by Federal Government Agencies
    - ii. Response by State Government Agencies
    - iii. Response by Local Government Agencies
    - iv. Recommendations for future disaster response
  - c. Impact of sales tax loss on local economies.
  - d. Impact of property tax losses on school district budgets.
  - e. Survey of County Engineers about damage to local infrastructure (e.g. roads, bridges, levees, sewer systems, water systems, and so forth).





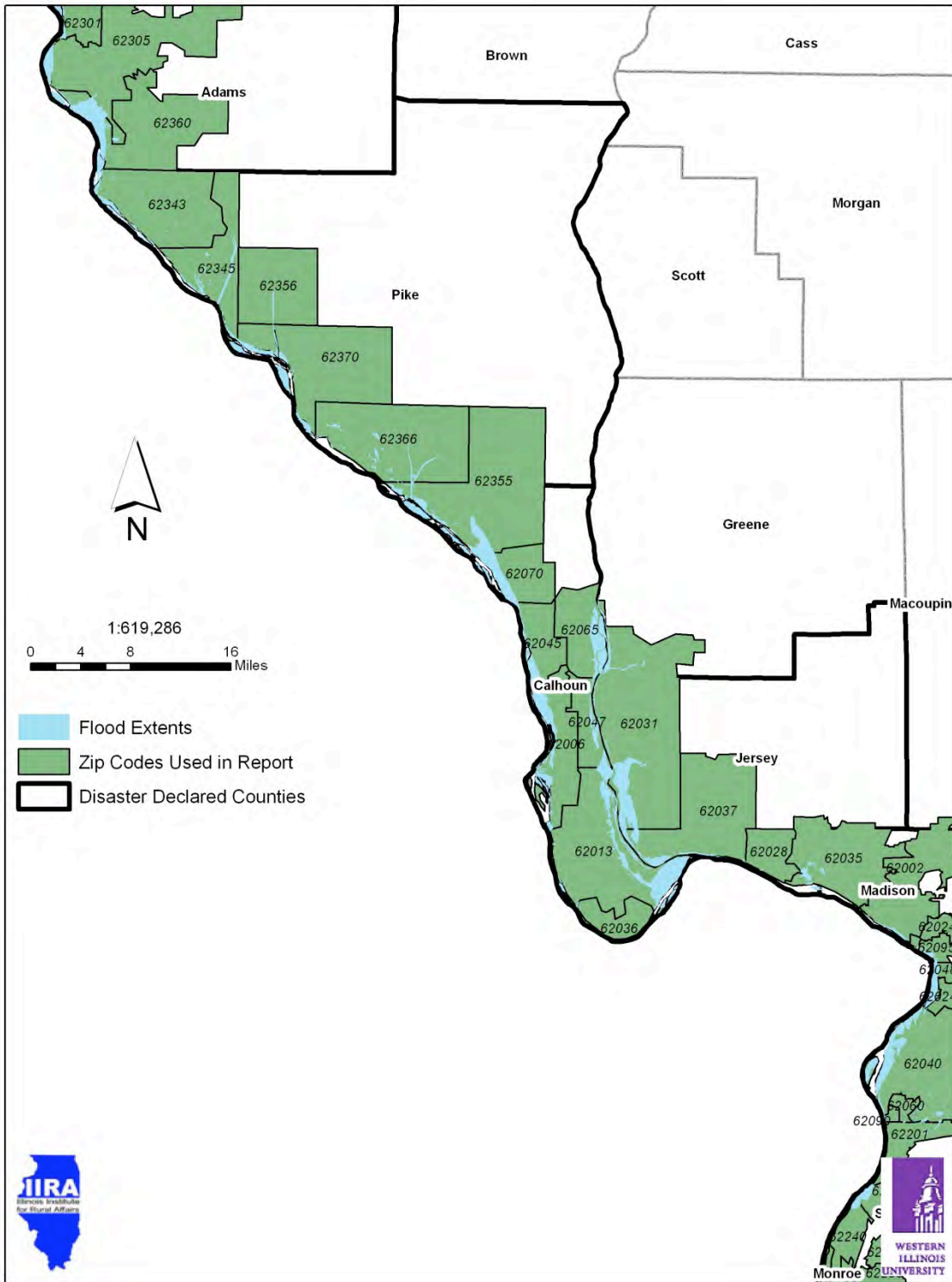


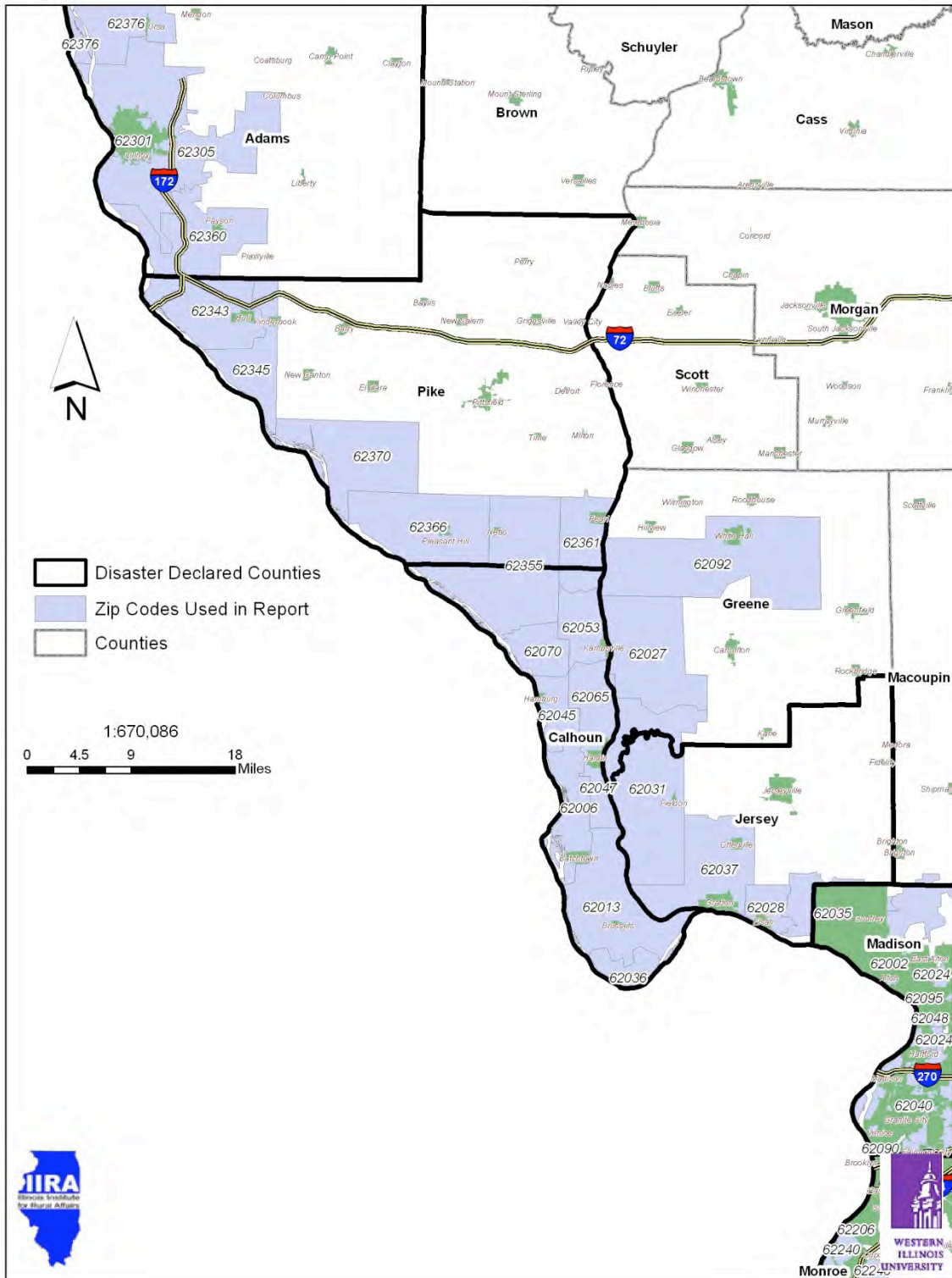


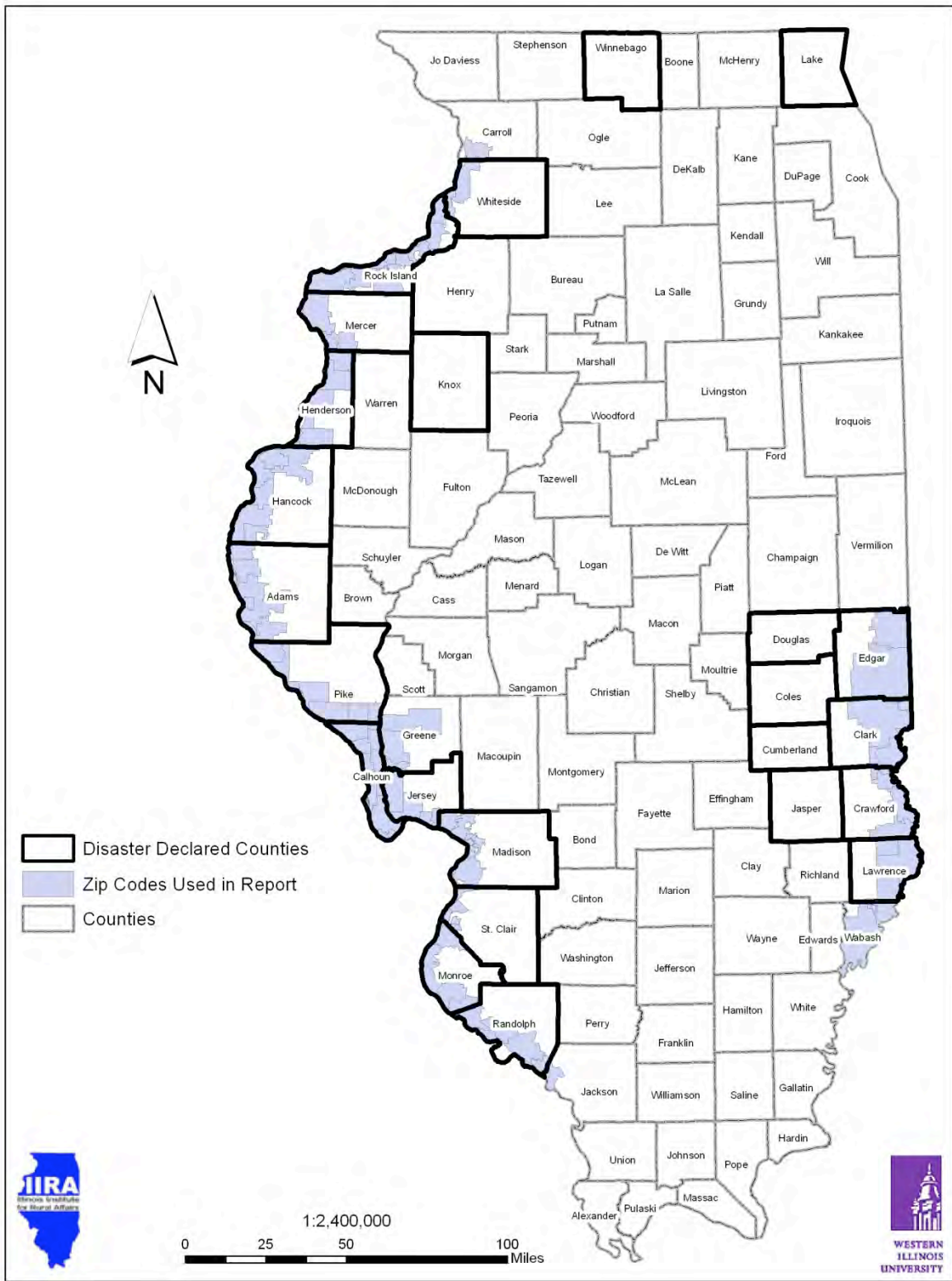


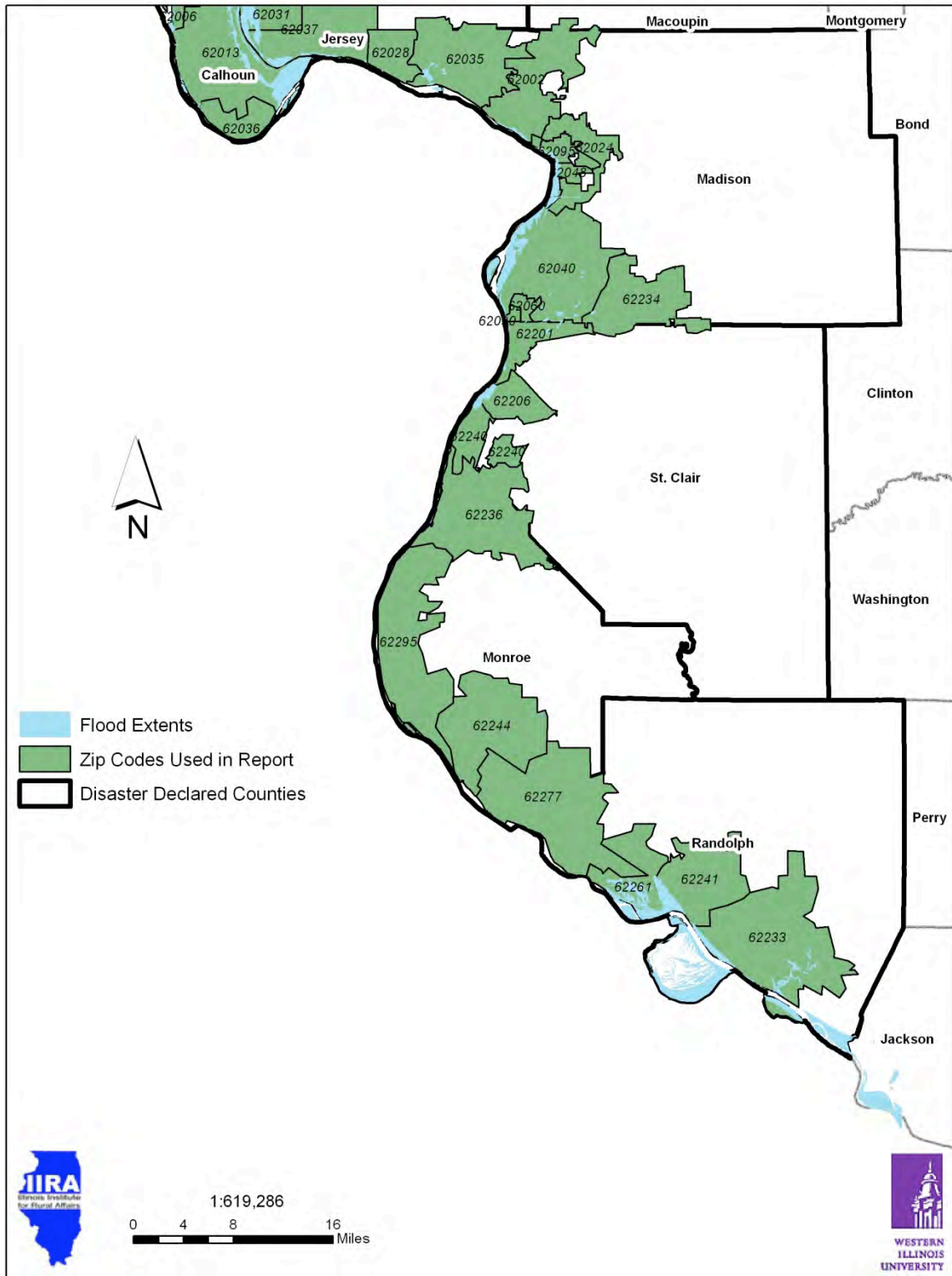


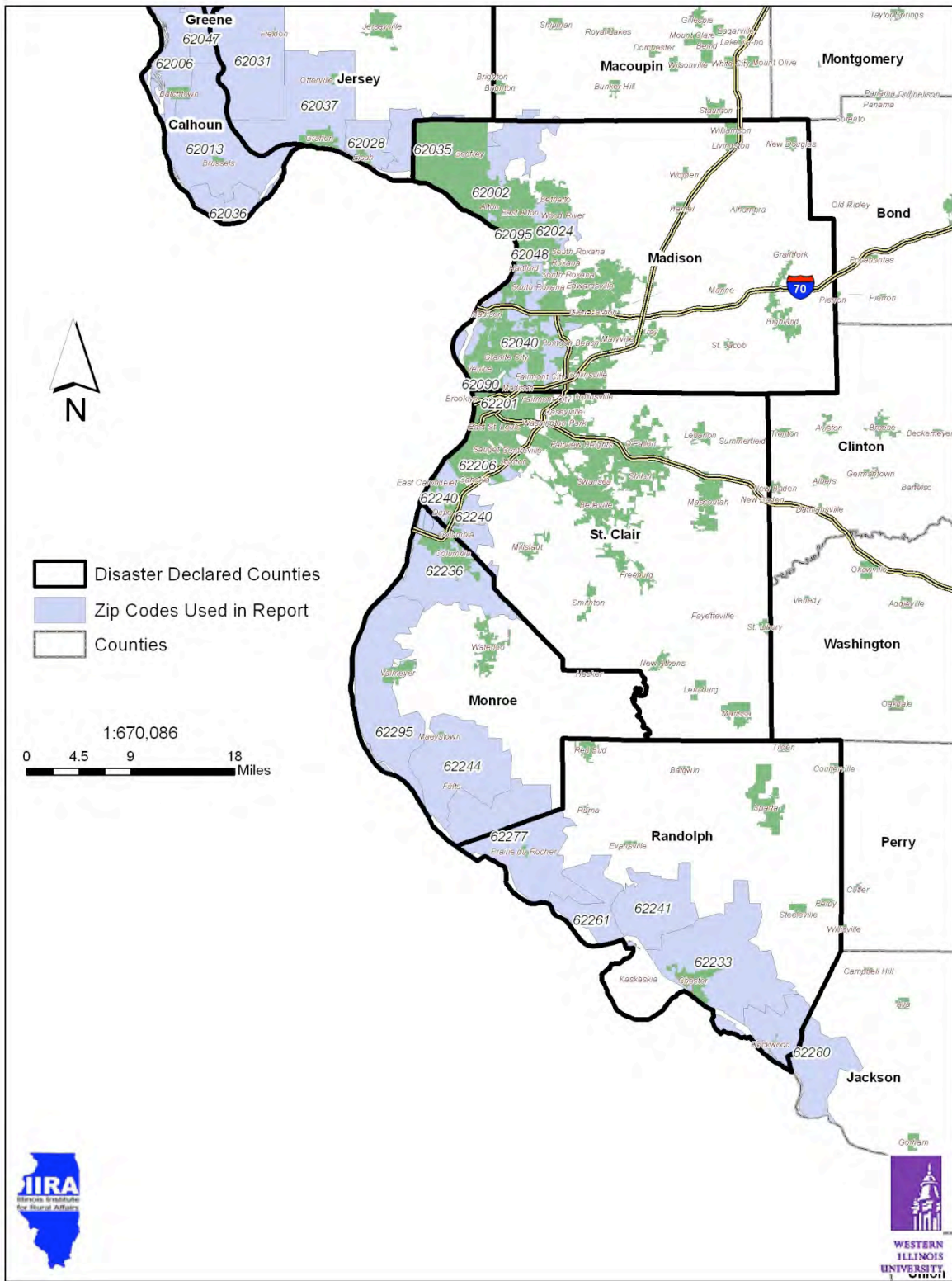












# GIS MAPPING OF FLOOD EXTENTS: MISSISSIPPI & WABASH RIVERS SUMMER 2008

(Revised 10/10/08)

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# Purpose

- ▣ Present some current research results on the impacts of 2008 flooding in Illinois
- ▣ Discuss strategies for further research
- ▣ Identify some of the data limitations
- ▣ Present the GIS Flood Assessment Tool
- ▣ Ask what other information might be valuable to DCEO and the Governor's Office

# Outline

- I. Overview of Flooded Areas
- II. Pre-Flood Benchmark Data
- III. Businesses Affected by Flooding
- IV. Data Limitations
- V. Conclusions – Next Steps
- VI. Data Sources



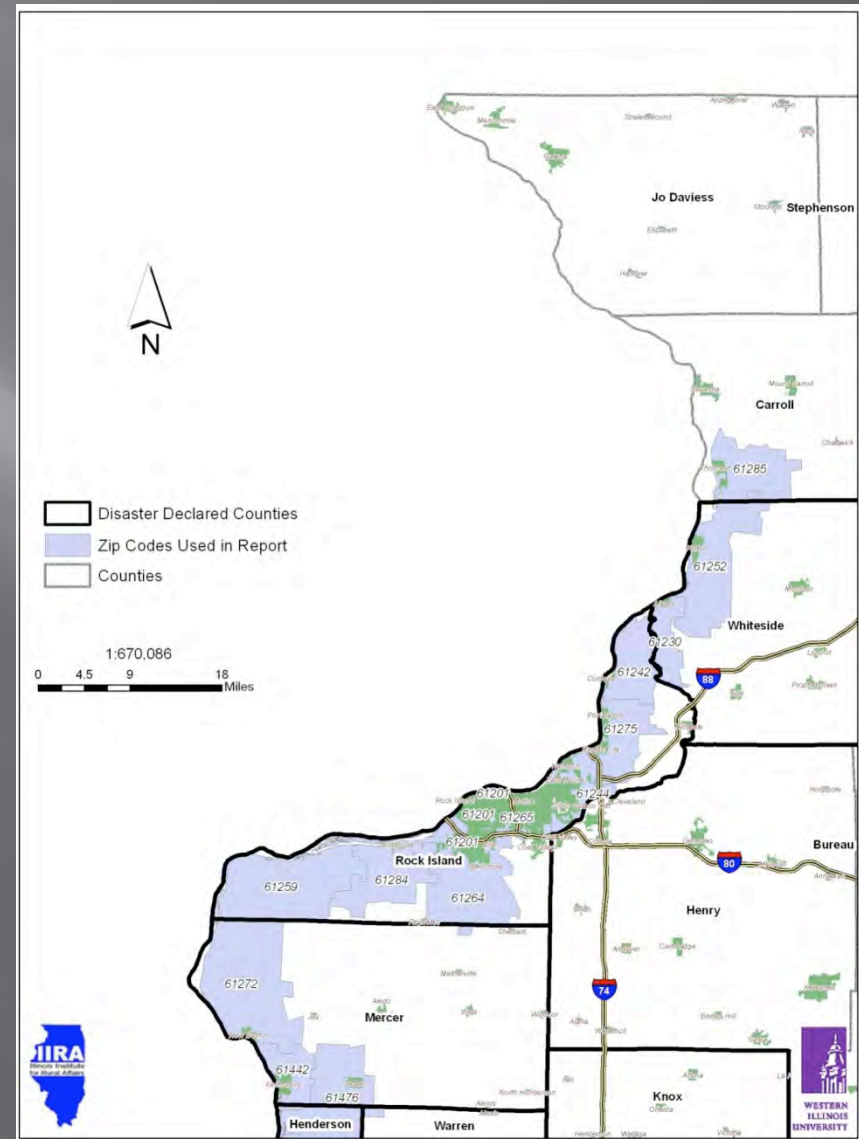
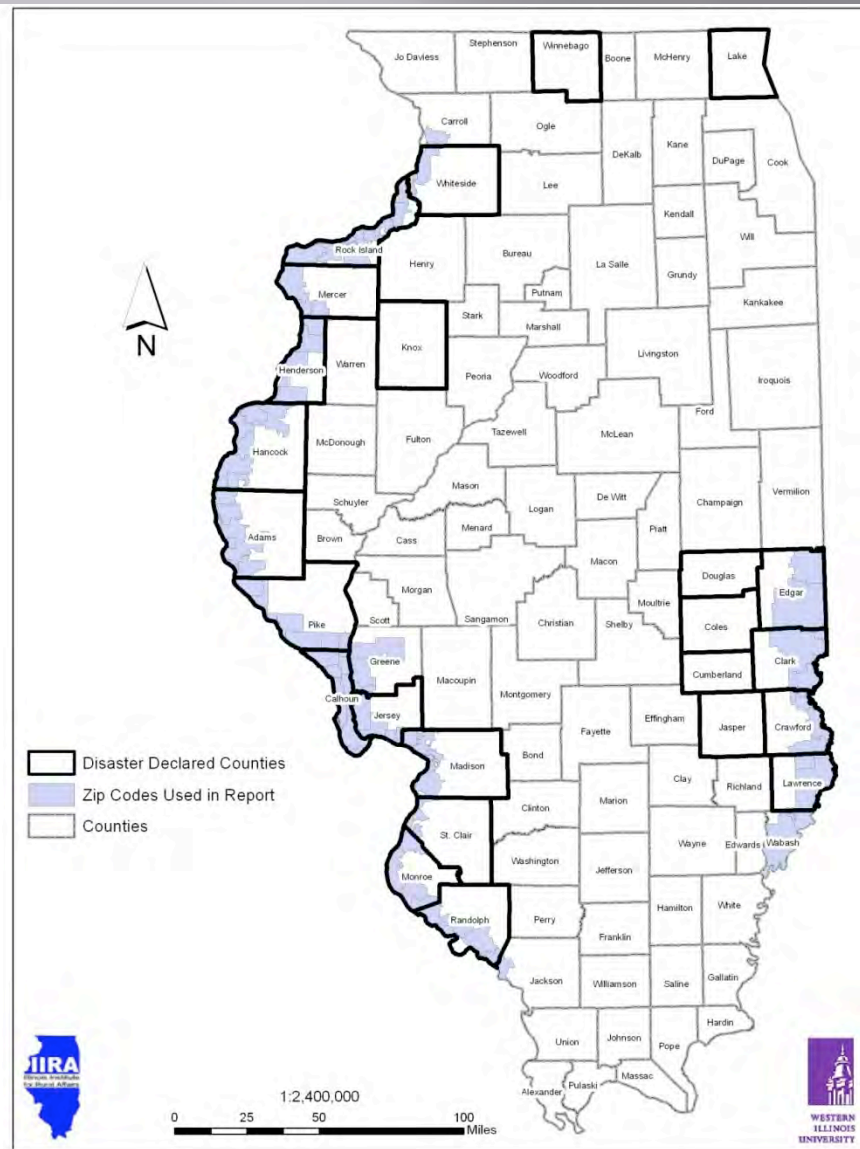
# I. Overview of Flooded Areas

**Table 1. Zip Codes affected by River Flooding**

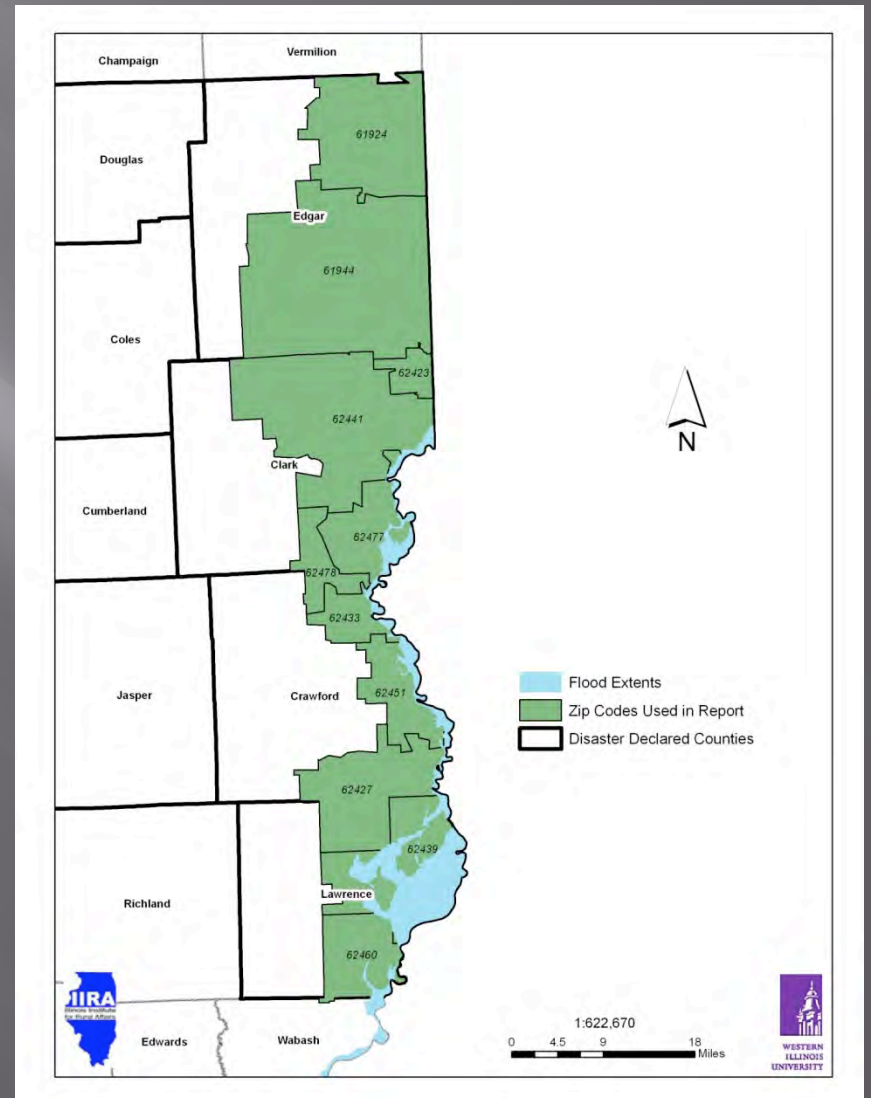
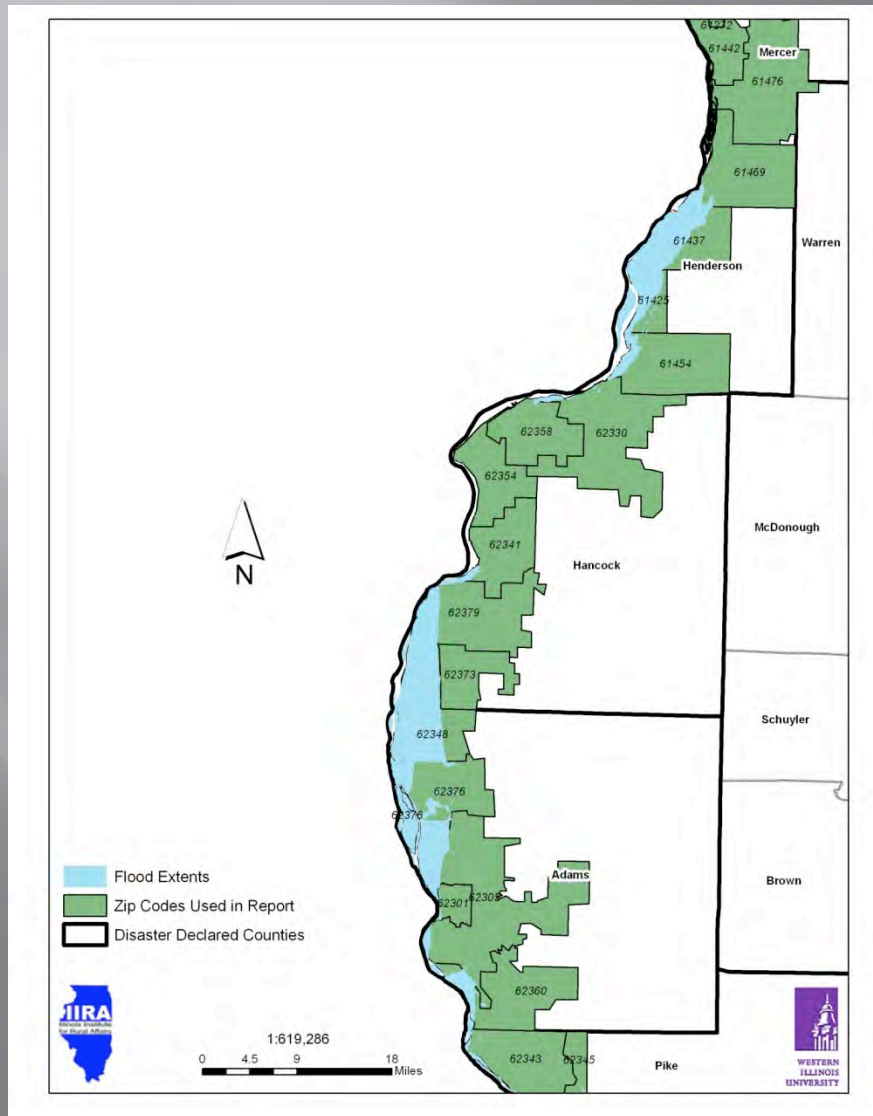
No.	ZIP CODE	PO BOX	No.	ZIP CODE	PO BOX	No.	ZIP CODE	PO BOX	No.	ZIP CODE	PO BOX
1.	61201	Rock Island	21.	62002	Alton	41.	62201	East Saint Louis	61.	62358	Niota
2.	61230	Albany	22.	62006	Batchtown	42.	62206	East Saint Louis	62.	62360	Payson
3.	61242	Cordova	23.	62013	Brussels	43.	62233	Chester	63.	62361	Pearl
4.	61244	East Moline	24.	62024	East Alton	44.	62236	Columbia	64.	62366	Pleasant Hill
5.	61252	Fulton	25.	62027	Eldred	45.	62240	East Carondelet	65.	62370	Rockport
6.	61259	Illinois City	26.	62028	Elsah	46.	62241	Ellis Grove	66.	62373	Sutter
7.	61264	Milan	27.	62031	Fieldon	47.	62244	Fults	67.	62376	Ursa
8.	61265	Moline	28.	62035	Godfrey	48.	62261	Modoc	68.	62379	Warsaw
9.	61272	New Boston	29.	62036	Golden Eagle	49.	62277	Prairie du Rocher	69.	62410	Allendale
10.	61275	Port Byron	30.	62037	Grafton	50.	62280	Rockwood	70.	62423	Dennison
11.	61284	Taylor Ridge	31.	62040	Granite City	51.	62295	Valmeyer	71.	62427	Flat Rock
12.	61285	Thomson	32.	62045	Hamburg	52.	62301	Quincy	72.	62433	Hutsonville
13.	61425	Carman	33.	62047	Hardin	53.	62305	Quincy	73.	62439	Lawrenceville
14.	61437	Gladstone	34.	62048	Hartford	54.	62330	Dallas City	74.	62441	Marshall
15.	61442	Keithsburg	35.	62053	Kampsville	55.	62341	Hamilton	75.	62451	Palestine
16.	61454	Lomax	36.	62065	Michael	56.	62343	Hull	76.	62460	Saint Francisville
17.	61469	Oquawka	37.	62070	Mozier	57.	62345	Kinderhook	77.	62477	West Union
18.	61476	Seaton	38.	62090	Venice	58.	62348	Lima	78.	62478	West York
19.	61924	Chrisman	39.	62092	White Hall	59.	62354	Nauvoo	79.	62863	Mount Carmel
20.	61944	Paris	40.	62095	Wood River	60.	62355	Nebo			

# I. Overview of Flooded Areas

## Examples of Maps showing Flooded Zip Codes



# Examples of Flood Extent Maps

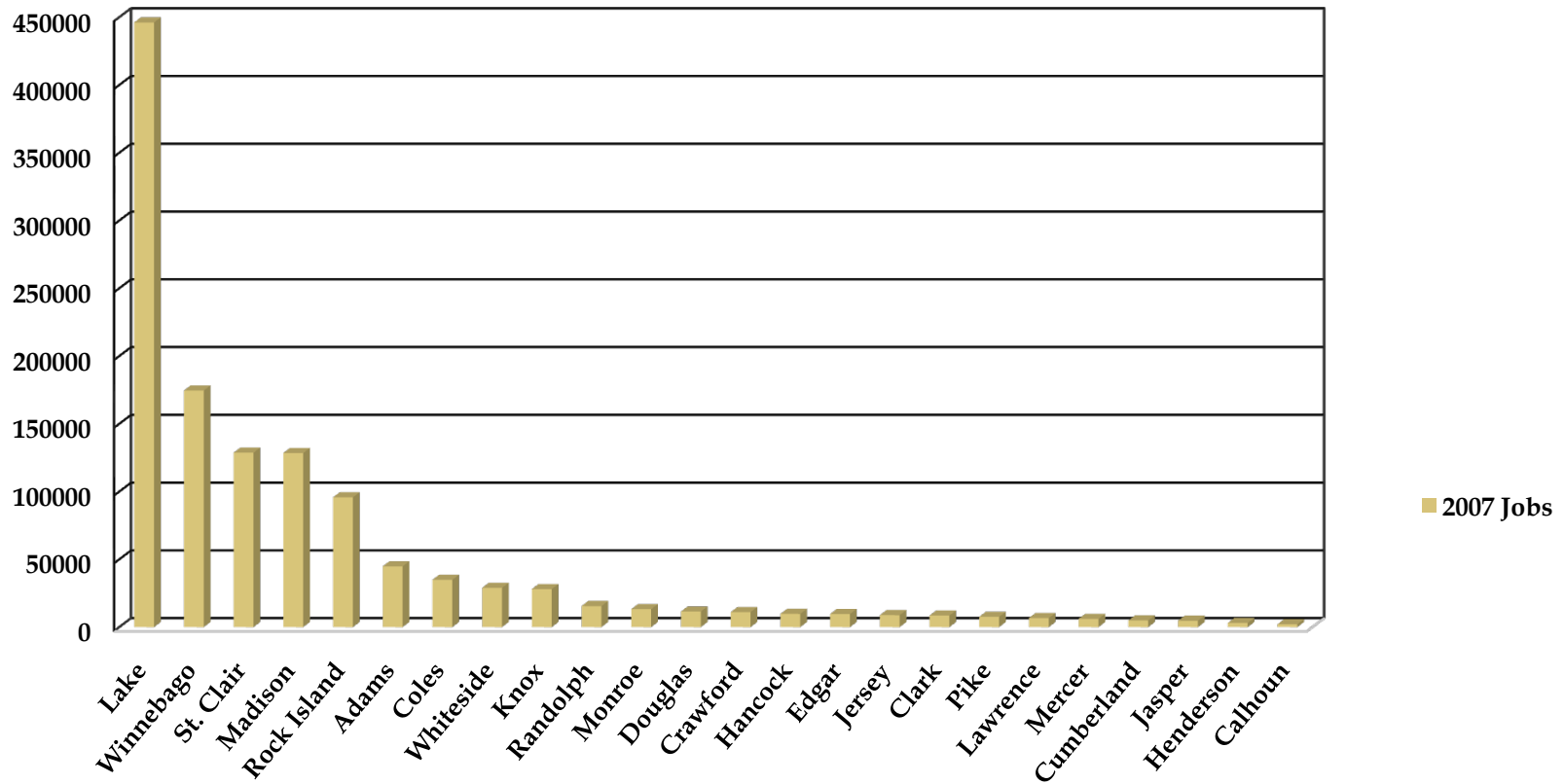


## II. Pre-Flood Benchmark Data

### Number of Jobs and Earnings per Worker Average in Flood Affected Counties

COUNTY	2007 Jobs	2008 Jobs	Change	% Change	EPW Average
Lake	446140	456976	10836	2%	<b>\$62,591</b>
Winnebago	174538	176959	2421	1%	\$41,852
St. Clair	128658	129861	1202	1%	\$42,299
Madison	128434	130130	1696	1%	\$39,710
Rock Island	95761	96975	1214	1%	\$50,666
Adams	44838	45536	698	2%	\$35,298
Coles	34880	35582	701	2%	\$32,524
Whiteside	28950	29232	281	1%	\$33,300
Knox	28044	28328	283	1%	\$31,749
Randolph	15517	15648	131	1%	\$33,582
Monroe	13209	13887	678	5%	\$29,431
Douglas	11492	11760	268	2%	\$30,837
Crawford	11020	11155	135	1%	\$39,834
Hancock	9735	10043	308	3%	\$24,219
Edgar	9646	9965	319	3%	\$30,728
Jersey	8789	9065	276	3%	\$24,852
Clark	8495	8807	313	4%	\$27,047
Pike	7576	7747	170	2%	\$24,002
Lawrence	6698	6895	197	3%	\$31,849
Mercer	6053	6288	235	4%	\$23,191
Cumberland	4875	5103	228	5%	\$22,540
Jasper	4683	4783	101	2%	\$28,391
Henderson	2994	3126	132	4%	\$23,404
Calhoun	2053	2153	99	5%	<b>\$18,772</b>
<b>TOTALS</b>	<b>1233078</b>	<b>1256004</b>			

## II. Pre-Flood Benchmark Data



## II. Pre-Flood Benchmark Data

### Industry Sectors and Jobs in Hancock County (sorted by NAICS code)

NAICS Code	Description	2008 Jobs	Change	% Change	EPW
11	Agriculture, forestry, fishing and hunting	1,479	(24)	(2%)	\$9,377
21	Mining	18	2	13%	\$55,561
22	Utilities	36	1	3%	\$67,384
23	Construction	632	27	4%	\$33,042
31-33	Manufacturing	1,181	109	10%	\$40,967
42	Wholesale trade	237	(16)	(6%)	\$33,023
44-45	Retail trade	1,171	30	3%	\$21,190
48-49	Transportation and warehousing	440	8	2%	\$41,567
51	Information	88	4	5%	\$23,788
52	Finance and insurance	466	15	3%	\$21,980
53	Real estate and rental and leasing	277	24	9%	\$17,909
54	Professional and technical services	365	18	5%	\$29,657
56	Administrative and waste services	274	17	7%	\$7,552
61	Educational services	57	5	10%	\$6,861
62	Health care and social assistance	788	8	1%	\$21,804
71	Arts, entertainment, and recreation	145	8	6%	\$12,670
72	Accommodation and food services	455	10	2%	\$11,608
81	Other services, except public administration	619	31	5%	\$14,578
90	Government	1,313	30	2%	\$33,129
		<b>10,043</b>	<b>308</b>	<b>3%</b>	<b>\$24,219</b>

Source: EMSI Complete Employment - Spring 2008 Release v. 2

## II. Pre-Flood Benchmark Data

### Industry Sectors and Jobs in Hancock County (sorted by Earnings per Worker--EPW)

NAICS Code	Description	2008 Jobs	Change	% Change	EPW
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		<b>10,043</b>	<b>308</b>	<b>3%</b>	<b>\$24,219</b>

Source: EMSI Complete Employment - Spring 2008 Release v. 2

## II. Pre-Flood Benchmark Data

### ZIP Codes: 62354 (in Hancock county, IL)

SOC Code	Description	2008 Jobs	2007 Avg Earnings/hr	State 2007	2007 State Avg Earnings/hr
11-0000	Management occupations	127	<b>\$18.21</b>	521,733	\$42.93
13-0000	Business and financial operations occupations	47	\$13.58	427,606	\$31.00
15-0000	Computer and mathematical science occupations	<10 --		161,987 --	
17-0000	Architecture and engineering occupations	18	\$20.83	94,644	\$33.72
19-0000	Life, physical, and social science occupations	<10 --		64,986 --	
21-0000	Community and social services occupations	<10 --		92,826 --	
23-0000	Legal occupations	<10 --		66,826 --	
25-0000	Education, training, and library occupations	28	\$16.86	422,578	\$28.84
27-0000	Arts, design, entertainment, sports, and media occupations	29	\$9.61	186,374	\$20.99
29-0000	Healthcare practitioners and technical occupations	<10 --		334,655 --	
31-0000	Healthcare support occupations	<10 --		156,332 --	
33-0000	Protective service occupations	<10 --		145,292 --	
35-0000	Food preparation and serving related occupations	104	\$7.92	470,731	\$9.32
37-0000	Building and grounds cleaning and maintenance occupations	121	\$7.89	296,811	\$11.03
39-0000	Personal care and service occupations	47	\$9.84	254,573	\$11.37
41-0000	Sales and related occupations	<b>239</b>	\$10.80	985,539	\$21.94
43-0000	Office and administrative support occupations	105	\$10.28	1,116,309	\$16.54
45-0000	Farming, fishing, and forestry occupations	<10 --		9,751 --	
47-0000	Construction and extraction occupations	148	\$17.71	351,483	\$26.85
49-0000	Installation, maintenance, and repair occupations	26	\$15.22	246,449	\$21.88
51-0000	Production occupations	101	\$12.53	558,975	\$16.87
53-0000	Transportation and material moving occupations	34	\$13.70	539,066	\$17.83
55-0000	Military Occupations	<10 --		47,356 --	
		<b>1,224</b>	<b>\$12.62</b>	<b>7,552,883</b>	<b>\$22.45</b>

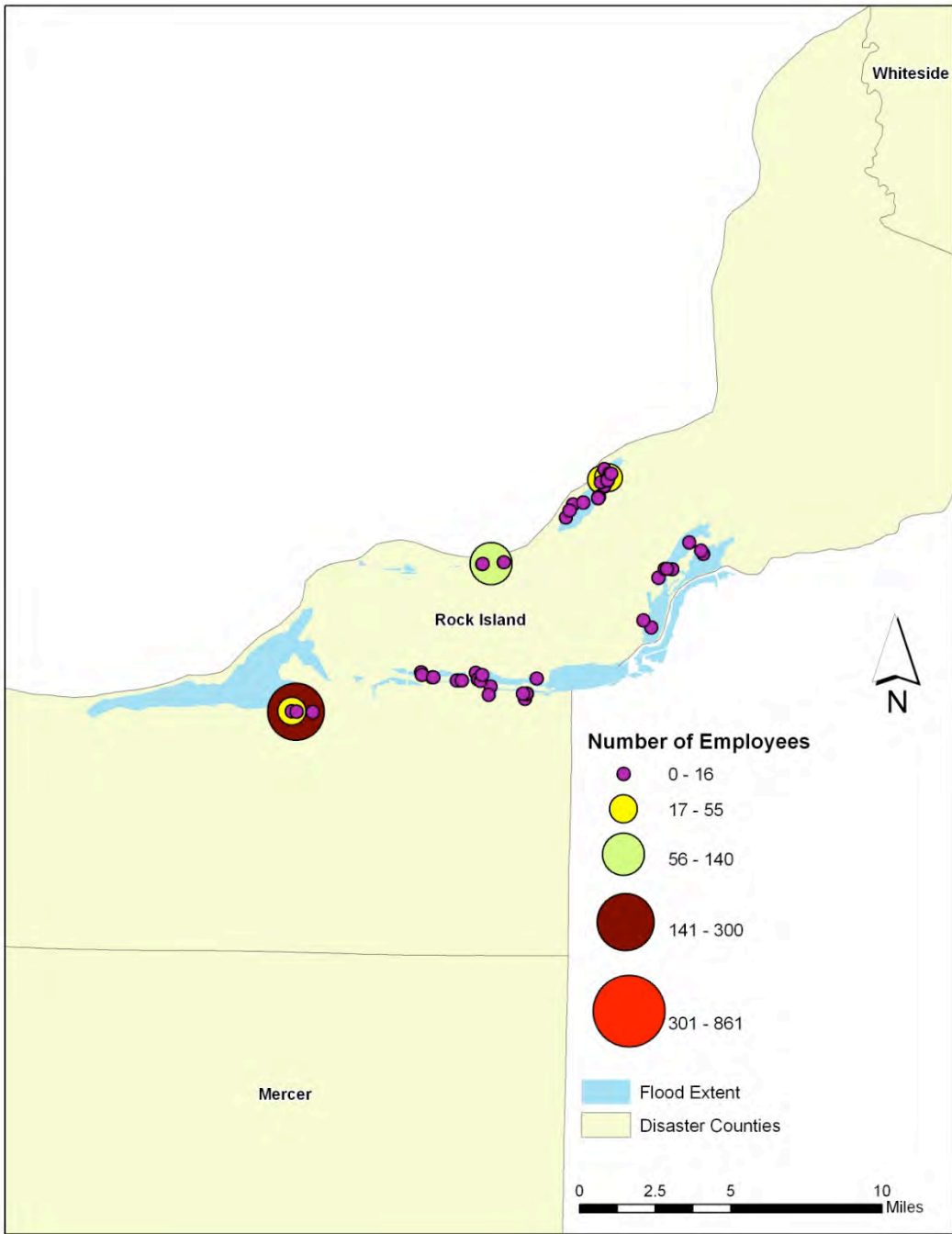
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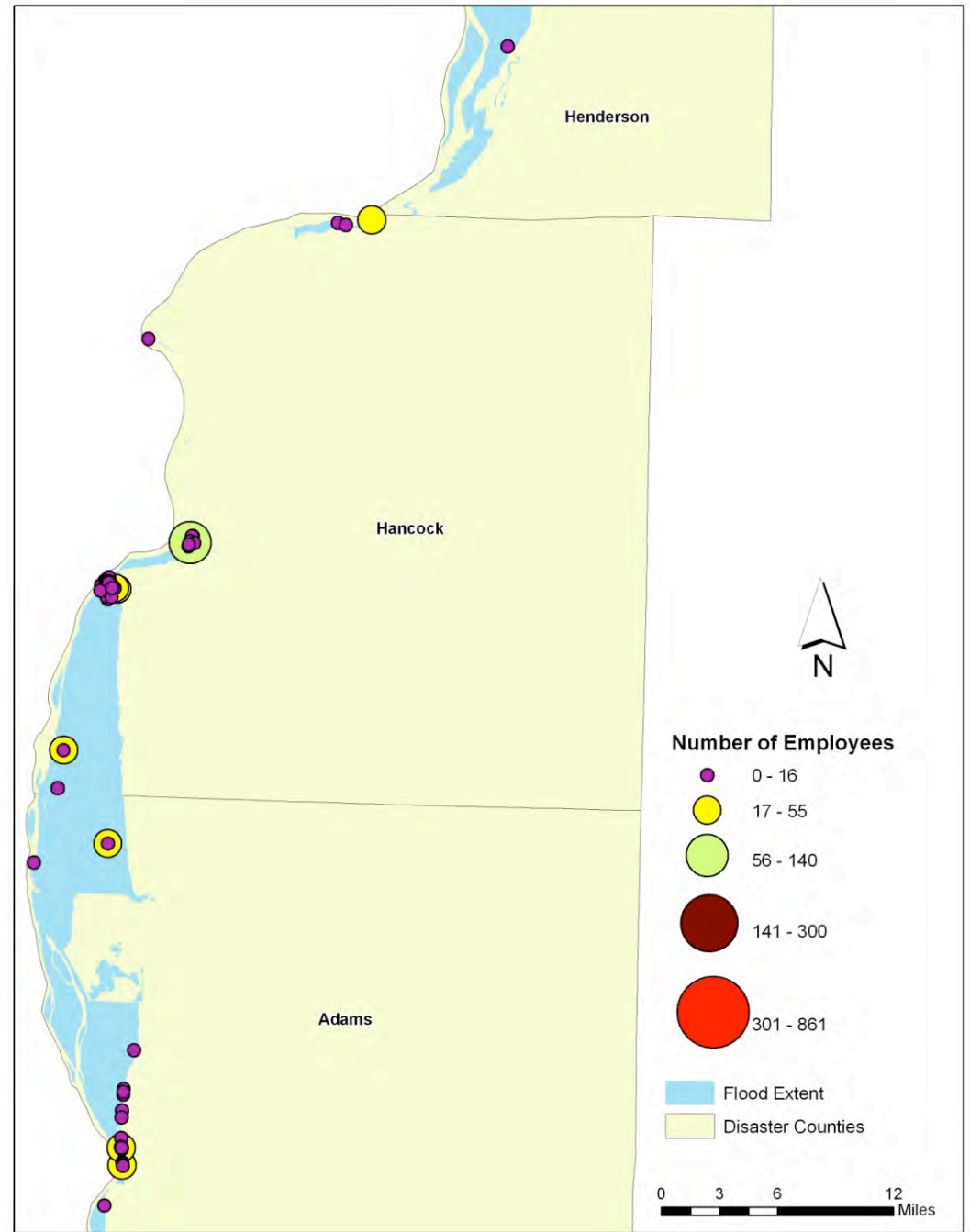
# III. Businesses Affected by Flooding

- ▣ Businesses affected along the Mississippi
  - Businesses within Inundation Zone
    - ▣ 310
  - Businesses Count - Sales volume
    - ▣ 702,396,000
  - Businesses Count - Number of Employees
    - ▣ 2,984

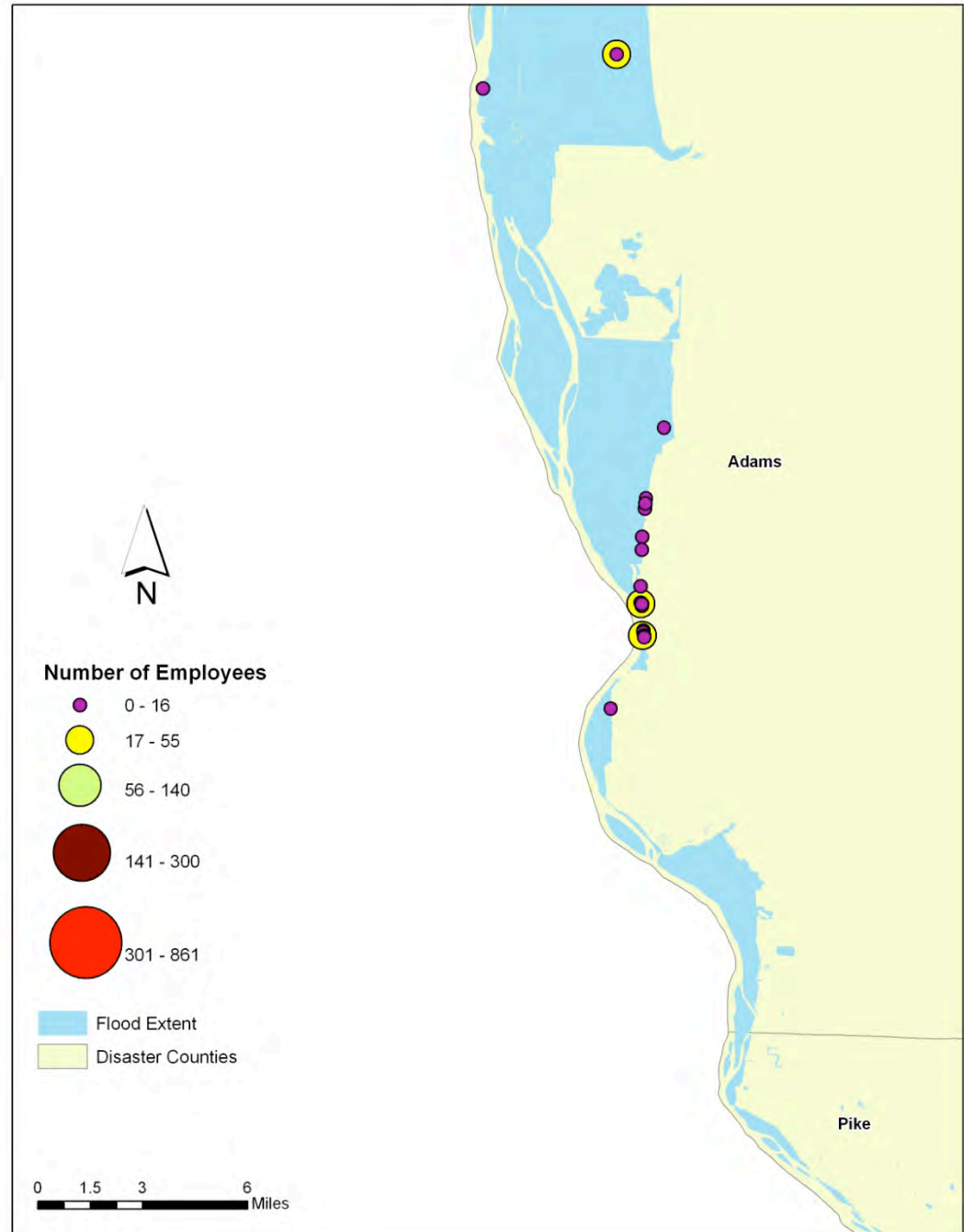
# III. Businesses Affected by Flooding



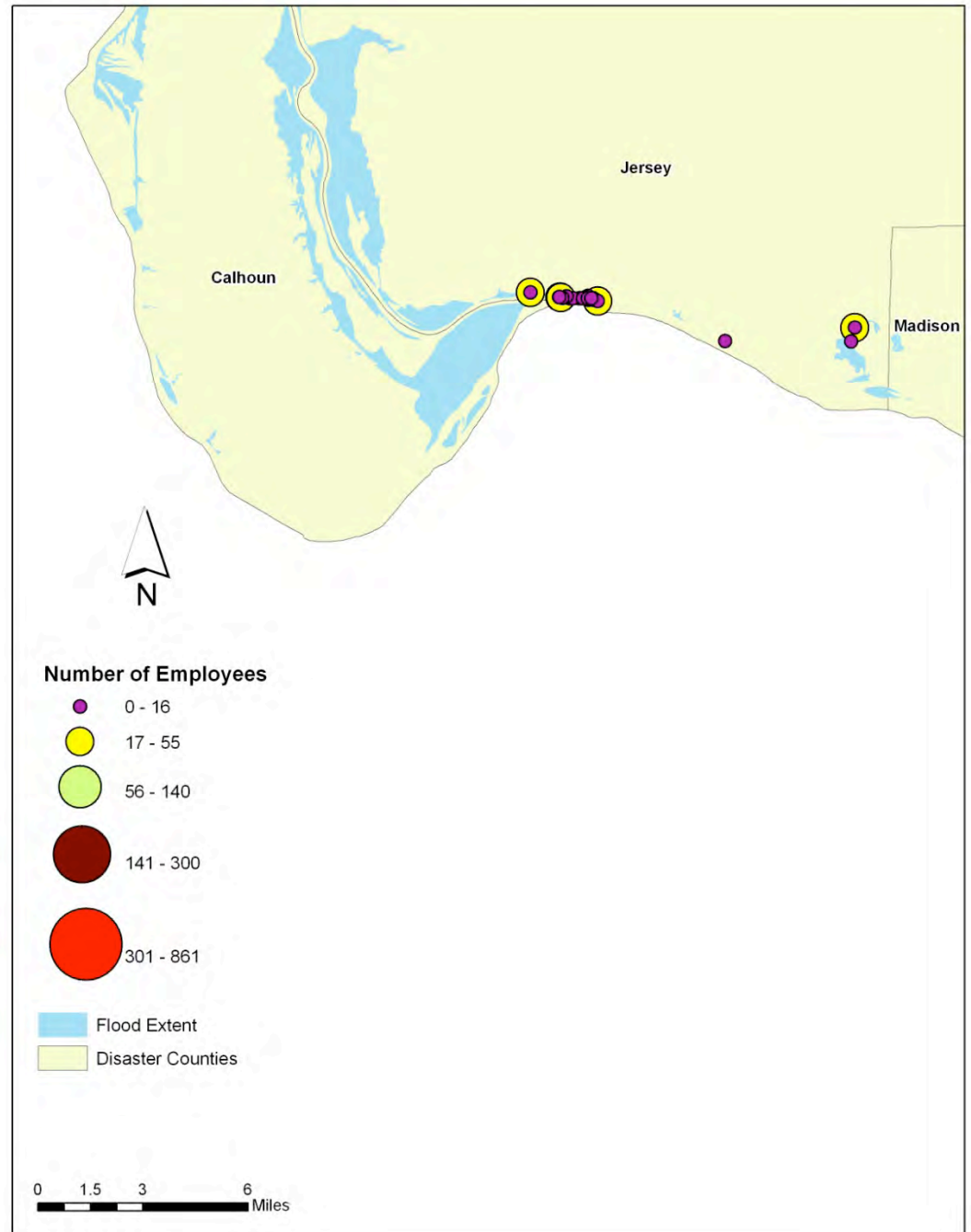
# III. Businesses Affected by Flooding



# III. Businesses Affected by Flooding



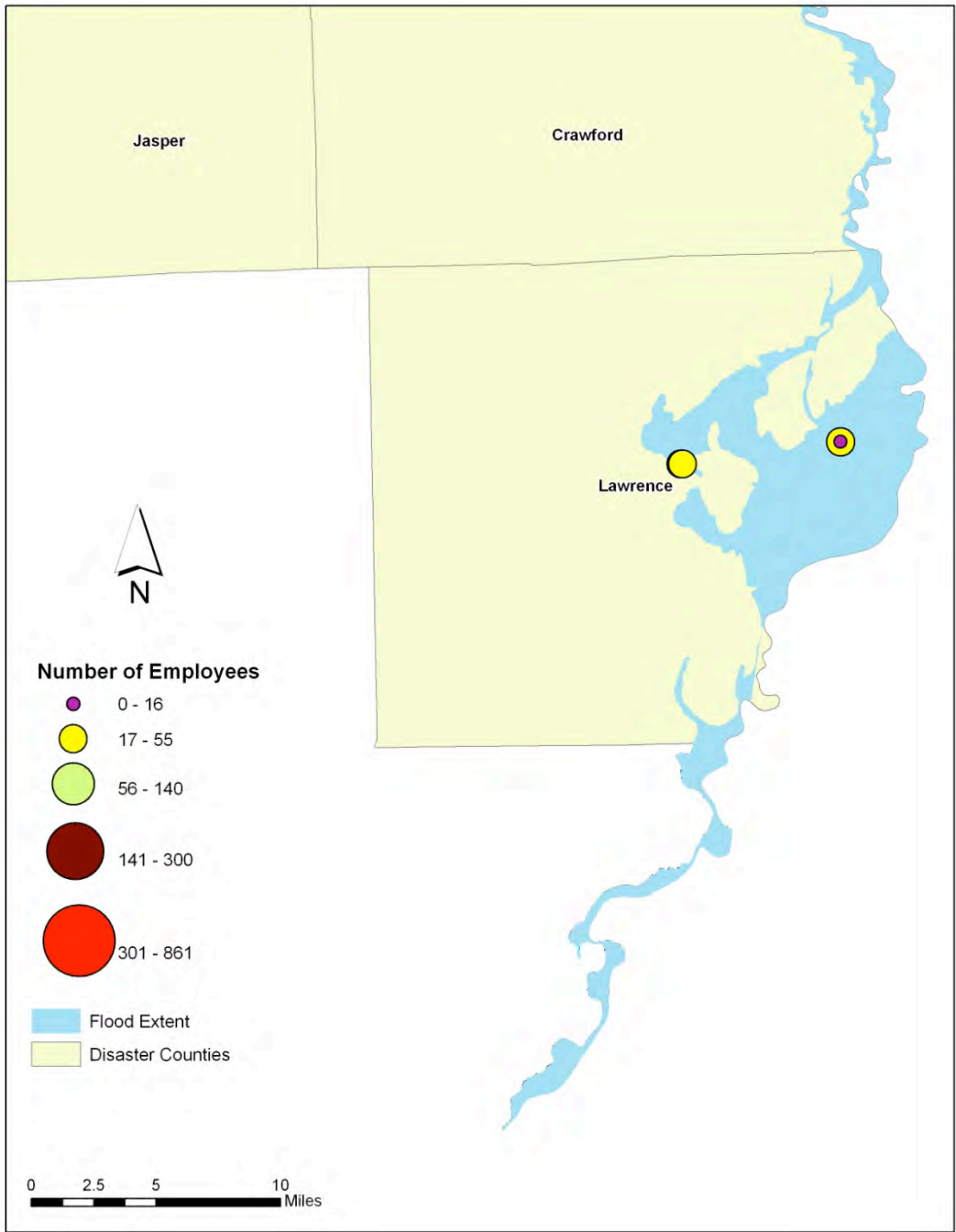
### III. Businesses Affected by Flooding





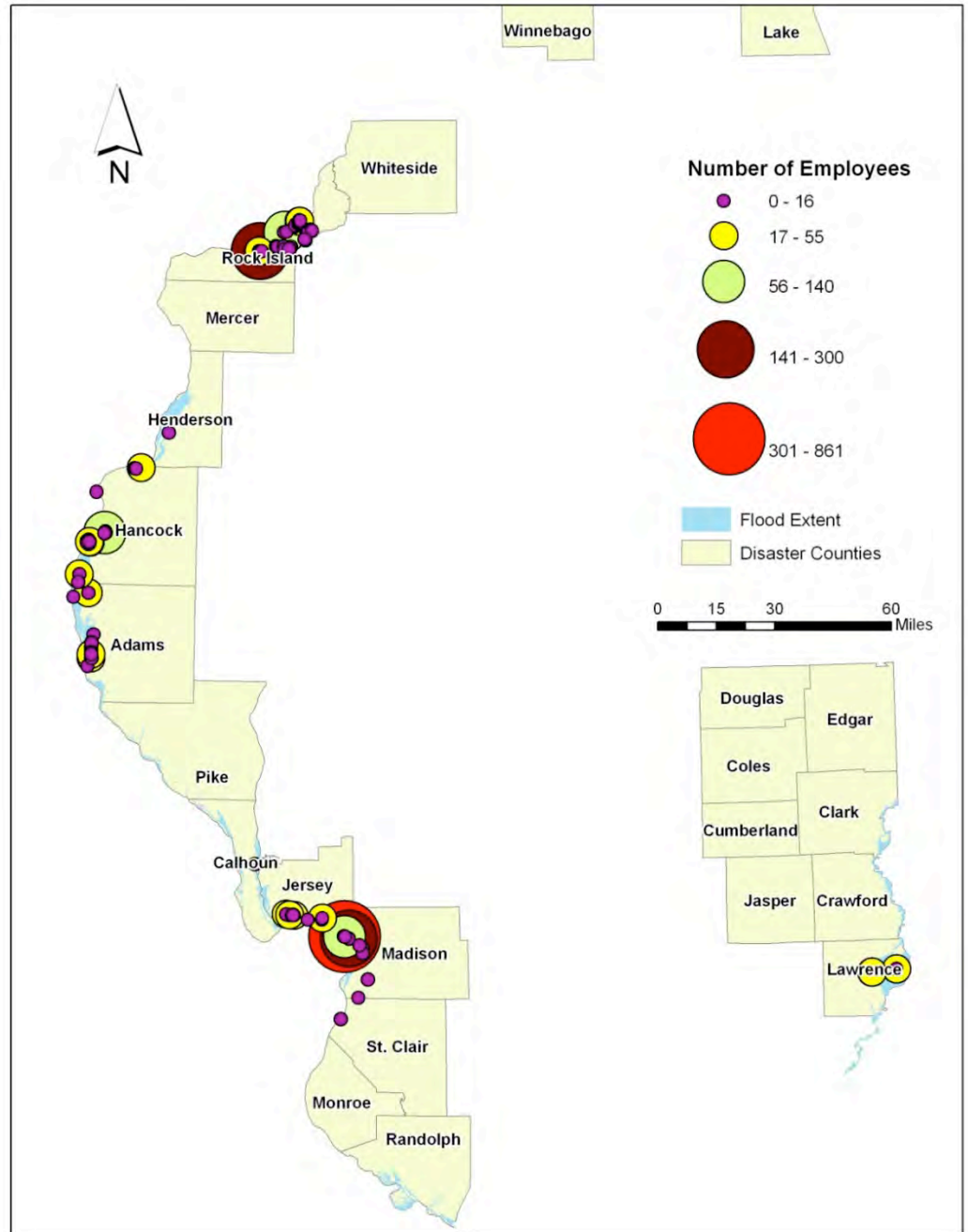
# III. Businesses Affected by Flooding

- ▣ Businesses Affected Wabash
  - Businesses within Inundation Zone
    - ▣ 16
  - Businesses Count - Sales volume
    - ▣ 56,652,000
  - Businesses Count - Number of Employees
    - ▣ 150





<b>Businesses within Inundation Zone</b>	<b>326</b>
<b>Businesses - sales volume</b>	<b>759,048,000</b>
<b>Businesses - number of employees</b>	<b>3,134</b>



# III. Businesses Affected by Flooding



Directory of Businesses in the Identified Flood Zones

Company Name	Post Office	County	NAICS	NAICS Sector Description
LARRY BENSON FARMS	LAWRENCEVILLE	Lawrence	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
UNCLE ANDY'S PRODUCE RANCH	GRAFTON	Jersey	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
GREEN EARTH GREENHOUSES	GODFREY	Jersey	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
APPLE VALLEY BOARDING KENNEL	EAST MOLINE	Rock Island	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
ADWELL CORP	WARSAW	Adams	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
BREAK HUNTING PRESERVE	WARSAW	Hancock	11	Sector 11--Agriculture, Forestry, Fishing and Hunting
GENERAL SAND & GRAVEL	ROCK ISLAND	Rock Island	21	Sector 21--Mining
AMERICAN WATER	ALTON	Madison	22	Sector 22--Utilities
VINSON & SILL INC	LIMA	Adams	23	Sector 23--Construction
BHA SENTEX	MOLINE	Rock Island	23	Sector 23--Construction
SHAFFER CONSTRUCTION CO	QUINCY	Adams	23	Sector 23--Construction
WIDMAN CONSTRUCTION INC	GODFREY	Jersey	23	Sector 23--Construction
J D CONSTRUCTION	GODFREY	Jersey	23	Sector 23--Construction
300+ more businesses in full directory....				

# Totals Flood 2008

## Mississippi River Impacts (IL)

Total Acres Inundated	198,384
Total Acres Inundated within 100 yr Floodplain	183,169
Cropland Acres Inundated	77,693
Leveed Areas Inundated	82,438
Bridges Inundated	57
Miles of Road Inundated	511
Miles of Rail Inundated	71
Businesses in Inundation Zone	310
Businesses - sales volume	702,396
Businesses - # of employees	2,984

## Wabash River Impacts (IL)

Total Acres Inundated	68,613
Total Acres Inundated within 100 yr Floodplain	67,734
Cropland Acres Inundated	33,912
Leveed Areas Inundated	N/A
Bridges Inundated	26
Miles of Road Inundated	201
Miles of Rail Inundated	16
Businesses in Inundation Zone	16
Businesses - sales volume	56,652
Businesses - # of employees	150

# Both Rivers

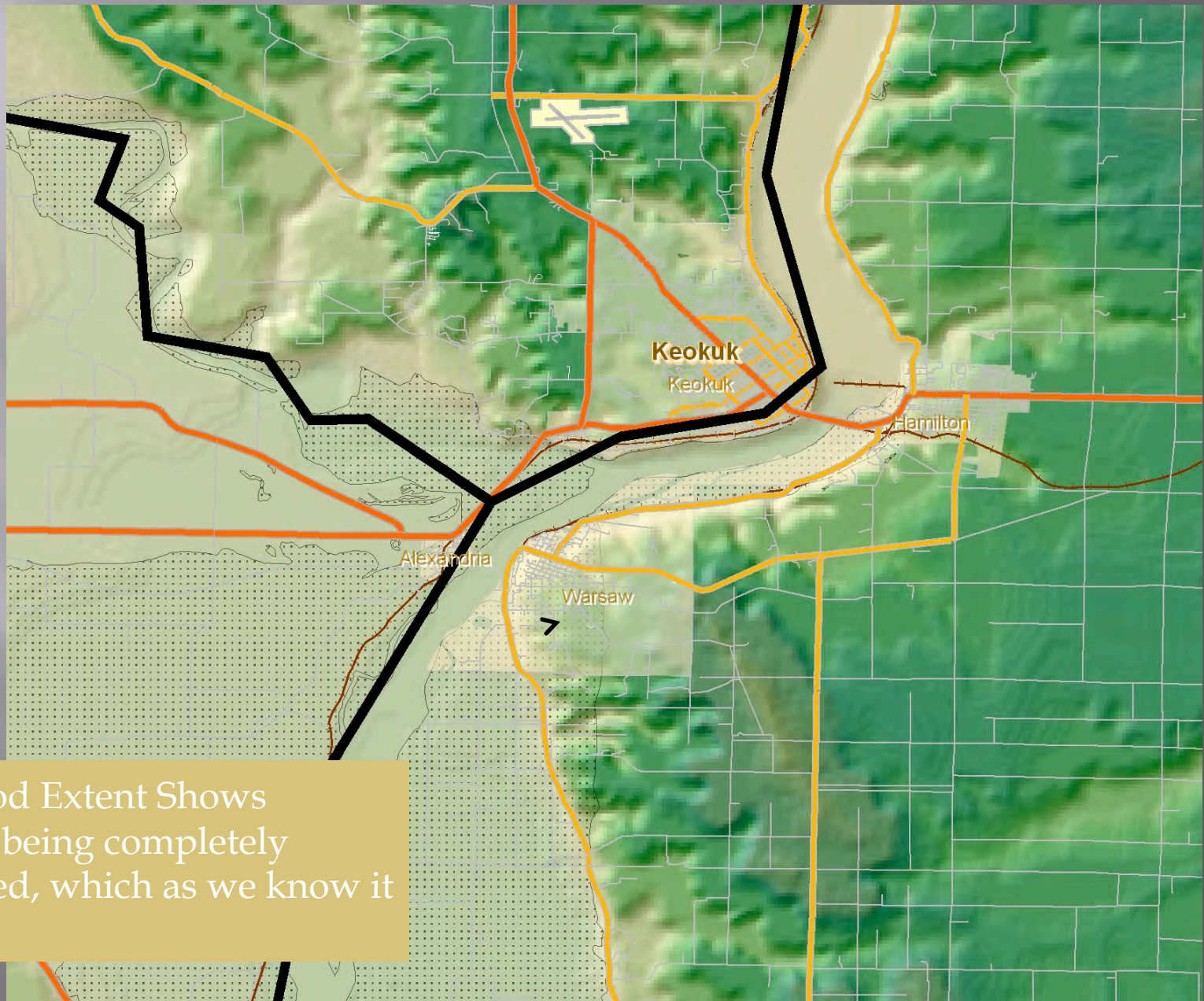
∴		
Total Acres Inundated		266,997
Total Acres Inundated within 100 yr Floodplain		250,903
Cropland Acres Inundated		111,605
Leveed Areas Inundated		82,438
Bridges Inundated		83
Miles of Road Inundated		712
Miles of Rail Inundated		87
Businesses within Inundation Zone		326
Businesses cont - sales volume		759,048
Businesses cont - number of employees		3,134

# IV. Data Limitations

Mapping Flood Extents in Urban areas can be very tricky.



# IV. Data Limitations



Our Flood Extent Shows Warsaw being completely inundated, which as we know it was not.

# V. WIU GIS Flood Assessment Tool

## Site Selection Tool



- ❑ This is an interactive GIS mapping tool for identifying information on infrastructure, resources, culture, and census can be viewed on a map in any combination with most of the layers appearing at a 950,000 scale (about a 3 county area).
- ❑ Additional detail or attributes are available on certain map layers covering such items as contact information. This site selection tool, funded though DCEO could also be used by local elected officials, businesses and any other interested party to help rebuild communities and infrastructure after the flood.
- ❑ Available at: [www.value-added.org](http://www.value-added.org)

# VI. Data Sources

Dartmouth College

ESRI Business Analyst (Info USA)

EMSI

FEMA

USDA

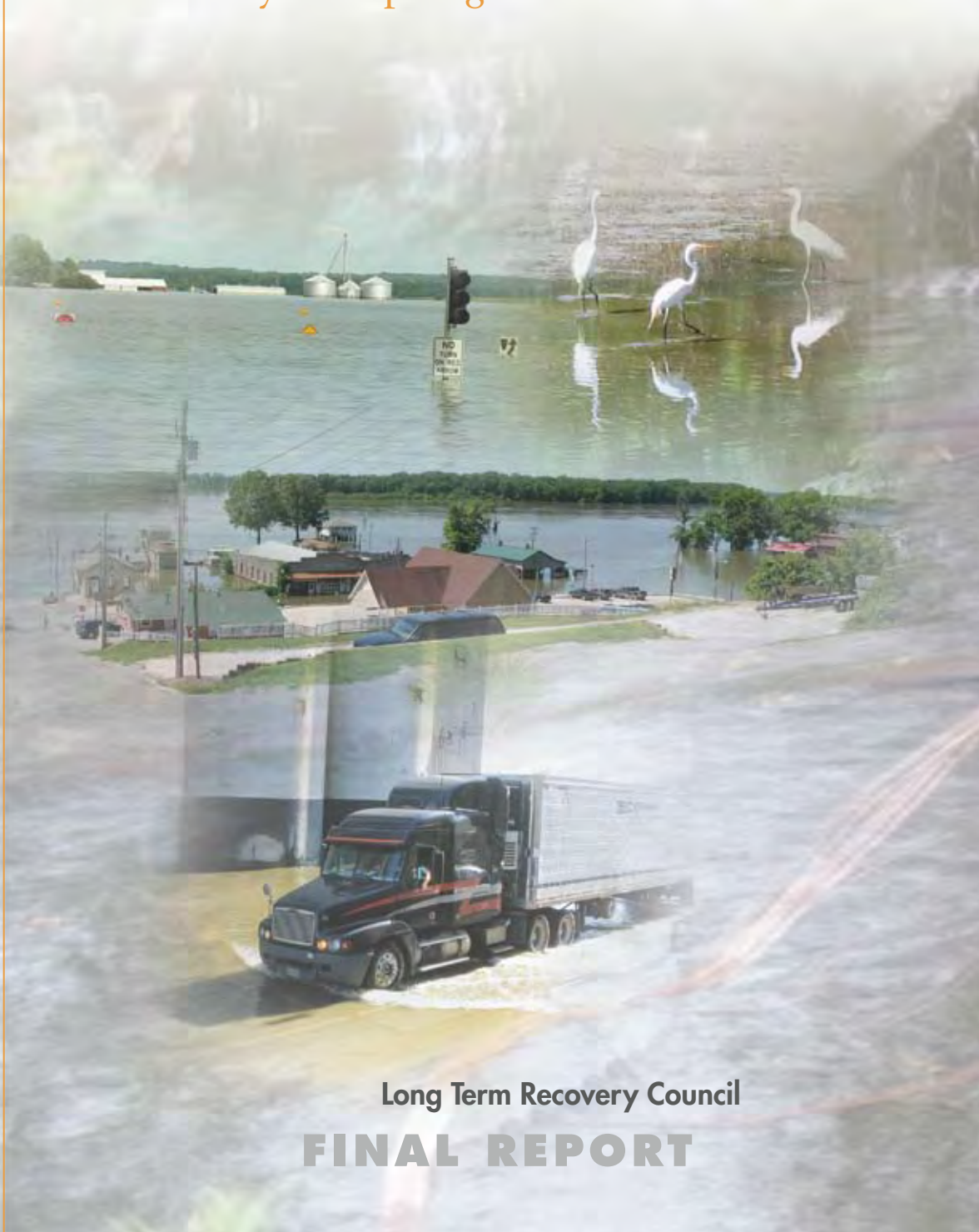
USACE

U.S. Census Bureau



# Appendix B

## Long Term Recovery Council Study Group Organizations



Long Term Recovery Council  
**FINAL REPORT**

## APPENDIX B – LONG TERM RECOVERY COUNCIL STUDY GROUP ORGANIZATIONS

- *National Great Rivers Research and Education Center* (NGRREC - [www.ngrrec.org](http://www.ngrrec.org)) A partnership of the University of Illinois, Lewis and Clark Community College, and the Illinois Natural History Survey. The Center's staff conducts research and education programs to increase our understanding of big rivers, their watersheds and floodplains, and the interaction between the rivers and their human, plant, and animal communities.
- *University of Illinois Extension* is a primary outreach arm of the University of Illinois as a Land Grant Institution. Extension delivers education directly to residents of the state in four main subject matter areas: 4-H/Youth Development, Family and Consumer Sciences, Agriculture and Natural Resources and Community and Economic Development. Extension's experience in flood recovery involves all of those areas from helping children cope with the disaster, to food and drinking water safety, to restoration of production agriculture, to assisting communities in responding to the economic challenges of a disaster including assistance with mitigation planning.
- Extension's *Community and Economic Development Team* is composed of over 30 professional staff members located across Illinois in county, multi-county or regional positions. Staff members have expertise in Community Development, Economic Development, Leadership Development, and/or Organization Development. They provide programming and technical assistance to community leaders, organizations, nonprofit associations, and local officials.
- University of Illinois Extension's *Community Assessment and Development Service* (CADS) works with communities and community decision-makers to gather information used to make community decisions. Specific services include survey development and analysis, reviews of various demographic and development data, GPS mapping, and other applied research processes. Members of this group have been involved in assisting communities in the flooded area in their mitigation planning.
- *Illinois ResourceNet*: A Funding Access Initiative (IRN) is a university-based resource providing Illinois nonprofits and local governments with the competitive assets to access federal funding. IRN offers organizations a unique approach to grant access centered on providing information and resources on an interactive website, working with experienced technical assistants on designing high caliber proposals, and connecting with a diverse group of partners and federal agencies to meet proposed project goals. [www.illinoisresource.net](http://www.illinoisresource.net)

IRN is a partnership of University of Illinois at Chicago, Great Cities Institute - Neighborhoods Initiative and University of Illinois Extension. IRN has been working with communities and counties in preparing funding applications for planning grants and property acquisitions. IRN has been identifying funding opportunities based on needs in communities.

- *Information Technology and Communication Services (ITCS)* is a unit of the College of Agricultural, Consumer and Environmental Sciences which supports the college and Extension in six main areas: Computer Support Services, Instructional Support, Marketing and Distribution, News and Public Affairs, Photo-Video and Web Management and Support. Many of the services provided by ITCS involve collaboration between those function areas.
- The *Illinois State Water Survey* (part of the Institute of Natural Resource Sustainability) provides sound scientific and engineering data that are a necessary foundation for making wise decisions related to water resource issues and other issues such as climate change, severe weather, and air quality. The Water Survey also provides scientific and engineering data to researchers and the public.
- The *Department of Urban and Regional Planning* nurtures – creates, articulates, teaches, and shares—skills and knowledge that enable planning professionals to 1) bring a comprehensive view to specific planning situations and 2) help citizens to achieve fulfilling and just human settlements that are ecologically, economically, and socially sustainable.
- The *Regional Economics Applications Laboratory*, located at the University of Illinois at Urbana-Champaign, focuses on the development and use of analytical models for urban and regional forecasting and economic development.
- The *Office of Sustainability*, located at the University of Illinois at Urbana-Champaign, is charged with providing leadership to campus units to enhance communication and coordination across campus and with external constituents in implementing the campus' strategic plan for sustainability.
- *University of Illinois at Chicago School of Public Health*, Division of Health Policy and Administration



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