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THE 1993 GREAT MIDWEST FLOOD:

Voices 10 Years Later

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THE 1993 GREAT MIDWEST FLOOD: *Voices 10 Years Later*

A 10th-Anniversary Anthology of Stories of Hardship and Triumph
collected by the
U.S. Department of Homeland Security
Federal Emergency Management Agency
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Contents

Acronyms Used

Some of the following acronyms and initializations are used in this anthology. Others may be encountered by readers who refer to the publications and web sites listed in the Bibliography (page 71).

ASFPM	Association of State Floodplain Managers
CDBG	Community Development Block Grant
DMA 2000	Disaster Mitigation Act of 2000
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FMA	Flood Mitigation Assistance
HMGP	Hazard Mitigation Grant Program
HUD	U.S. Department of Housing and Urban Development
ICC	Increased Cost of Compliance
IDNR/OWR	Illinois Department of Natural Resources/ Office of Water Resources
IEMA	Illinois Emergency Management Agency
IEMD	Iowa Emergency Management Division
KDEM	Kansas Division of Emergency Management
MDEM	Minnesota Division of Emergency Management
NDDEM	North Dakota Division of Emergency Management
NEMA	Nebraska Emergency Management Agency
NFIP	National Flood Insurance Program
SBA	U.S. Small Business Administration
SDDEM	South Dakota Division of Emergency Management
SEMA	State Emergency Management Agency
SFIP	Standard Flood Insurance Policy
WEM	Wisconsin Emergency Management

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Foreword

The 1993 Great Midwest Flood: Voices 10 Years Later is a collection of success stories taken largely from existing sources. These success stories document what effective mitigation can do to prevent future flood disasters. This publication also includes narratives from several "veterans" of the Great Midwest Flood of 1993 who had National Flood Insurance Program coverage and subsequently urged other property owners to buy it too.

The "Great Midwest Flood of 1993" was a landmark event that spanned more than 4 months. Remembering its devastation, 10 years later, may help other property owners and communities at risk from flooding become more aware of the harm that floods can do to lives, property, and infrastructure. This 10th-anniversary anthology will also be, we hope, a source of inspiration and encouragement for those communities and property owners at risk from flooding that there *are* measures they can take—today—to reduce their physical and financial risk from flood hazards.

Acknowledgments

This document is the work of many hands. It is also, by our own admission, incomplete. There are many more stories of effective mitigation taken by the nine affected states, the communities, and the property owners after the 1993 flood that are not reported here. And there are many more accounts of property owners who have come to realize the value of flood insurance protection as a result of the 1993 flood. So what we offer here is only a sample of the work that has been done in the Midwest to protect people and property from floods since the hard lessons of 1993.

A special thanks goes out to the organizations that provided consultation, documents, and other support for this anthology. Among the many are the Association of State Floodplain Managers and the NFIP Bureau and Statistical Agent. Regardless of source, all of the stories have a common theme: the value of mitigation and flood insurance as key tools to lessen the impact of future floods.

The states, communities, and people affected by the 1993 flood, as well as FEMA Regions V, VII, and VIII, and the Mitigation Division of the U.S. Department of Homeland Security, have all worked in partnership to achieve the mitigation successes documented in this anthology.

Finally, special thanks and recognition go to the community officials and private citizens who offered their insights on the value of flood insurance protection and the benefits of mitigation.

Introduction

The Great Midwest Flood of 1993 was among the most devastating natural disasters in our nation's history. The National Weather Service ranks this flood as one of the greatest ever to have hit the United States.

The flooding started in late May 1993—10 years ago—and lasted until September of that year. In some places the floodwaters didn't subside until October. More than a thousand levees in the Midwest failed or were overtopped as flooding exceeded the presumed "worst-case" design specifications. At 600 monitoring points in the Midwest, rivers were above flood stage during this event.

Nine states were affected: North Dakota, South Dakota, Nebraska, Kansas, Minnesota, Iowa, Missouri, Wisconsin, and Illinois. Fifty people lost their lives. Fifty-four thousand people were left homeless and needed emergency shelter or extended temporary housing. Fifty thousand homes were destroyed or damaged, and 75 communities were completely under water. According to a nationally commissioned study[1], property damages ranged between $12 and $16 billion. When economic losses are added, the total is much higher.

The effects on transportation and commerce from the Great Midwest Flood of 1993 were staggering. For almost 2 months, barge traffic along the Missouri and Mississippi Rivers was at a standstill as was railroad traffic in virtually all of the Midwest. From Davenport, Iowa, downstream to St. Louis, Missouri, bridges along the Mississippi River were out of commission or inaccessible. It was the same story along the Missouri River. The 1993 Midwest Flood shut down 10 commercial airports.

The estimated federal response and recovery costs exceeded $4.2 billion in direct federal assistance. The federal government also made disaster loans totaling $621 million to individuals and businesses.

The expenditures of the Federal Emergency Management Agency, now part of the Emergency Preparedness and Response Directorate in the U.S. Department of Homeland Security, totaled $1.14 billion. Those disaster costs included:

- $371 million in grants to individuals and families for temporary housing, home repairs, unemployment payments, and other disaster-related expenses;

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[1] *Sharing the Challenge: Floodplain Management into the 21st Century,* a report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force, Washington, DC, June 1994.

- $519 million in grants primarily to states and local governments for public property restoration and clean-up work;
- $158 million in grants primarily to states and local governments for property acquisitions and other hazard mitigation projects;
- $32.3 million to other federal agencies for the delivery of emergency supplies and other mission-assigned work; and
- $60 million in administrative costs.

Total disaster costs would have been even higher, except that flood insurance policies issued by the National Flood Insurance Program reduced the total federal disaster outlay by $271.3 million with flood insurance claim payments to its policyholders. These property owners had paid their own way through the purchase of flood insurance.

Appendixes A and B provide additional statistical data about the flood and its aftermath. But numbers don't tell the whole story.

The 1993 Great Midwest Flood: Voices 10 Years Later lets us hear directly from survivors of the 1993 flood, including officials of flooded communities. In their own words, they tell us, 10 years later, what the Great Midwest Flood of 1993 did to them, their property, or their communities, and what they have learned about the value of mitigation and the benefits of flood insurance protection.

Although these stories were contributed by people in many walks of life, the themes are remarkably consistent and unmistakably clear:

- People who don't have flood insurance protection need to buy it.
- People who have flood insurance protection need to keep it.
- People outside of Special Flood Hazard Areas, where flood insurance is required, need to take stock and buy the protection as well.
- Removing buildings from the floodplain reduces the economic and human costs of flooding.
- Other forms of mitigation, such as elevation and floodproofing, prevent future flood damage and help save taxpayers' dollars.
- Only mitigation can end the desperate cycle of repetitive flood losses.

You'll hear from ordinary citizens, business owners, and community officials about the wisdom and benefits of protecting their physical and financial interests from flood losses.

Let's listen.

FEMA Region V

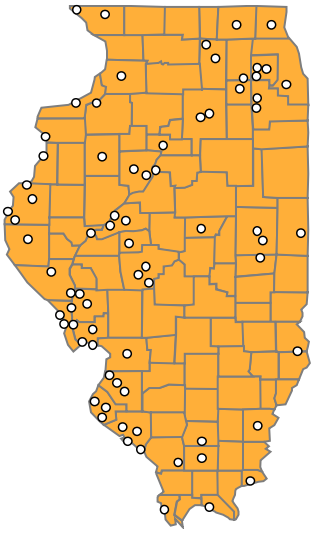
Mitigation Success Stories

FEMA Region V serves Illinois, Indiana, Michigan,
Minnesota, Ohio, and Wisconsin.
For contact information, see the FEMA Regional Offices list on pages vii-viii.

Illinois's Winning Formula in Floodplain Management

After many Illinois river communities experienced the devastation of the Great Midwest Flood of 1993, it became obvious that floodplains are easily reclaimed by rivers during and after severe weather events. With a combined formula to enforce local floodplain regulations and return the floodplain to its natural purposes, the State of Illinois has succeeded in reducing damage from the most frequent cause of disaster declarations in Illinois.

Flooding has been a constant drain on emergency response and recovery resources in Illinois. The state's geography includes 900 rivers and waterways with a combined length of 13,200 miles. The state is bordered by 880 miles of the Mississippi, Wabash, and Ohio Rivers. The state's mitigation initiatives have resulted in the purchase of more than 3,500 flood-prone structures and some adjacent vacant lots (as of July 2002).



Each dot on this Illinois map represents one of 74 acquisition project sites.

Communities benefit when these parcels are returned to their natural functions. Using voluntary acquisition grant programs, the Illinois Emergency Management Agency (IEMA) has approved and administered more than $100 million in project activities including flood mitigation, ice storm preparedness, and wind-resistant construction.

IEMA and the Illinois Department of Natural Resources/Office of Water Resources (IDNR/OWR) are aggressively pursuing the reduction of flooded properties, having proactively completed a detailed analysis of the National Flood Insurance Program repetitive loss structure inventory. More than 30 percent of these properties have already been removed from this list through voluntary buyouts.

A Winning Recipe

The recipe for reducing flood damage can be attributed to the two-fold approach of eliminating existing flood problems and of controlling new development in the floodplain, according to Paul Osman, Floodplain Management Program Coordinator, IDNR/OWR.

The success of the acquisition and floodplain management programs along the Illinois and Sangamon Rivers became evident during a recent flood event in the spring of 2002. (The table on page 5 details the acquisition projects.) The Sangamon River reached 10 feet over flood stage, and the Illinois River topped at 15 feet over flood stage. County emergency managers and local floodplain administrators reported that, had the buyouts not taken place, many more houses would have been inundated with floodwaters.

Jan Horton, Illinois State Mitigation Officer, remarked that, at the confluence of the Illinois and Mississippi Rivers at the City of Grafton, an estimated 200 more people

would have faced the trauma of cleaning up had not 88 structures been removed from the floodplain by a successful buyout project.

When you are committed to the challenge of reducing persistent flood damage, it requires a staff with creativity and determination, according to Horton. "To be successful, you have to think outside of the box, have a can-do work ethic, and avoid getting discouraged," said Horton. "Thinking creatively means keeping a positive attitude and strategizing to look at challenges in new ways to assist communities within the limits of the law."

After the 1993 floods and subsequent acquisition program, IEMA organized the Interagency Mitigation Advisory Group (IMAG) to facilitate the implementation of various mitigation programs. In addition to IEMA, the group is composed of a variety of agencies, including the IDNR/OWR, Illinois Historic Preservation, Department of Commerce and Community Affairs, FEMA, and the American Red Cross, with staff who can provide expertise in acquisition and elevation projects.

> *"When you get the people out of the floodplain, you don't have to boat in and rescue residents. You don't have to evacuate, put up road blocks, and rebuild where the floodwaters will surely be back."*
>
> Jan Horton, Illinois State Mitigation Officer

"With the IMAG, we can bring in all the agencies involved in the mitigation conversation," explained Horton. "Together, we conduct reviews, research, and evaluations, and make prioritizations and recommendations."

In addition to the creation and use of the strong partnerships developed in the IMAG, Horton attributes the success of the state's acquisition program to several factors:

- support from the Governor's Office;
- a close relationship with FEMA, a partner on the IMAG;
- an appraisal review process at the state level to ensure reliability and consistency; and
- dedicated state staff and the involvement of local officials.

Acquisitions are a very visible and tangible example of success. "We've made a dent in getting people out of the way of floodwaters. The more houses we buy out in an acquisition program, the more the river can do what it wants and flooding becomes a non-event," said Bob Sherman, IEMA Mitigation Planner.

In working toward the goal of damage prevention and the decrease of subsequent recovery dollars, in that one area of risk called the floodplain, IEMA is leading the way in making Illinois a better place.

Funding for Acquisition Projects in the Illinois and Sangamon River Watersheds

	Acquired Units	FEMA HMGP[1] Funds	DCCA/IDNR[2] Match Funds	Total Cost
Illinois River Watershed	672	$11,114,035	$7,750,218	$18,864,253
Sangamon River Watershed	156	$2,613,276	$993,853	$3,607,129
TOTAL	828	$13,727,311	$8,744,071	$22,471,382

[1]Federal Emergency Management Agency's Hazard Mitigation Grant Program
[2]Illinois Department of Commerce and Community Affairs/Illinois Department of Natural Resources

Grafton, Illinois: Sound Floodplain Management Helps Community Rebuild

Grafton, Illinois, is a river town. Located at the confluence of the Illinois and the Mississippi Rivers, the city grew because of its proximity to the river network and developed its character based on river life. Grafton has also suffered from the devastation of floodwaters and the hard decisions that come when recovering from a disaster. But through mitigation and the enforcement of floodplain regulations, the city has turned around its flood-prone reputation, while maintaining its river heritage.

The Flood of the Century

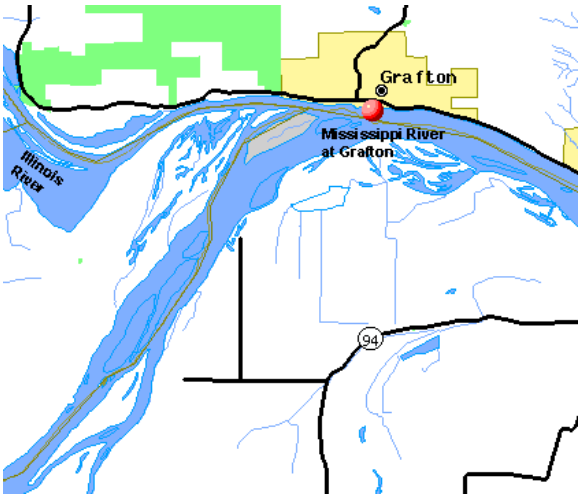
The Great Midwest Flood of 1993 was the most destructive in recent history because of record crests on the rivers and the extended duration of the high waters that remained above flood stage for 180 days. In one area of town, floodwaters reached a depth of 15 feet, submerging rooftops.

Flooding kept people from returning to their homes for months. Some residents couldn't ever return. Once the waters receded, many homes were uninhabitable because of the mud, mold, and water damage.

Thousands of hours and dollars were spent on the response and recovery. National Guard troops were deployed to the area; the Illinois Department of Transportation built a temporary road to keep the city from being isolated; FEMA travel trailers provided temporary shelter for those who were forced from their homes; and the American Red Cross and the Salvation Army provided food for volunteers and flood victims. Mayor Richard Mosby remembers a day, months into the flood, when he was in a johnboat getting from one end of town to another and asked a friend if he thought they would ever experience a normal day in Grafton again.

Floodplain Management and Mitigation Implementation

Since 1973, the city has participated in the National Flood Insurance Program (NFIP) and adopted rules regarding development in the floodplain. "One of the hardest jobs for a local official is implementing floodplain ordinances, but enforcement of the rules is what prevents future flood disasters in places like Grafton," explained Paul Osman, Floodplain Management Program Coordinator, Illinois Department of Natural Resources/Office of Water Resources.



The Illinois River flows into the Mississippi River at Grafton, Illinois—often, until flood hazard mitigation, with disastrous consequences.

"They have to keep new buildings and development out of the floodplain. And, when there is a flood, they have the thankless job of assessing the damage and having to tell some people whose homes are

substantially damaged that they can't rebuild in the floodplain."

That difficult job was held by Richard Mosby, who was Zoning and Building Inspector during the time of the buyout program in Grafton. "To be able to participate in the NFIP and receive the help from the program when you needed it, you had to enforce the floodplain rules," he commented. "A good floodplain manager is one with the ability to say no."

Rebuilding from such a devastating flood takes time and perseverance. In the aftermath of the disaster, to comply with the local floodplain ordinance, dozens of flood-damaged homes in Grafton were assessed for damage. To ensure that the evaluations were unbiased, the city hired a professional appraiser to assess those structures with damages falling in the range of 40 to 60 percent. Structures that sustained damages above 50 percent of the market value of the building were required to be elevated or removed.

Grafton was never to return to the days before the flood. A total of 70 houses and 18 commercial buildings were acquired and removed from the floodplain, at a cost of $2,320,980 in disaster-activated Hazard Mitigation Grant Program (HMGP) funds from FEMA and $773,636 in matching funds from the Illinois Department of Commerce and Community Affairs. The program presented residents with an opportunity to move out of the path of repetitive flooding.

The city obtained federal and state grants to help develop building lots on higher ground, far above the floodplain. The new building site of Grafton Hills eventually offered building sites for some residents who participated in the buyout and for the city to grow as it recovered from the flood and the initial loss of population. The vacated land near the river now contains a bike path and parkland, and plans are in place to build a marina on other open parcels.

"In the floods since '93, the number of people impacted by them is significantly less," said Mayor Mosby. "If it had flooded like this before the buyout, at least 40 families would have been affected by floodwaters. In this last flood, even though we had the inconvenience of road closures, there were probably less than a dozen people whose homes were affected at all."

How Flood Mitigation Pays for Itself

"Whenever you heard of flooding on the Mississippi River, Grafton was always at the top of the list. It flooded nearly every other year," says Ron Davis, Hazard Mitigation Specialist with the Illinois Emergency Management Agency.

Statistics from the National Flood Insurance Program bear out that observation: some properties had up to seven claims each since 1973, and a total of $4,267,519 in claims was paid to Grafton flood insurance policyholders from 1978 through 2001. The 1994 acquisition program, funded 75 percent by FEMA's Hazard Mitigation Grant Program and administered by the state, removed structures that had accounted for $906,000 of repetitive loss claims.

Flooding in years since the buyout (1995, 1996, 1998, 2001, and 2002) caused no significant damage, and response and recovery costs have been dramatically reduced, demonstrating the benefits of a well planned and coordinated buyout program and good floodplain management.

Changing the Devastation of Flooding, One House at a Time

Alice and Orville Snater had seen it all before. Runoff from heavy spring 2000 rains caused the Cedar River, Dobbins Creek, and Turtle Creek, which converge in their southeastern Minnesota city of Austin, to yet again overflow their banks.

But this time the Snaters and more than 150 other families were spared the devastating damages of muddy, fast-flowing floodwaters. Through a concerted effort of citizens and local government, and with the help of state and federal agencies, acquisition projects began after severe flooding in 1978. The buyout program helped families move out of the floodplain and into homes that remained dry during the 2000 flood.

> *"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has."*
>
> Margaret Mead

Some of the houses moved with the families, as was the case with the Snaters. Once set near the flowing waters of the Cedar River, and experiencing multiple flooding damages from its waters, the family's sturdy brick house was moved out of the floodplain to a site 12 blocks away.

Floodwaters had swept through the Snaters' home and covered much of the city twice in 1978. Just a few days after they cleaned up from the first July storm, waters escaped the banks and again spread throughout the city. The flooding damaged 400 homes and 25 commercial properties, with losses estimated to have been $12 million.

In response to the flooding of 1978, Alice Snater helped form the Flood Action Citizens Task Source (FACTS) to look at ways to solve the flooding problem. The group, with a membership that reached 450, met and dialogued with the Austin City Council, the Turtle Creek Watershed Board, the Minnesota Department of Natural Resources, the Governor's office, and state and local agencies to gather as much information as possible.

Moving from a home, especially as a result of a natural disaster rather than by choice, can be a very traumatic event. The active participation of Austin residents through the FACTS group helped smooth the transition, as government agencies worked together on voluntary buyouts of homes and relocation of families. In the aftermath of the 1978 flood, 58 homes along the Cedar River were acquired through a Community Development Block Grant provided by the U.S. Department of Housing and Urban Development to the Housing and Redevelopment Authority of Austin.

After flooding damaged 450 homes in 1993, additional buyouts were conducted. Funded under FEMA's Hazard Mitigation Grant Program and the Minnesota Department of Natural Resources, the acquisition project was administered through the Minnesota Division of Emergency Management. With the help of the program, the Snaters and others relocated their houses in 1994.

Altogether, 163 properties were acquired after the floods of 1978, 1988, and 1993. Then the flood of 2000 hit, with the highest recorded crest height of 23.4 feet. But the Snaters, Grohs, Bastyrs, and Earls, and many, many more families who participated in the buyout program, now had the security of knowing they were beyond the flood's reach.

Of her experience with flooding and mitigation, Alice Snater says, "It boils down to citizens taking an active part and getting with local government agencies and groups to come up with a solution. You need to respect each other's opinions, even though you don't always agree. Once you start cooperating and working together, it goes much more smoothly."

An analysis of the acquired structures and subsequent flood events in the Austin area revealed losses avoided of more than $3.9 million on buildings bought for $1.7 million after the 1978 flood—a return on investment of 129 percent.

Alice and Orville Snater on the deck of their house, which was relocated out of the floodplain in Austin, Minnesota.

The background and statistics on the acquisitions are detailed in the Post-Disaster Economic Evaluation of Hazard Mitigation Loss Avoidance Report *available from FEMA Region V, Hazard Mitigation Division.*

For contact information, see the FEMA Regional Offices list on pages vii-viii.

Saving an Architectural Landmark by Making It Flood Resistant

The former St. Paul's Evangelical Lutheran Church will still be a gathering place.

Despite decades of repetitive flood damage to its interior and a subsequent buyout by FEMA and the city of Austin, Minnesota, the structure will again host celebrations. On a Sunday in July of 2001, an audience that included more than 100 veterans stood by when the former church was dedicated as the Veterans Pavilion in the new Community Park along the Cedar River.

To stop the cycle of flooding, cleanup, and costly repairs in a neighborhood bordering the river, an acquisition program was begun after severe flooding in 1978. The project was supported by the Flood Action Citizens Task Source, the city of Austin, the Minnesota Department of Emergency Management, and the Federal Emergency Management Agency (FEMA). More structures were designated for buyouts after flooding in 1993.

In the acquisition program, structures sturdy enough to be moved were relocated out of the floodplain, while others were demolished and removed. The goal was to prevent future flood damage and protect lives by removing structures from the 100-year floodplain. Based on the many floods of record in past decades, this goal has clearly been met.

The flood-proofed, former St. Paul's Evangelical Lutheran Church withstood 2002 flooding. (Photo: Nate Howard, Post Bulletin)

The fate of St. Paul's Evangelical Lutheran Church seemed to be that of demolition. Completed in 1953, the church building suffered costly flood damage in 1965 and 1978. With a $100,000 loan from the U.S. Small Business Administration, the congregation was able to rebuild the church, occupying the building once again in 1980.

More damages incurred in the 1993 flood prompted the church leadership to participate in Austin's voluntary buyout program. The congregation relocated to temporary facilities and eventually built a new church in another part of town—away from the floodwaters. The original church structure was slated to be razed.

City leaders and residents considered the church an architectural landmark alongside the river and were disheartened by the idea of demolishing it. A park was planned for the space vacated by the other structures in the buyout program. And parks need sheltered picnic areas. The idea began to take shape that the church could remain in place as an open, public shelter.

"It was a landmark for the city," said Dennis Maschka, Parks and Recreation Director for the City of Austin. "It was too nice of a structure to tear down and it was a nice centerpiece for the whole area."

Mayor Bonnie Besse Rietz and the Austin Housing and Redevelopment Authority (HRA) pursued approval from FEMA to retain the structure in its location. Because the city used funds from FEMA's Hazard Mitigation Grant Program to acquire the property, it had to meet strict criteria.

Requirements stated that the structure could remain as a public facility "open on all sides and functionally related to a designated open space or recreational use" and that, upon completion of the project, "no application for additional disaster assistance will be made for any purpose with respect to the property to any federal entity or source."

The city hired a design firm to assist in developing a renovation plan that would conform to the requirements. The plan was approved by FEMA in early 2000.

"We were able to maintain the architectural integrity of the structure," said Kermit Mahan, Director of HRA. Austin's estimated cost for renovating the building was nearly $200,000. The Department of Natural Resources participated in funding the Veterans Pavilion with a $75,000 grant.

"We filled the basement with sand and poured a 4-inch layer of concrete on top for the floor," said Maschka, who oversaw the remodeling for the city. "We tore the parsonage off the building, and, where the windows were, we sawed them down to the floor, and that made the openings."

The stone edifice of the former St. Paul's Evangelical Lutheran Church, Austin, Minnesota, stands as an example of what can be achieved when people creatively work to solve a problem. The church's congregation did not have to continually undergo the financial and mental strain of recovering from floods—and a beautifully crafted structure was renovated to allow floodwaters to flow through it, making it eligible to remain in the floodplain as a useful park facility for the residents of Austin.

Moving Out of the Floodplain, House and All

Moving from the River

Jim Retterath's home on Eighth Avenue Southeast in Austin, Minnesota, had been flooded nine times by the Cedar River.

So, in 1994, when the Austin Housing and Redevelopment Authority announced plans to buy out homes in the floodplain, Retterath was among the first affected homeowners to express interest.

Before long, he had relocated his house to northwest Austin, on the other side of the Cedar River and well out of the floodplain.

Jim Retterath's Austin, Minnesota, house is moved to higher ground across the Cedar River. (Photo: Gene Lifka, Hormel Foods Corp.)

In an interview with the *Hormel News Magazine*, Retterath said, "They were offering me a chance to get out, and I took it. It was strictly voluntary. Now that we're here and getting everything in shape, everyone is happy about it. I know we did the right thing."

An Established Neighborhood Gets New Neighbors

Affordable lots can be hard to find in a small city like Austin with a population of 22,000. This is especially true in the midst of a buyout program, when a number of people are interested in moving their own homes or homes they bought at auction out of the floodplain onto a safe, dry lot.

In early 1994, Austin's outdated Shaw Elementary School was torn down by order of the Board of Education. The demolition opened up a whole city block in an established neighborhood for new houses—or old houses, as it turned out.

The timing was right for the city to purchase the land from the Board of Education and offer lots for sale with a first priority to those houses being moved out of the floodplain. Five houses once damaged by floodwaters found quiet, safe surroundings about six blocks from the river.

The city of Austin, Minnesota, bought a cleared city block and sold five of the lots to owners of homes that were being moved out of the floodplain.

A Mayor's Story: Flood-Proofing the Historic Main Street in Darlington, Wisconsin

"Main Street is the heart of a community," said Bev Anderson, former mayor of Darlington, Wisconsin, and current City Council member. "When you go downtown to Main Street, you can really see what a community is like."

Brick storefronts with decorative roof facades, second-story bay windows, large street-level display windows, and brightly painted doors greet visitors to this riverside community's historic downtown Main Street. The deep, narrow buildings were constructed between 1858 and 1940 and make up the Main Street Historic District, listed on the National Register of Historic Places.

But just inside the doors of those historic buildings, customers see a highly engineered flood-proofing technique to protect against the floodwaters from the nearby Pecatonica River. Interior vestibules built with floodwalls and removable flood shields allow the buildings to keep their street-level historic entrance, while elevating the first floor above the Base Flood Elevation.

Some of the charming shops on Main Street in downtown Darlington, Wisconsin: Just inside the colorful doorways, and not visible from the street, high-tech flood-proofing technology ensures that these historic buildings—and the businesses they house—will prevail when the Pecatonica River overflows its banks again.

The Quest to Preserve a Deteriorating Downtown

Mayor Anderson was instrumental in galvanizing the community to implement creative measures in order to solve major flooding problems and growing economic concerns. In the 1990s, Darlington, located in the heart of Wisconsin's prime farmland, was contending not only with a decline in the agricultural economy but also with multiple flood events that were deteriorating the city's historic buildings.

> *"The Darlington Mitigation Project illustrates the positive outcome of people in a community working together with government to accomplish local goals. If you put your heads together, and have a driving force, you can accomplish great things for your community."*
>
> Roxanne Gray
> State Hazard Mitigation Officer
> Wisconsin Emergency Management

Residents of Darlington knew flooding all too well. Floodwaters in 1937, 1950, 1959, 1969, 1990, and 1993 rushed up Main Street filling basements and first floors.

Envisioning the Future of Darlington

"The success of our flood mitigation and historic preservation definitely proves that planning and having a vision of what could be and looking to the future is certainly the way to go," said Bev Anderson.

After the 1990 flood, community leaders developed a comprehensive plan. The plan that took shape included an extensive flood mitigation effort and focused on historic preservation, economic development, downtown revitalization, and recreation and tourism promotion. The emphasis was to view the river as an asset to the community instead of a "flood liability."

Before the plan could be implemented, the Great Midwest Flood of 1993 struck. After witnessing the destructiveness of another

"I remember as a child in the 1950 flood, seeing my 6-foot-3-inch father carrying things out of our restaurant in water reaching chest high," said Anderson.

flood, business owners and residents were far more ready to buy into creative solutions to the flooding problem. "We were well on our way with the plan and, when money became available, we were ready to go," said Anderson.

With the federally declared flood disaster in 1993, funds from FEMA's Hazard Mitigation Grant Program helped Darlington implement its flood mitigation plan. The city administration undertook the task to retain the historic nature of the downtown buildings and to either flood-proof buildings or remove them from the floodplain.

Preserving and Redeveloping Main Street

Anderson attributes the success of the mitigation project to "building coalitions and forming relationships with many agencies." As mayor, she sought out experts as needed. She also looked to higher levels of government for programs that would help Darlington reach its goals.

The positive effects of the mitigation and refurbishing project were many. "It put value back in the buildings and built up the tax base," said Anderson. "If we would have had one or two more floods, we would not have many buildings left on Main Street."

Contaminated riverside industrial sites were cleaned up and a park created. Opening up the green space near the river created a recreational draw for the community. Since the installment of the trail and river path, an inn was established in one of the historic downtown buildings. The proprietor offers bicycles for the guests' use on the new trail. Her register shows that the inn has rented rooms to people from 23 states and 8 foreign countries.

Although floodwaters have not yet reached storefronts since the flood-proofing, mitigation has already saved business owners time and expense.

"In 2000, we could sit back and watch the water rise. Before, when the floodwaters came, you couldn't wait to see if it was going to get as high as the front door. We would have been moving our inventory out when it started coming up Main Street," said Jim Mathys, owner of Mathys Ace Hardware Store.

Sometimes it takes the steadfast resolve of just one individual to inspire change in a community. Main Street Darlington was where Bev Anderson grew up, working in her parents' restaurant and eventually running it.

With her political savvy, Bev knew that Darlington's economic recovery was vital to the survival of the community. In her role as mayor, Anderson's dedication to strengthening her community, willingness to explore new ideas, and ability to build coalitions helped ensure that Main Street continues to be a vital part of Darlington and the entire county.

For more information on hazard mitigation in Wisconsin, contact Roxanne Gray, State Hazard Mitigation Officer, by phone (608-242-3211) or email (grayr@dma.state.wi.us).

You may also visit the Wisconsin Division of Emergency Management web site for hazard mitigation information (http://www.state.wi.us/agencies/dma).

The City of Darlington can provide more information on its Flood Mitigation Plan and its HMGP project. Contact Phil Risseeuw, Clerk-Treasurer, at 608-776-4972.

FEMA Region VII and
the State of Missouri

Success Stories from the Missouri Buyout Program

August 2002

FEMA Region VII serves Iowa, Kansas, Missouri, and Nebraska.
For contact information, see the FEMA Regional Offices list on pages vii-viii.

Arnold, Missouri: Getting Out of the Floodplain

"We don't worry about floods in Arnold anymore," says Joe Moore, 66. "It used to be every time it rained hard, we flooded. But not anymore."

Not for people like Moore, one of 72 property owners in Arnold, Missouri (pop. 19,965), who participated in the Missouri Buyout Program.

Rather than continually responding to floodwaters, city officials and willing homeowners like Moore resolved to find a permanent answer to prevent or lessen damages to homes during Arnold's frequent floods.

Their solution? Using federal funds from FEMA to buy out homes in Arnold that sat in the floodplain where the Meramec and Mississippi Rivers meet.

Since 1993, the City of Arnold has received more than $2.9 million from FEMA and $1.4 million from CDBG funds to buy out 72 properties in Arnold's floodplain.

Funded by FEMA and administered by SEMA, the Missouri Buyout Program enabled the City of Arnold to purchase Moore's home at preflood value, demolish it, and then deed-restrict the land to open space.

"We got the full value for our home," said Moore, who moved out of his flood-prone home in August 1994. "My wife and I used the money to build a new home on the other side of Arnold, but not in the floodplain."

Asked if he misses his neighborhood and the white frame house that he and his wife, Patricia, called home for 19 years, Joe Moore can only laugh.

"I put sandbags around that old house a dozen times," he said, recalling the house that sat on a dead-end street called Oye Drive. "I fixed up the basement more times than I like to remember. There was no way in the world I wanted to do any of that again."

Arnold, Missouri, resident Joe Moore used his buyout payment to build a new home safely out of the floodplain.

Chances are, he won't have to. Nor will the City of Arnold, the State of Missouri, FEMA, or U.S. taxpayers have to devote significant funding to protect Joe Moore or his former floodplain neighbors during the next flood event or assist them to repair their flood-damaged homes.

Instead, city planners and local residents can turn their attention to planning creative uses for the open space acquired through the buyout.

"We're in the process of planning new ways to redevelop this area that are compatible with the floodplain characteristics," explains Mike Deruntz, Arnold's Community Development Director.

The Shrinking Cost of Flood-Fighting in Arnold, Missouri

	1993 Flood	1995 Flood	May 2002 Flood (as of 6/25/02)
Sandbagging Sites in Arnold	60	3	0
FEMA Public Assistance to Arnold[1]	$1,436,277	$71,414	$0
Applications from Arnold for Individual Assistance	52	26	1

[1]FEMA's Public Assistance program provides funding to repair public facilities, such as roads and bridges, as well as to reimburse local governments for many flood-fighting expenses.

"This is one of the major green land holdings that is readily accessible to a large population in the St. Louis region. We have a park down there now, and we'll be developing trails, ball fields, and other forms of passive, open recreation. Families are coming back and having a positive experience."

Arnold still experiences frequent flooding. In May 2002, the Meramec River crested at its eighth highest level on record.

But unlike the 1993 flood disaster, which highlighted the problem of people living in Arnold's floodplain, the 2002 event proved the cost benefits of getting the people out and the homes razed.

In the process, the buyout also brought peace of mind to residents like Joe Moore.

"We just don't have floods in Arnold like we used to," said Moore, without the slightest trace of nostalgia.

Cape Girardeau, Missouri: Learning What a "100-Year Flood" Is

Cape Girardeau, Missouri, learned the hard way what the term "100-year flood" means.

In 1993, this historic Mississippi River town (pop. 36,625) watched with horror as floodwaters slowly crept up. As the waters rose, so too did the number of volunteers who came from across the nation to help build sandbag levees around the threatened homes.

After the floodwaters damaged 160 homes in Cape Girardeau's floodplain, the volunteers stayed to help locals clean and repair the mud-drenched homes.

At a fall 1993 meeting, the Cape Girardeau City Council considered pursuing a buyout. But what were the chances of the city's experiencing another 100-year flood? What was the rush in removing homes and families from the floodplain?

Two years later they found out.

In the spring of 1995, the river began rising again. But this time, the flood came fast—and the volunteers didn't.

On May 24, 1995, the river crested at 46.7 feet, more than 14 feet above flood stage, and just shy of the highest recorded crest of 48.5 feet on August 8, 1993.

The city had experienced two 100-year floods in a span of 3 years.

As locals learned, a 100-year flood does not mean that such a catastrophic event is likely to happen only once every 100 years. Rather, it means that *every* year, there is a 1-percent chance of such a flood. Over the course of a century, a flood of such magnitude is certain.

Funding for Cape Girardeau, Missouri's, Buyout of 114 Properties in Flood-Prone Areas

	Amount	Percentage of Project
FEMA Share	$1,141,185	41%
State General Revenue Funds	$589,400	21%
Community Development Block Grants	$767,406	28%
City of Cape Girardeau	$79,379	3%
The Salvation Army Midland	$84,000	3%
Interfaith Disaster Response	$82,000	3%
Program Income	$4,845	1%
TOTAL	$2,748,215	100%

By May 28, 1995, 100 homes had flooded in Cape Girardeau's floodplain. Many of them were the same properties that had flooded in 1993. The difference in 1995 was that no one said it wouldn't happen again.

The search for a permanent flood solution began in earnest.

With a creative cost-share between federal, state, and local governments, as well as charitable non-profits, the City of Cape Girardeau eventually bought 114 properties in the flood-prone areas and relocated the residents to safer neighborhoods.

After demolition of the acquired structures, the land was deed-restricted for open space.

Now, the only cost associated with the land is mowing. Best of all, the vast majority of people who lived in the homes and worked in the floodplain neighborhoods are no longer living in harm's way.

In May 2002, the Mississippi River at Cape Girardeau crested at 45.7 feet, its third highest level after the 1993 and 1995 events. But this time, the flooding affected only eight homes.

"It was almost a non-event," said Doug Leslie, Director of Public Works for the City of Cape Girardeau. "We didn't have to scramble around to secure our water supply. We didn't have to sandbag in more than three or four places. We didn't have weeks of cleanup to go through either. I think we had one dump truck full of sandbags this year compared to the hundreds of dump truck loads in the 1993 and 1995 floods."

The sandbags weren't necessary because almost all of the flood-prone homes in Cape Girardeau had been bought out and razed.

"It would've gotten us this year," said Woody Sadler, who lived for 47 years with his wife, Virgie, in Cape Girardeau's floodplain before participating in the buyout program. "A lot of homes and people would've been flooded again. But we weren't there. We got out."

Cape Girardeau, Missouri: Leaving Water Street After 47 Years

Woody and Virgie Sadler moved into their green frame home on the aptly named Water Street in 1949. For years they saw the Mississippi River rise and fall, but it never threatened their home in the floodplain neighborhood of Cape Girardeau, Missouri, known as Red Star.

That changed in the summer of 1993.

"Somebody told me the water was coming," recalls Woody Sadler, a retired laborer and World War II veteran. "I said, 'I know it's flooding, but it won't get here. The highest the water ever gets is up to the front porch of the house across the street.'"

That was in late July. On an early August morning before breakfast, Sadler looked under his four-room house to check for water. Nothing.

"After breakfast I came outside, and there was water 6 inches deep under my house."

Sadler began sandbagging around the house.

"We built a wall of sandbags around it," he recalls. "I put a pump under the house. It never quit running. Pretty soon I had eight pumps going, 24 hours a day."

Woody and Virgie, then 71 and 76 respectively, also put all of their furniture on blocks. "Just in case," said Woody.

Other than the expense of the pumps and the effort involved in sandbagging, the Sadlers were lucky.

They were lucky again in 1995, when the floodwaters returned.

"We got 8 inches of water in the yard," says Woody, who once again created a sandbag barrier around his house. But like others in town, Sadler was growing weary of battling the flood.

"When you get to be my age, you don't want to be fighting those floods," said Sadler. "It's too much stress."

It's hard work, too.

"Taking those sandbags down isn't easy," he said. "When you're putting them in, they're dry and not so heavy. But after they get wet, it's hard work."

"And the snakes," adds Virgie. "That's what I hated. Snakes and slugs and the smell of rotten fish. The odor is unbelievable."

"When you get to be my age, you don't want to be fighting those floods," says Woody Sadler with his wife, Virgie, outside their new home in Cape Girardeau, Missouri.

The Sadlers knew the Mississippi River well enough to know it would continue flooding their Red Star neighborhood.

"It was only a matter of time before we'd get it," said Woody.

Rather than "get it," the Sadlers got out.

In 1997, after 47 years in the green frame house on Water Street, they accepted a buyout offer that Woody Sadler said paid approximately half the price of their current $55,000 home on North Spanish Street, blocks from the floodplain.

"I didn't think about leaving Cape Girardeau," he said. "I love it here. We're really satisfied with this house. It's bigger than our old house. Better, too."

In May 2002, the Mississippi River flooded Cape Girardeau once again.

"I went down and looked at it," says Woody. "Naturally, I'd check."

The floodwaters rolled over the site of the Sadlers' former neighborhood.

"It makes you feel good that you're out of it," said Woody Sadler. "Getting out was one of the best things to ever happen to us."

Neosho, Missouri: From Sandbags to Lawnmowers

How do you turn an eight-acre city park into 175 acres?

Ask Jim Cole, City Manager of Neosho, Missouri (pop. 10,616), which suffered frequent—and very costly—flooding from Hickory Creek.

On average, the floods were causing about $760,000 a year in damage to homes, businesses, and public buildings, and another $95,000 a year in damage to roads and bridges.

"We've gone from buying sandbags to lawnmowers," says Neosho, Missouri, City Manager Jim Cole.

A permanent solution was needed to solve Neosho's chronic flood problem. An answer emerged in the form of a plan. Working in conjunction with the U.S. Department of Agriculture's Natural Resources Conservation Services (NRCS), Neosho devised a watershed plan that involved the creation of dams, retention ponds, and a concrete waterway to direct the runoff.

It was a solution, but a cost-prohibitive one. The most expensive part of the plan was purchasing the 52 residential properties that sat in the path of the proposed waterway.

The historic flood of 1993 provided more heartache to Neosho, but also a glimmer of hope.

It occurred to City Manager Jim Cole that the funding might be available through the Missouri Buyout Program to acquire properties in Neosho's floodplain from willing homeowners and help them relocate to safer neighborhoods.

Cole and key staffers worked all night on the city's buyout proposal they would submit to the State of Missouri, which administers the Missouri Buyout Program.

The efforts paid off. Neosho was awarded $1,386,634 from FEMA, which it combined with funding from HUD's Community Development Block Grant Program. With its buyout funds, Neosho purchased 52 residential properties in the floodplain. Every homeowner in Neosho who was given the opportunity to exchange his or her repetitively flooded home for a check from the city did so.

"They were ready to get out," says Cole, who personally negotiated every acquisition in Neosho.

The buyout was tested in 1995, when Neosho flooded again. This time, the

damage was minimal. Most of the residents had moved out of the hardest hit areas.

Those who remained in harm's way in 1995 suffered additional damage. They, too, were finally ready to get out. However, there was very little buyout funding left.

No problem for Neosho residents, who decided by a 75-percent margin to levy a 3/8th-cent sales tax on themselves to pay for the additional 26 acquisitions and to maintain the newly acquired land, which is now part of Neosho's 175-acre city park.

In May 2002, the floodwaters barely made a ripple in Neosho, now that its floodplain is mainly parkland.

"We've gone from buying sandbags to lawnmowers," said Cole.

With its watershed plan a proven success, Neosho can turn its attention to designing the new park. So far, the plan includes baseball diamonds, hiking trails, a community soccer field, and fishing areas from the banks of Hickory Creek.

"And that's just the beginning," said Cole, with understandable pride.

St. Charles County, Missouri: The Successful Experiment

St. Charles County, Missouri, has a long history of flooding. Situated at the confluence of the Missouri and Mississippi Rivers, the county of almost 300,000 residents suffered perhaps Missouri's worst flood damage in 1993, when more than 2,100 homes were condemned as a result of the disaster.

St. Charles County was hit hard by the floods. But it fought back with the Missouri Buyout Program. Between 1993 and 1995, St. Charles County used $5.78 million in FEMA funding and $8.8 million from the Community Development Block Grant program to acquire 1,159 properties from willing homeowners. "A federal buyout of property in the floodplain has worked wonders," the *St. Louis Post-Dispatch* reported in May 1994.

Nature–and taxpayers–benefited when more than 1,100 flood-prone homes were removed from wetland areas of St. Charles County, Missouri.

When a second major flood occurred in 1995, St. Charles County had an opportunity to test the effectiveness of its buyout program. The results were impressive.

Of the 1,159 properties acquired in 1993-95, St. Charles County Planning Director Steve Lauer estimated that at least 95 percent would have flooded again in 1995.

"These were the places where, year after year, we saw the highest incidence of repetitive loss," Lauer said. "If you look at it over the long term, there's a real cost savings in buying out these places. And there's the peace of mind it gives people. They're really glad to be out."

When Missouri received a Presidential disaster declaration for flooding in May 2002, St. Charles County, the worst-hit county in the 1993 flood, was not included in the disaster declaration. The damage was simply not significant enough to justify it.

"The flooding wasn't as bad as in '93," explains Lauer. "That makes a difference, of course. But what really helps is that the flooding occurred along the rivers, where we've bought out a lot of homes. The people who didn't participate in the buyout have elevated their homes. So it's a combination of buyouts and elevations."

St. Charles County transferred much of the buyout land to the City of St. Charles to use as park and recreational areas. Other parcels have been leased for garden spots.

Perhaps the most creative use of the St. Charles buyout land is the outdoor classroom at Lindenwood University. "It's been wonderful for the students," said Professor Daryl Anderson, who teaches biology and oversees the seven-acre classroom where flooded cabins once floated.

"These are true wetlands and ideal for students who ultimately want to work for the EPA or as park rangers or be involved in fish and wildlife preservation," said Anderson. "We've had a chance to do all kinds of outdoor biology. The students take soil samples from the marsh. They observe in a way that teaches biological techniques. Some of these kids are becoming experts in migratory birds and frogs and plants. They're not just learning *about* science. They're *learning science*, which is a methodical way of thinking and doing things."

Likewise, the Missouri Buyout Program was methodical. It offered homeowners in the floodplain a practical way to move out of harm's way. It further spared them the heartache of having to live though another flood. It also saved taxpayer dollars that would have been necessary to bail out repetitive-loss homeowners after another flood.

St. Mary, Missouri: Making Flood Damage a Thing of the Past

In recent years, tiny St. Mary, Missouri (pop. 377), attempted to use its antique mall and quaint Main Street to lure visitors to this Mississippi River town in St. Genevieve County.

However, St. Mary was becoming better known for its chronic floods than for its antiques.

The problem was a five-acre parcel of land on the city's southern edge, where the St. Lawrence Creek and the Regular Slough flooded frequently, damaging a handful of homes.

Many homeowners in the area accepted the repetitive flooding—and the repetitive checks for federal assistance—but only because moving to higher ground was financially impractical.

"We knew which houses to buy," says St. Mary, Missouri, City Clerk JoAnn Donze.

The floodwaters that overtook St. Mary in 1993 were more severe. They stayed for a month, damaging every structure outside the makeshift levee built by residents to save Main Street.

After the waters receded, city officials aggressively pursued federal and state funding to buy out the homes that sat in the city's 100-year floodplain and move the residents to higher, safer ground.

With $93,390 in funding from the Missouri Buyout Program and $237,785 from the Missouri Department of Economic Development, the City of St. Mary purchased 36 homes and helped their owners relocate.

The success of the buyout was evident in 1995, when floodwaters returned to St. Mary. All but four families had moved out of the flooded area, and damage was minimal.

In May 2002, when St. Mary flooded again, no one seemed to mind. "When it comes to buyouts of flooded residential property, Missouri is well in front of the pack of flood-ravaged states," reported the *Jefferson City News Tribune*.

"Nobody had water in their homes this time," said St. Mary City Clerk JoAnn Donze. "Two people had water in their yards, but nobody had flood damage to their house."

The success of the St. Mary buyout underscores the wisdom of letting local communities oversee such projects.

"We knew which houses to buy," explains Donze. "We knew the homes that flooded time after time."

According to JoAnn Donze, residents in St. Mary were eager for the buyout.

“People were ready to leave their homes,” Donze says. “A lot of them had been flooded so many times. They didn’t want to go back to that.”

But they didn’t want to leave St. Mary, either. “We got government funding to help build new neighborhoods and bring back businesses,” says Donze. “So now we have younger families and more businesses.”

And, today, locals can spend more time shopping for antiques and less time trying to save their own treasures from floodwaters.

Special Feature

Hazard Mitigation: The Cornerstone of Emergency Management

A Tale of Two Flood-Prepared Iowa Communities

Hazard mitigation is sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. Mitigation is the cornerstone of emergency management. It's the ongoing effort to lessen the impact disasters have on people and property. Mitigation involves keeping homes away from floodplains, engineering bridges to withstand earthquakes, creating and enforcing effective building codes to protect property from windstorms—and more.

Hazard mitigation programs have been put to the test in nine or more Midwest states since the massive floods of 1993. Thousands of buildings have been cleared from the floodplain since mitigation efforts were stepped up in the area. In Iowa, one of the states heavily hit in 1993, FEMA's hazard mitigation offer was readily accepted, setting in motion one of the most ambitious floodplain acquisition programs in the nation.

"We've been very aggressive in pursuing these hazard mitigation programs," said John Miller, former director of FEMA Region VII, which includes Iowa. "We are beginning to see the results of our efforts. The avoided damages from the recent May and July floods will be millions of dollars. These programs are paying off."

The Mitigation Payoff

Since the 1993 floods, Iowa has begun more than 46 acquisition or relocation projects, according to Dennis Harper, the State of Iowa hazard mitigation officer. Some 1,000 properties have been removed from flood-hazard areas in the state. More than 20 critical facilities, such as hospitals, have been protected. At least 66 projects have been funded, with a total investment of $54 million in FEMA, state, and local community funds. The long-term payoff is 2 dollars returned for every 1 dollar invested, Harper says. In some communities the payoff is already greater.

In the spring and summer of 1999, Iowa was again inundated by heavy rains. Two federal disasters were declared. In May, 16 counties were declared for tornadoes and floods. In July, 21 counties were declared for severe storms and floods again.

With flood-hazard mitigation help from FEMA, Iowa experiences far fewer scenes like this.

Many of the same counties were declared in both disasters. Fortunately, eight of the declared counties had elected to participate in a hazard mitigation buyout program after the 1993 floods. In these eight counties, 271 families who had been affected by the 1993 floods were spared the trauma and loss of repeat flooding because they no longer lived in the floodplain.

Among the declared counties, Black Hawk and Buchanan were declared disaster areas in both events. In these counties, two

cities—Cedar Falls in Black Hawk, on the Cedar River, and Independence in Buchanan, on the Wapsipinicon River—had actively pursued participation in the buyout program. Their stories follow.

Cedar Falls

Cedar Falls is a quiet residential community of 34,000 people in Black Hawk County. In a more heavily populated area, it would be considered suburban in the true American sense. The University of Northern Iowa, a state college with an enrollment of 13,000 students, is the city's largest employer. Some residents work in local light industry. Others commute to nearby Waterloo, many to work in the John Deere tractor factory, the largest tractor factory in the world. Locals, however, consider Cedar Falls a "college town."

Wide streets, lined with old-growth maple, oak, and walnut trees shading grand Victorian homes, traverse a gently sloping hill and wander through a flourishing downtown business area, which abuts the Cedar River. North of the downtown area, across the river, in a low-lying area along the north bank and in the floodplain, is the "Cedar City" neighborhood, an area of single-family houses, mobile homes, and industrial buildings.

At the City of Cedar Falls, the river has crested above flood stage 94 times or more since 1929. When the water flows, it flows onto Cedar City. Since 1990, Black Hawk County, including Cedar Falls, has had six federally declared disasters for floods.

After contending with back-to-back floods in the spring and summer of 1993, the city decided to take action to break the constant cycle of flooding, rebuilding, and flooding again. Cedar Falls applied for assistance in buying out homes in the frequently flooded Cedar City area.

Flood-protection buyout projects are developed at the local level and submitted to the state for approval under FEMA's Hazard Mitigation Grant Program (HMGP) and HUD's Community Development Block Grant (CDBG) program.

The buyouts began in December 1993. By the time this program was completed in September 1997, the city had purchased 99 properties. Ninety-eight homes and one lot were purchased. Ninety-six of the homes were demolished. Two were moved to higher land. In all, 89 families were moved to safety from the floodplain.

The first 12 properties were purchased with CDBG grants. The other 87 were purchased with money from FEMA HMGP grants (75 percent) and state and local community financing (25 percent) assisted by CDBG grants. The total cost of the program was $4,330,000. This expense includes appraisals, acquisition, closing and legal costs, relocation assistance, and demolition. Of the 89 families relocated, 46 found replacement housing in Cedar Falls, 18 relocated to nearby Waterloo, and 25 moved to other areas of Iowa. Local officials say there was little loss to business or the tax base.

The State of Iowa projects the 30-year benefit from this project to be more than $6.6 million in avoided damages. Since the beginning of the project in 1993, $872,022 in damages has been avoided. Estimated avoided damage from the recent May and July floods is $4,472,333. The total avoided damage for these events is $5,344,355, which exceeds the cost of the hazard mitigation project by more than $1 million.

All acquired properties are deed restricted and must remain in public ownership permanently. The Cedar City property will be saved as green space. Parks will be built,

bike trails laid out, and possibly a campground built. All will be connected to existing parkland in the area.

Marty Ryan is the City Planner in Cedar Falls. When asked if the city has any further plans for buyouts, Ryan replied, "After the July floods this year, we sent a survey to the 125 remaining residents in Cedar City. Almost immediately, we received 78 answers, all wanting to be bought out. We will begin the next phase as soon as we have funds."

How do the people in town feel about the buyouts? Barb Hugi, the city planner who handled the buyouts in 1993 says, "I've never run into any person who was not happy to be moved from that area."

Sandy Albert and her husband Brian moved the house she grew up in. They had bought it from her mother 3 months before the April 1993 flood. She was attached to the house and did not want to see it demolished.

"It's the best thing I've ever done," Sandy said while sitting on the sundeck of her relocated house less than 2 miles from Cedar City. "My house is adding value now rather than subtracting value. I would highly advise anyone still there to get out."

Independence

Independence, Iowa (pop. 6,000), is a classic Midwest farm community. The towering grain elevators of the local co-op, the Buchanan County Fair grounds, the ubiquitous Wal-Mart, and a neighborhood of well-kept, single-family homes frame the downtown area. Corn and soybeans grow right up to the edge of downtown. Independence is the Buchanan County seat and center of this agricultural county's business community.

The city is divided east-west by the Wapsipinicon River and north-south by First Street, its main street. The low-lying area in the northwest section of the downtown, boarded by the "Wapsi," as local folks call

Sandy Albert, with her daughters and their friends, spends a sunny day at her relocated Cedar Falls, Iowa, home. (FEMA Photo: Kevin Galvin)

the river, and First Street, is a residential area. This area is in the floodplain and has been a constant flood pain for the city.

The City of Independence, Iowa, was declared a federal disaster area three times in the 1990s.

From 1968 to July of 1999, the Wapsi has overflowed its banks at least 11 times, wreaking havoc on the homes in this northwest neighborhood. Three of these flood events were declared federal disasters: one in 1993, two in 1999. In the May floods of this year, 328 homes were flooded again. In the July floods, the number was 186.

After the Midwest floods of 1993, the City of Independence decided it could no longer live with the constant flood-rebuild-flood cycle, which was a severe drain on local resources. The city applied for assistance in buying out homes in the frequently flooded northwest neighborhood along the river.

As was the case in Cedar Falls, the flood-protection buyout project in Independence was developed at the local level and submitted to the state for approval under FEMA's HMGP and HUD's CDBG program.

The State of Iowa approved Independence's buyout plan in short order.

The buyouts began in 1993 and were completed in 1994. Twenty-eight families were moved from the floodplain. Twenty-six of the houses were demolished, and two were moved to higher, dryer ground. Most of the families stayed in the city. There was negligible loss to community businesses or the tax base. No businesses had to be relocated.

The buyouts were funded with FEMA HMGP grants (75 percent) and state and local community financing assisted by CDBG funds. The total cost of the program was $754,295. This expense includes appraisals, acquisition, closing and legal costs, relocation assistance, and demolition.

The State of Iowa projected the 30-year benefit from this project to be a little more than $800,000 in avoided damages. Since the beginning of the project in 1993, more than $2 million in damages has been avoided. Estimated avoided damage from the recent May and July floods alone is $1,869,028. Savings to date are 2.5 times the original estimate.

All of the acquired properties are deed restricted and must remain in public ownership permanently. They will be converted to green space. "Teachers Park" will be built along the Wapsi with baseball, football, and soccer fields. The John Deere plant in nearby Waterloo is donating EPA-approved foundry sand to raise the elevation and level the playing fields. This approach is a win-win situation for the city, alleviating a constant drain on precious emergency resources and creating an attractive park in the downtown area.

Greg Knott is the Building Official, Zoning Administrator, and Floodplain Manager in Independence. He has applied to the state for

funds to buy out 50-65 more homes. When asked how the people of Independence feel about mitigation now, he replies, "Not all of the people were concerned after the May flood. After the second flood this year, the July flood, everybody is in favor of mitigation. They just wish it would hurry up."

"Historically we're going to get more floods on the Wapsipinicon. That's a gimme. If we can move 65 more homes out of there, that's 65 more families who are not going to be in danger again," said Knott. "That's the whole process of mitigation. Not only that, it's going to relieve the disaster funds required to give them assistance in the future. It's a good investment because you're operating against something that's going to happen."

Conclusion

The recent unfortunate flooding in Iowa shows the importance of the hazard mitigation. The same cities and towns in the same counties have been flooded again and again.

The avoided damages in Cedar Falls and Independence in 1999 have proven the value of the buyout investment. More than $7 million in potential savings has been realized in these two cities alone.

"We cannot continue to pump money into areas that are repeatedly flooded," said FEMA's Miller. "We have seen from these two examples how effective buyouts can be. We must convince other communities to commit to hazard mitigation programs to insure the safety of their citizens and reduce future disaster losses."

Special Feature

Illinois, Iowa, Kansas, and Missouri Insurance Success Stories

Where the Eagles Fly

Grafton, Illinois, is one of the prettiest places you'll find in the Midwest. The old section of town lies where the Mississippi and Illinois Rivers meet, about 50 miles upstream from the St. Louis Gateway Arch. Grafton was founded in 1836, and you'll still see paddlewheel riverboats and ferries cutting across the rivers.

Grafton is also renowned for a number of things—for its morel mushrooms and as the winter home of the American Bald Eagle. Some would argue, too, that Grafton is a "must-see" venue on one of the most scenic drives in the United States, along Route 100 between Alton, Illinois, and Pere Marquette State Park.

There's a great deal in Grafton to be justifiably proud of—the people, the place, the history. But part of Grafton's history also involves frequent flooding.

"With floods and Grafton, it's not a question of *if*," says Richard Mosby, Mayor of Grafton and owner of Mosby's Woodwork. "It's really a question of *when*. So everyone needs to be protected."

True to his own advice, in 1993, Mosby did everything in his power to protect his business from flood damage. Mosby's Woodwork on East Main Street lies just at the edge of the Mississippi River, so when the river rises he takes extra precautions.

With each revised estimate of the flood stage that summer, Mosby would raise his equipment and inventory higher. Finally, he had everything on 6-foot-high platforms, thinking that that would be high enough. In addition to sandbagging and elevating his contents, he also had flood insurance under the National Flood Insurance Program (NFIP).

By July 1993, flood stages along the Mississippi and the Illinois went to record levels and finally flooded Grafton. The depth of the floodwater inside Mosby's Woodwork was 10 feet, just 2 feet below the roof.

"I lost close to $180,000 in building and contents from the flood," Mosby recalls.

One consolation, though, was that Mosby's lender had required him to carry $80,000 worth of flood insurance. This helped, although Mosby now wishes he had carried more flood insurance protection that summer. But Mosby also rolled up his sleeves and rebuilt his business and helped rebuild his community, too.

After the 1993 flood, Grafton became a mitigation success story. Seventy houses and 18 commercial buildings were bought and removed from Grafton's floodplain, at a cost of $2,320,980 in FEMA's Hazard Mitigation Grant Program funds and $773,636 in matching funds from the Illinois Department of Commerce and Community Affairs.

So some things in Grafton have changed for the better since 1993. The bluff overlooking the old town now has a new subdivision out of the reach of floodwaters. The old section of Grafton has a new face for some of its businesses, without losing any of its charm, and a number of homes at the riverside have been elevated above the reach of the floodwaters. But some things have remained the same since 1993.

Richard Mosby still lives in a hollow that comes alive each spring with dogwoods; the bald eagles still come home to winter in Grafton; and Mosby still carries NFIP flood insurance on his business—both the building and the contents. And the advice Mosby offers, for everyone living in a floodplain, is the same regardless of whether their bank requires them to carry flood insurance: "Go get flood insurance."

We think that advice makes sense coming from both a business owner and community official who lived through one of the worst floods in the nation's history, only to make his community stronger and safer.

Red House on the Wapsi

Bob and Joni Hocken don't plan to let the muddy waters of the Wapsipinicon River drive them from their Independence, Iowa, home again.

Twice in 1999—first in May and later in July—the "Wapsi," as the river is known locally, flooded the Hockens' red-painted, 100-year-old home. Both were traumatic experiences, Joni Hocken said, but the May flooding was worse. Spring planting had just taken place, so the river brought with it large quantities of mud and silt and had an odor she'll never forget.

"You need a positive attitude to make it through something like this." (Photo: Bob and Joni Hocken)

At its highest, the brown water flooded the first floor to a depth of 46 inches, soaking carpeting, furniture, and personal items. Even food, stacked on the kitchen counter, and thought by Bob and Joni to be out of harm's way, got wet and was ruined.

They'd just managed to mop up that damage when the river flooded again 2 months later, although not quite as bad as it did in May. "You need a positive attitude to make it through something like this," Joni said.

Bob and Joni, both Iowa natives, thought about taking advantage of a city buyout backed up by funding from the Federal Emergency Management Agency (FEMA) and the State of Iowa.

Buyouts in Independence began in 1993. Thus far, 28 families have accepted buyouts and moved out of the floodplain. However, a severe housing shortage forced many of them to move away from town. The Hockens wanted to stay in Independence.

Independence, a town of 6,000 residents and the county seat of Buchanan County, was settled in 1847. Its vibrant downtown is surrounded by large single-family homes with big lawns and old trees. The Wapsipinicon Mill, severely damaged by flooding in 1999, dominates the west end of First Street.

The Wapsi has repeatedly devastated this community. Between 1968 and 1999, it flowed out of its banks 11 times. After the Midwest flood of 1993, the community decided enough was enough. Repeated flooding was becoming a severe drain on resources, so the community agreed to

Joni Hocken said she and her husband, Bob, decided their Independence, Iowa, home had too many memories, such as this door frame that recorded the heights of children and grandchildren, to sell after the floods of 1999. Instead, they elevated their home out of the floodplain. (Photo: David Teska, FEMA)

At first, said Joni Hocken, their Independence, Iowa, neighbors were puzzled by the spectacle of their 100-year-old, two-story, red-painted home being elevated on new concrete foundation walls. (Photo: Mike McCoy, FEMA)

participate in a buyout program under FEMA's Hazard Mitigation Grant Program, as provided under the guidelines of the Robert T. Stafford Disaster Assistance and Emergency Relief Act. This program provided additional federal funds to the State of Iowa to fund community projects to lessen or mitigate damage from future disasters.

Because the Hockens' home sustained substantial damage, defined as more than 50 percent of its market value, they qualified for an additional flood insurance benefit. This benefit is spelled out in a provision of the National Flood Insurance Program (NFIP) flood insurance policy called Increased Cost of Compliance (ICC) coverage.

Under ICC, NFIP-insured property owners may qualify for an additional payment of up to $20,000 to bring their flood-damaged buildings into compliance with local floodplain laws and ordinances. [Effective May 1, 2003, the ICC coverage limit was increased to $30,000.] In the Hockens' case, their home was elevated with a combination of funds—a regular NFIP flood insurance claim payment, an ICC payment, and their own money.

In the end, Bob and Joni couldn't bring themselves to sell their home of 27 years.

They had raised their two children, Robbie and Kelley, in that home and their three grandchildren are often about the place. Dates, names, and height marks on a door frame provide a visible link between the house and the Hocken family.

Once they decided moving wasn't an option, Bob and Joni decided to take the radical step of elevating their home out of the floodplain. To further protect it, they moved it 50 feet from the street and 50 feet back from the bank of the Wapsi.

At first, Joni said, neighbors were puzzled by the spectacle of a two-story home being

elevated on new concrete foundation walls. "I had people saying, 'You don't want to raise that house,'" she recalls.

Their experience with the flooding of the Wapsi has taught the Hockens what it means to live near a flood-prone river. Bob laid out the home's new first floor (the original first floor is now at the second-story level) in such a way that, when the river floods again, the water will simply flow out when the level drops. "The next time it floods the clean-up will cost about $100," Bob said.

To cut costs and maintain control of the project, Bob recommends that anyone contemplating such a project act as his own contractor. He's kept control of the project from the start and held costs down. The final bill, including the $6,500 it took to raise the home, will come to about $60,000, according to Hocken—far less than building or buying elsewhere. They also decided to make the house handicapped accessible to enhance its resale value.

The Hockens further reduced costs by tapping into family resources such as Joni's uncle, who is a carpenter.

Living close to the Wapsi and having experienced three floods in the 1990s taught the Hockens the value of flood insurance. Joni said that homeowners in a floodplain should consider NFIP flood insurance, which covers the structure and its contents.

These days, Bob and Joni Hocken can talk philosophically about their experiences with the Wapsi. They know what it's like to live next to a river that, on most days, flows serenely past their home but can quickly become tempestuous and threatening. Rather than move away, certainly an option for some, the Hockens decided to stay and make the necessary changes to their home so that they are prepared when the Wapsi rages again. They know they can't tame nature. What they can do and have done is use the knowledge gained from the past so that they aren't flooded out of their home the next time.

Bob and Joni Hocken decided that selling their Independence, Iowa, home of 27 years wasn't an option, even after it flooded twice in 1999. Instead, they elevated the home, seen in the background, so that the living areas are now well above the floodplain. (Photo: David Teska, FEMA)

"You live here; you have to expect it," Joni Hocken said.

Learning a Lesson . . . the Hard Way

In the torrential downpour of October 4, 1998, Doug Lytle, owner of Olympic Cabinet Company, and his father, Bill, stood high on a bridge embankment overlooking their businesses on Southwest Boulevard in Kansas City, Kansas.

Doug's 13,000-square-foot cabinet fabrication shop was right on the banks of the overflowing Turkey Creek. "A wall of water 8 feet high" as he later described it, came barreling down from nearby railroad yards. The water slammed into the back wall of his building, caving in a 25-foot section. It continued inside, rushing through the shop and out the front overhead garage doors.

The wall of water carried off tools, equipment, and projects-in-progress for clients. It also swept away irreplaceable memorabilia of his pole vaulting performances at the 1984 U.S. Olympic summer games.

In a heartbeat, Doug Lytle's business was a ravaged, soaking mess. And an important piece of his life was washed away forever. And, as he later found out, he didn't have insurance to cover the losses.

Doug wasn't the only one in the family who suffered. Bill Lytle's office building stands on the same road but about a block "downstream" from his son's cabinet shop. The October 4 storm wasn't kind to him, either. Bill's two-story building was filled with more than 4 feet of water.

Bill was no stranger to flooding. His building got about 2½ feet of water during the Midwest flood of 1993. The difference, he says, was that in 1993, the water came up more slowly. This year's storm was a different story. The water was fierce and fast. A 6-foot-tall privacy fence buckled and disappeared. Two storage sheds were washed away. His parking lot rippled and heaved. Only the building remained.

Now, for the second time, Bill Lytle's losses—contents and damage to his building—were covered by a National Flood Insurance Program (NFIP) flood insurance policy.

"Had to buy flood insurance to finance the building when I bought it in 1988," he said. "In 1993, the flood insurance agent was on the spot within four days. FEMA was here quick and paid quick," he said confidently.

For Doug, the story wasn't so good. He wasn't covered by flood insurance. When he changed insurance agents a few years back, the flood insurance coverage he had "somehow got dropped." He never knew it until it was too late.

"I've probably lost a quarter of a million dollars," he said ruefully about the October storm and its effect on his business. "I'm probably the largest employer in this quadrant, and I was shut down for a month," he said. More than a month after the flood, part of the operation still was shut down.

Both buildings are located in a well-known floodplain. Southwest Boulevard often takes on water during a heavy rain, the Lytles say. Still, there are distinct advantages to being there. The Boulevard is right along I-35, with easy access to Kansas City's southern suburbs, where many of Doug's customers are building.

"We wouldn't want to sell out," Doug commented. "We've been on this boulevard for 12 or 13 years. The Boulevard is a really good area for business. It's an industrialized area and all our major suppliers are close by."

So, Doug is taking steps to protect his future and his business from the next inevitable flood. He's purchased flood insurance from the NFIP and is taking out low-interest disaster loans from the U.S. Small Business Administration to clean up, repair, and rebuild. He's reinforcing the floors, raising the heating and air conditioning units, and possibly building a retaining wall.

"I'm almost through the 30-day waiting period for my flood insurance policy to go into effect," he said, eyeing the blue November sky. He believes his business will be better protected the next time.

The lessons Doug learned from that October storm haven't stopped at the doors of his business. Although his home wasn't damaged this time, he knows of others who live outside of floodplains and who still got as much as 2 feet of water inside. In fact, he knows of a lot of places that took on water in that storm for the first time ever.

"Floodplains seem to change," he said wryly.

With that in mind, he's getting flood insurance for his house, too.

My Loan Man Made Me Do It

Les Wheatley hadn't really thought much about it. He had been a good businessman all his life. But when he was applying for a loan to expand Dotty's Quilt Shop, Wheatley's lender insisted that he buy flood insurance.

It seemed like just one more thing at the time.

Today he says, "Thank God, my loan man made me buy it. It kept me in business."

It was the afternoon of July 30, 1993. Les, his daughter, and her husband had heard the warnings earlier that day, as everyone else had in Chesterfield, Missouri. For 6 hours, they piled sandbags around Dotty's.

They also did another smart thing and rented a truck, the last one available from the rental place down the street. They loaded it up with as much as they could from Dotty's—sewing machines, fabric, records—and moved to high ground.

Late that night, the levee blew, and the Missouri River rushed past Dotty's on both sides, only to back up and fill the place with floodwater that almost reached the 15-foot-high ceiling.

"It was just like filling up a bathtub," Wheatley recalls. "Some people around here called the city 'Lake Chesterfield.'"

The water stayed high for 3 weeks in and around Dotty's. Finally when it receded, Les and his family took stock and started the grueling job of cleanup.

Les got back on his feet thanks to hard work, the support of his family, lots of friends, and his National Flood Insurance Program flood insurance claim payment.

Dotty's was one of 65 businesses in Chesterfield, Missouri, able to start back up again. Close to 200 others in Chesterfield never did. Many of the failed businesses didn't have what Les Wheatley had: flood coverage.

Now, it's 10 years later. Les Wheatley has sold his business and retired. But he'll never forget that day in 1993 when the Missouri River swept away so many people's dreams.

And if anyone wants to go into business, Les has two pieces of advice: keep good books and "you'd better have flood insurance."

We think that advice is rock-solid, especially from one who was a little reluctant to buy flood insurance in the first place.

Computer Oatmeal

From his seat in the small airplane circling at 12,000 feet above the watery disaster scene on the ground, Steve Rouff couldn't make out the exact location of International Marketing Group, Inc. (IMG), one of more than 200 businesses in Chesterfield, Missouri, submerged by the 1993 flood. As far as the eye could see, it looked like one vast, muddy lake.

While Rouff dreaded the grueling cleanup ahead of him, he did have the comfort of knowing IMG was protected, at least financially.

"I've lived in the St. Louis area most of my adult life, so floods are no stranger to me," said Rouff. "But I bought flood insurance largely on the advice of my insurance agent. Now, I can't thank him enough."

For about 3 weeks, Rouff couldn't even get back into his business to assess the damage. Perched on telephone poles, the egrets and water birds seemed to be waiting, as well, to reclaim the place for themselves.

When Rouff could finally assess the damage, he saw what he now refers to as "computer oatmeal." Nothing was left. But because of some careful planning and some quick thinking, he and his "team" (that's how he refers to his employees) were able to save the business.

Ten years after the Great Midwest Flood of 1993, Steve Rouff reflects on what helped IMG, Inc., stay afloat when almost two-thirds of the businesses in Chesterfield never recovered.

"We survived because we had four things going for us."

First of all, IMG, Inc., had backed up all of its computer and record systems at another location. This is a business practice that emergency managers, bank regulators, and a number of corporations have been urging for years.

Second, Rouff and his team had developed a disaster recovery plan that they had walked through—each knowing what to do and when to do it in case of an emergency.

Third, they had removed IMG, Inc.'s, servers from the Chesterfield Valley Industrial Park when they got the first warning.

Last, but certainly not least, Steve Rouff had the protection of his National Flood Insurance Program (NFIP) flood insurance policy.

To this day, Rouff is proud that his team's planning paid off: International Marketing Group, Inc., suffered no business interruption after the 1993 flood, and they were able to provide seamless service to their customers.

This is what planning did for IMG, Inc.: On Friday, July 30, the day of the flood, IMG removed vital servers to a safe location. On Saturday, suppliers were rerouting orders. On Sunday, August 1, 20 single phone lines were dropped at IMG's new site. On Monday morning, they were taking orders from their customers. And on Tuesday, August 3, those orders were being shipped.

For the long-term, however, IMG was able to recover because Steve Rouff had bought flood insurance.

"I would have bought more if I could have." (There is a $500,000 statutory limit on NFIP flood insurance protection for nonresidential contents, such as business inventory, equipment, and furnishings.)

Steve Rouff's only regret today is that he lost some irreplaceable treasures in the 1993 flood: a cherished picture of his wife, and the crafts his then 8-year-old had made just for him.

The egrets and Steve Rouff are no longer in Chesterfield.

But his business survived. And, according to Rouff, this is a large part of the reason: "If you're going to live or work in a floodplain, you need flood insurance . . . and maybe a boat."

FEMA Region VIII

The Langdon, North Dakota, Success Story

FEMA Region VIII serves Colorado, Montana, North Dakota,
South Dakota, Utah, and Wyoming.
For contact information, see the FEMA Regional Offices list on pages vii-viii.

Hazard Mitigation Grant Program
Diversion Project in Langdon, North Dakota

After the 1993 flood, the City of Langdon, North Dakota, installed a new diversion channel to handle excessive storm runoff and flooding. The community received almost $82,500 in federal funds under FEMA's Hazard Mitigation Grant Program to help pay for this $110, 000 project. The diversion project now enables floodwaters to flow around the city through a series of channels.

That was not the case during the 1993 Midwest flood. Water was flowing through Langdon at an estimated 80-90 cubic feet per second. Water levels in Langdon increased rapidly with nowhere for any of the excess water to drain.

The 1993 flood caused more than $700,000 in damages for this small community. The excess water infiltrated Langdon's sanitary sewer system and posed a threat to public health and safety. The flooding also impacted the city water reservoirs, the city lift station, and numerous residences.

The diversion project gave an early return to Langdon on this investment in mitigation. During a spring flood of 1997, the water flowed through the diversion channel at an estimated rate of nearly 150 cubic feet per second—close to double the rate of the 1993 flood. Langdon residents reported no damage from the 1997 flood, one of the most damaging in North Dakota's history.

If the diversion project had not been completed, the City of Langdon estimates, damages would have exceeded $1 million. In Langdon, flood hazard mitigation has paid off handsomely: $82,500 in federal mitigation funds "bought" the city $1 million in avoided flood damages.

The residents of Langdon, however, are the main beneficiaries of this mitigation project. They are safer from the effects of spring flooding. Their sanitary sewer system is protected from flooding, and the residents have a safer and healthier environment to live in.

For additional mitigation success stories, see Journeys: North Dakota's Trail Towards Disaster Resistance*, prepared and issued by FEMA Region VIII and the North Dakota Division of Emergency Management, January 2001.* Journeys *reflects mitigation successes after the 1997 Upper Midwest flood.*

Association of State Floodplain Managers

Excerpts from

Mitigation Success Stories

Edition 4, January 2000

The Association of State Floodplain Managers (ASFPM) is an organization of professionals involved in floodplain management, flood hazard mitigation, the National Flood Insurance Program, and flood preparedness, warning, and recovery. For information, visit ASFPM's web site (http://www.floods.org).

Petersburg, Illinois

Location: Petersburg, Illinois
Project: PORTA High School Community Problem-Solving (CmPS) Team
Technique(s): Open Space Creation and Preservation
Contact: Mary Mies, PORTA High School CmPS Team Sponsor and Coach, mmies@roe38.kk12.il.us or 217-632-3216

Background

When the settlers built Petersburg, Illinois, they chose a site on the banks of the Sangamon River. However, the river's flooding often plagued the oldest part of Petersburg. Families living there suffered declining property values and an overall degeneration of the area. The city could not squeeze enough money from an already strained budget to contain the flooding. After devastating floods in 1979, 1981, 1983, 1990, and 1993, the city sought outside help. Petersburg applied for and received federal funds from FEMA HMGP.

The Hazard Mitigation Project enabled the city to acquire and remove residences and other structures located in the designated floodplain in preparation for project development. The City Council was delighted when the PORTA High School Community Problem-Solving (CmPS) Team expressed an interest in seeking permission to design a reuse plan for a portion of the property after the acquisition program was completed. For each aspect of the project, the team carefully considered all appropriate floodplain uses and incorporated designs that would withstand occasional flooding. The greatest hindrance was that the team had little money to work with. The daunting question was how to raise enough funds to do anything significant with the land?

Project Description

In two lots, the CmPS Team planted flower gardens containing landscaped beds of perennials, installed paths of water-resistant brick paving stones, and added accents such as a flagpole, birdbath/fountain, ornamental trees, and rustic benches. Natural plantings of hedge roses, which grow to 6 feet at maturity, define park boundaries.

Three other lots were designed as preschool playgrounds. Selection of playground equipment reflected the results from polls of elementary school students' favorite play equipment.

Fund raising activities produced more than $15,000 and included the "Decorate an Abe" contest in honor of former Petersburg resident Abraham Lincoln. Area businesses sponsored and decorated silhouettes of Lincoln, and passers-by used their spare change to vote for their favorites. The "Abes" were later auctioned off to raise additional funds.

Sponsorships by civic groups and donations from private citizens also helped with the funding. The Illinois Department of Commerce and Community Affairs (DCCA) and the Association of State Floodplain Managers contributed $51,000.

As the project work was implemented, the city council designated additional lots for which the CmPS Team could develop plans for reuse. The team's efforts motivated other groups to become involved in the reuse of floodplain lots. The Petersburg Tree Committee planted a Memorial Grove, and the High School Science Club began a

prairie grass restoration project on lots that adjoined the preschool playground.

Benefits

- Community and neighborhood pride has been restored by reusing an area of town that was devastated by floods. The whole community has benefited by becoming involved in reclaiming and restoring land previously deemed unusable.
- A useful recreation area was created. Neighborhood children can now play in a clean, safe playground.
- Fund-raising efforts and sponsorships stimulated community interest in the park and instilled feelings of personal ownership and pride.
- The reuse efforts have been cited as a "blueprint" for other small towns facing similar problems. The team has presented the project to many state agencies, federal agencies, and associations.
- The CmPS Team has proven that through education, initiative, and persistence, communities can revitalize flood-prone areas. These properties can become a focal point of pride and beauty.
- This project has brought together a community, has restored the integrity of the land, and has created a lasting contribution to Petersburg.

Costs and Funding Sources

Total project cost = $67,000

- DCCA and the Association of State Floodplain Managers funded the shelter, picnic tables, grills, benches, and other amenities of the playground = $51,000
- Local fundraising and private contributions = $16,000

Members of Petersburg, Illinois's, PORTA High School Community Problem-Solving Team helped prepare flower beds for the winter in the new city park—and had a lot of fun in the process.

Beatrice, Nebraska

Location: Beatrice, Nebraska
Project: Beatrice Acquisitions
Technique(s): Acquisition, Bank Stabilization
Contact: Steve McMaster, Nebraska Department of Natural Resources, smcmaster@dnr.state.ne.us or 402-471-3957

Project Description

After major floods on the Big Blue River in 1973 and 1984, the City of Beatrice instituted its own voluntary acquisition project for residential structures. After another flood in 1993, the city continued to acquire flood-prone structures with funding from FEMA's HMGP and FMA Program.

Beatrice was the first community in the nation whose flood mitigation plan received an FMA grant. This funded the acquisition of 12 residential structures in the Big Blue River floodplain.

In Beatrice, Nebraska, repetitive-loss buildings in the floodplain were acquired and demolished by the city. The open space now is home to athletic fields and parks.

To date, Beatrice has almost completed the goal of removing all of the residential structures in the city's regulated floodplain. The majority of the remaining insurable structures are commercial. Of the 16 repetitive-loss structures in the city, 14 have been acquired and demolished. Most of the acquired open space is being used for athletic fields and parks. A hiking and biking path is to be constructed in the future.

Benefits

- No more federal disaster assistance will ever again be paid for these properties.
- Only open space uses compatible with flood storage will be permitted.
- Expenses for flood cleanup and fire department/law enforcement overtime for flood duty and rescue have been reduced.
- Public safety has been increased.
- The natural habitat for wildlife has been expanded and enriched.
- Beneficial wetland acreage has been gained.
- Creation of a natural buffer strip (riparian corridor) has increased water quality.
- Beatrice was selected by FEMA as Nebraska's first Project Impact community.

Costs and Funding Sources

Total cost of the project (including demolition) = $370,000

- FEMA FMA Program funds were first received in 1997 and were used to acquire 12 homes at 75% = $277,500
- City of Beatrice funding at 25% = $92,500

Union, Missouri

Location: Union, Missouri
Project: Single-Family Home Acquisition; Mobile Home Park Acquisition and Assistance
Technique(s): Acquisition, Demolition
Contact: Sheela Amin, Missouri Emergency Management Agency, samin@sema.state.mo.us or 573-526-9116

Background

With both the Mississippi and the Missouri Rivers located within its borders, the State of Missouri is highly susceptible to riverine flooding. The state, however, is also susceptible to flash flooding. In fact, since 1993, 64 of the 88 flood-related deaths in Missouri were caused by flash floods, not riverine floods. In Missouri, flash flooding is a far greater threat to lives and property than riverine flooding.

The City of Union, located just 45 minutes by car from Saint Louis, is the Franklin County seat. It is a peaceful community of 7,757 people. Flooding in Union is usually caused by the Bourbeuse River. In fact, it was several of the normally quiet little streams with names like Flat Creek, Possum Creek, and Fenton Creek that were suddenly transformed into raging torrents of sewer and stormwater runoff when more than 14 inches of rain fell in less than 8 hours in May 2000. This incredible, unexpected discharge formed a destructive wall of water that rudely awakened many of the city's sleeping residents, immediately endangering their lives and damaging or destroying numerous homes, vehicles, and personal belongings.

The State of Missouri received a presidential disaster declaration on May 12, 2000, establishing funding for disaster relief and mitigation activities through FEMA.

Project Description

On May 30, the city submitted an application to Missouri's State Emergency Management Agency (SEMA) to purchase 29 residential structures and five mobile home parks. The value of the initial application was $2,044,340. Due to funding limitations, the application was modified to include only substantially damaged, residential, "stick built" structures located within the "1-percent-chance flood" event area. (The "1-percent-chance flood" is a flood event that has a 1 percent chance of occurring or being exceeded in any given year. The 1-percent-chance flood formerly was referred to as the "100-year flood.")

Residents of mobile home parks were among the people hit hardest when Union, Missouri, was inundated by 14 inches of rain on a single day in May 2000.

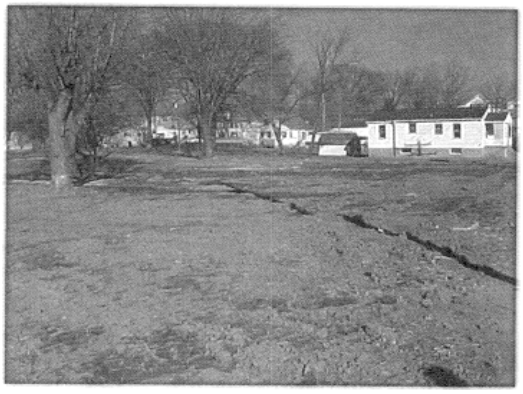
The City of Union ultimately acquired a total of 17 properties. The demolition project was completed on January 18, 2001. As a result of the acquisition program, 17 families are now "out of harm's way." Those 17 properties are deed restricted for

open space, which will prevent future development and the potential for flash flood deaths in that area.

The State of Missouri Community Development Block Grant (CDBG) program was notified by SEMA and the City of Union of the funding shortfall, specifically in regard to the mobile home parks. The May 2000 flood event displaced about 225 people from three mobile home parks. Debris removal costs in the three mobile home parks totaled $241,262. In addition, a majority of the IFG and Disaster Housing payments, which totaled over $722,000, were also provided to the residents of the three mobile home parks. The City of Union applied for and received a grant to acquire the land and financially assist the owners of approximately 58 mobile homes in the three mobile home parks. These mobile home parks will also be deed restricted for open space.

Benefits

- The costs associated with response to and recovery from future flooding in the acquisition areas will no longer exist. This includes approximately $963,262 spent for IFG, Disaster Housing, and PA.
- The flash floods of May 2000 demonstrate the value of disaster and mitigation money invested by the federal, state, and local governments in voluntary flood acquisition programs. When a property is acquired and demolished in an acquisition program and the area is converted to open space for perpetuity, that area may flood again at some time, but people and property simply will not be there to suffer further injuries and damage. In the City of Union, when the next flood event occurs, the damage will be much more limited because many of the homes and people will no longer be in harm's way.



In the floodplain area of the City of Union, Missouri, severely flooded buildings were demolished and cleared to create open space.

Costs and Funding Sources

Single-Family Home Acquisition and Demolition

Total project cost = $926,412

- FEMA HMGP funds for acquisition = $628,336
- State of Missouri General Revenue HMGP funding for acquisition = $209,446 (25% of the matching funds)
- FEMA PA funds used for demolition = $66,472
- State of Missouri General Revenue funding for demolition = $8,863 (10% of the matching funds)
- Local costs for demolition = $13,295 (15% of the matching funds)

Mobile Home Park Acquisition and Assistance

Total project cost = $435,000

- Missouri's CDBG program to acquire the land and financially assist the mobile home owners = $435,000

East St. Peter, Minnesota

Location: East St. Peter, Minnesota
Project: Commercial Buyouts
Technique(s): Acquisition, Relocation, Elevation
Contact: Terri Smith, Minnesota Division of Emergency Management, Terri.Smith@state.mn.us or 651-296-0469

Background

After floodwaters devastated the area around East St. Peter, Minnesota, in the 1960s, the U.S. Army Corps of Engineers constructed a temporary dike in 1969 to protect homes and businesses from flooding. Because the dike was not a permanent structure, no funding was available for maintenance or upgrading. The community needed a permanent solution.

The Minnesota River covered Highway 99 in Le Sueur County in 1993, 1997, and 2001. In each case, the high water caused the closing of the busy roadway that crosses the river and made the bridge from the unincorporated community of East St. Peter to the city of St. Peter impassable. The flood of 1993 caused hundreds of thousands of dollars in property damage and lost revenue.

Repetitive flooding endangers communities at many levels: loss of life, reduction of property values, significant losses in revenue, and stress-related illnesses. These severe consequences push citizens and local officials to action and force difficult decisions.

The concept of FEMA's acquisition program is simple. When homes and businesses have been involved in heavy flooding (especially multiple flooding events), and local officials and owners of these properties are looking for a solution, acquisition can completely eliminate future flooding problems by removal of structures. However, the acquisition process can take years to complete.

Project Description

An acquisition program, initiated after devastating flood damage in 1993, helped 16 East St. Peter business owners and two homeowners move out of the floodplain by the time the 1997 flood hit.

A number of businesses were involved, and various funding agencies participated. Public meetings were held, and subsequently, appraisals and negotiations were conducted on all the properties. Owners were offered a preflood fair market price and additional monies for relocation expenses. Environmental testing took place as required by federal law in the purchase of commercial property. By the next major flood, the acquisitions were complete.

The decision to "get out" was an agonizing one. For some, it was saying good-bye to the livelihoods they had known for 20 to 30 years and a lifetime of customer-based relationships.

The owners of the Whiskey River restaurant and bar, the largest dining establishment in the St. Peter area, chose to remain along Highway 99 and undertook a major rebuilding effort on higher ground.

Cooperating with local, state, and federal agencies, the owners of the Whiskey River elevated their building on fill in compliance with the local floodplain ordinance, greatly reducing the risk of flooding. "We owned the land already. We had been in business

for 15 years and had a good reputation. We checked into other sites in St. Peter and they just didn't have the space," said the owner.

A short-grass prairie now grows where a cement plant, auto body shop, furniture store, and grain elevator once conducted operations. The Le Sueur County Park Committee has responsibility for managing 40 acres that Le Sueur County now holds title to through the acquisition project. Plans for the space include use by community groups for Boy Scout encampments and as a picnic area.

Much of East St. Peter, Minnesota, was under water during the Minnesota River Valley flooding in 2001. (Photo: St. Peter Herald)

Benefits

- During the 1997 and 2001 flood events, there were no damages to residences and businesses along Highway 99 in the East St. Peter area. "Had the houses and businesses still been located in East St. Peter, they would have had 2 to 6 *feet* of water in them," said Darrell Pettis, Le Sueur County Engineer, describing the 2001 flood.
- Removal of commercial structures (e.g., auto body) helps to reduce the risk of surface and groundwater contamination.
- "The river was so powerful, the movement of the water would make the ground shake," said John Zimmerman, a long-time resident. "Today, if the Minnesota River floods, it floods and it's okay."

Costs and Funding Sources

Total project cost = $2,331,000

- FEMA HMGP = $828,000
- Le Sueur County stepped up to be the local-share partner for FEMA's HMGP acquisition project, administered through the Minnesota Division of Emergency Management (DEM) after the presidentially declared disaster of 1993 = $46,000
- The Minnesota Department of Trade and Economic Development (DTED) provided funding for commercial relocation, business reestablishment, environmental studies, and cleanup = $1,182,000
- Minnesota DNR funded = $25,000
  Minnesota DEM funded = $250,000

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Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force. *Sharing the Challenge: Floodplain Management into the 21st Century*, June 1994.

Larson, Lee W. *The Great USA Flood of 1993*. (Monograph presented at the International Association of Hydrological Sciences Conference, Anaheim, CA, June 1996)

Articles

Faber, Scott. "Flood Policy and Management." *River Voices*, Vol. 8, No. 2, Summer 1997.

FEMA Region VII. "Learning a Lesson . . . the Hard Way."

FEMA Region VII. "Red House on the Wapsi."

FEMA Region VIII. "Hazard Mitigation Grant Program Diversion Project in Langdon, North Dakota."

Web Sites

Association of State Floodplain Managers: http://www.floods.org

FEMA Flood Hazard Mitigation Success Stories: http://www.fema.gov/fima/success.shtm

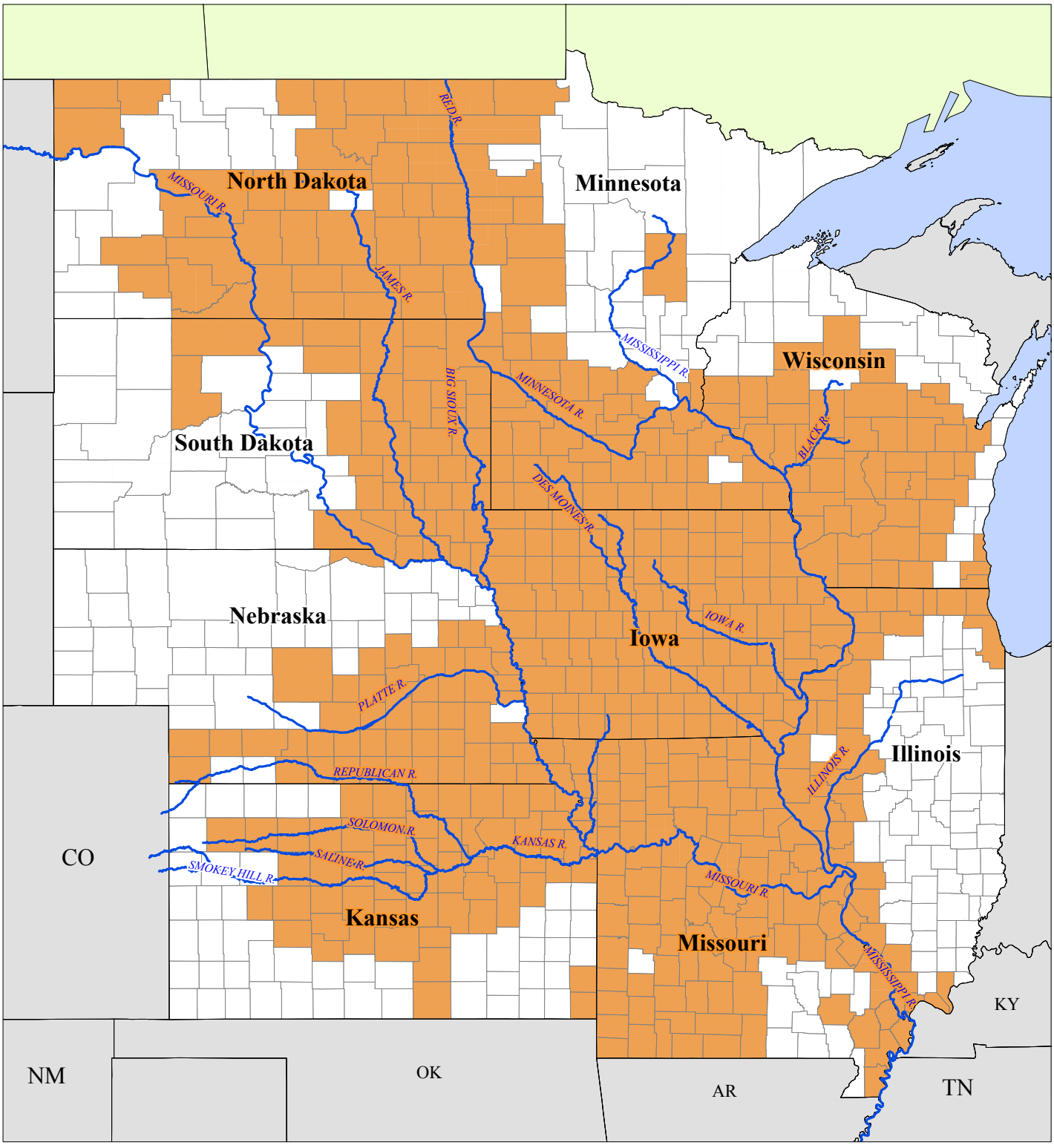
Under "Case Studies," visitors may print a Microsoft Word version or an Adobe PDF version of *Success Stories from the Missouri Buyout Program*, published by FEMA Region VII and the Missouri State Emergency Management Agency.

Under "Regional Resources," visitors will find links to FEMA Region V's *Mitigation Success Stories* and to *Journeys: North Dakota's Trail Towards Disaster Resistance*, published by FEMA Region VIII and the North Dakota Division of Emergency Management.

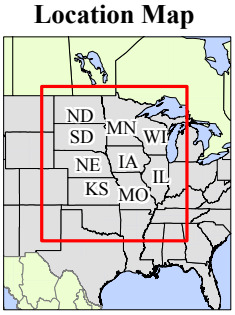
Appendix A

Maps

Declared Counties for the Great Midwest Flood of 1993



Location Map



1993 Great Flood Declared County

Flooding Source

U.S. Department of Homeland Security

FEMA

Mitigation Division
ITS Mapping and Analysis Center
Washington, DC
05/07/2003

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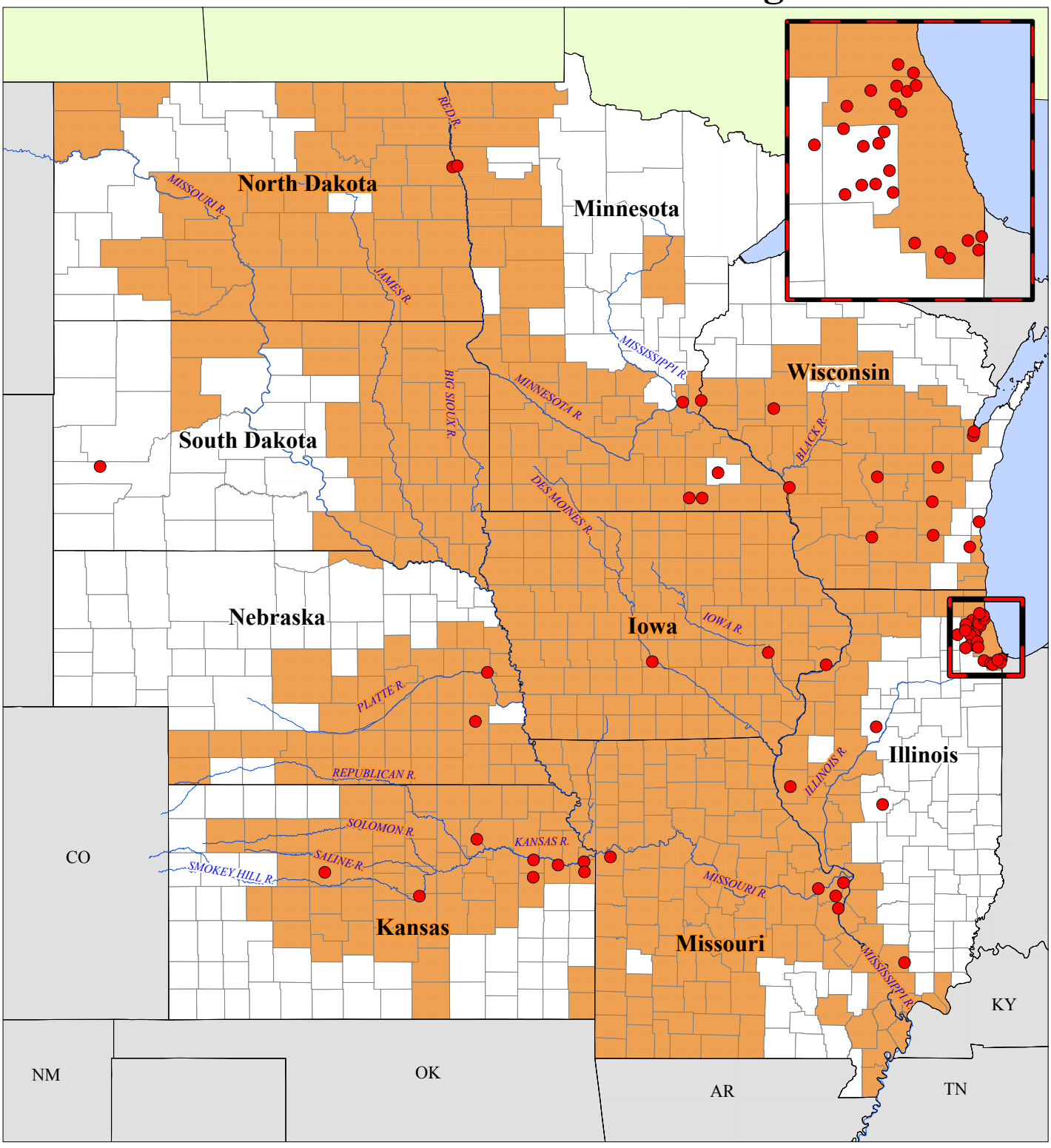
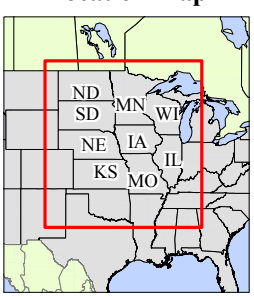
Locations of Current CRS Communities for the 1993 Midwest Flood Region



Location Map



CRS Community

1993 Great Flood Declared County

Flooding Source

U.S. Department of Homeland Security

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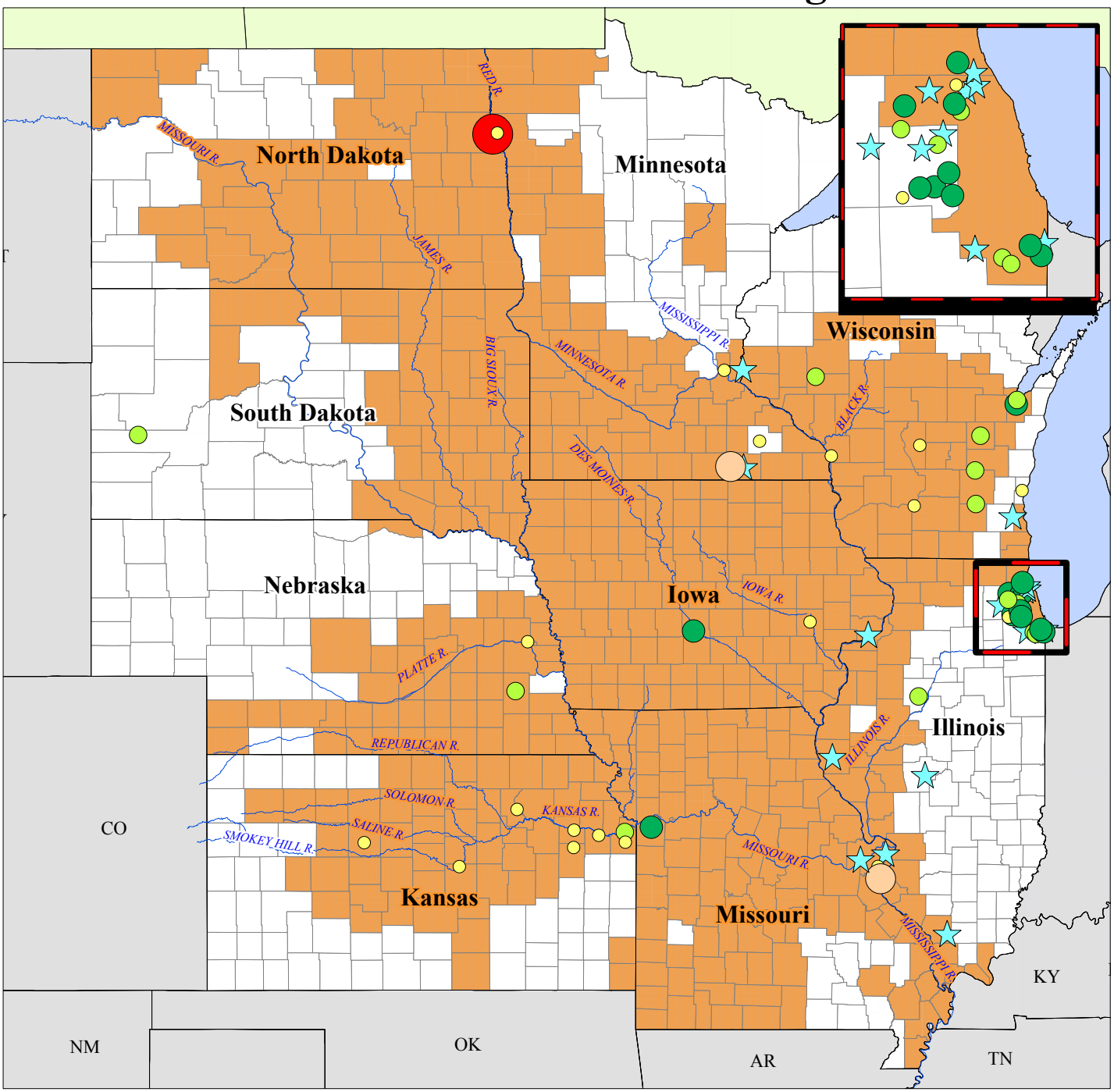
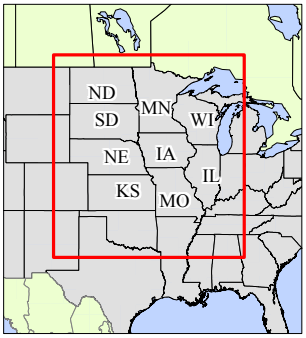
Improvement in CRS Community Ratings for the 1993 Midwest Flood Region



Location Map



Class Improvement for Each Community
from July 1993 to January 2003

- New CRS Communities
- +4 Class Improvement
- +3 Class Improvement
- +2 Class Improvement
- +1 Class Improvement
- No Improvement

1993 Great Flood Declared County

Flooding Source

U.S. Department of Homeland Security

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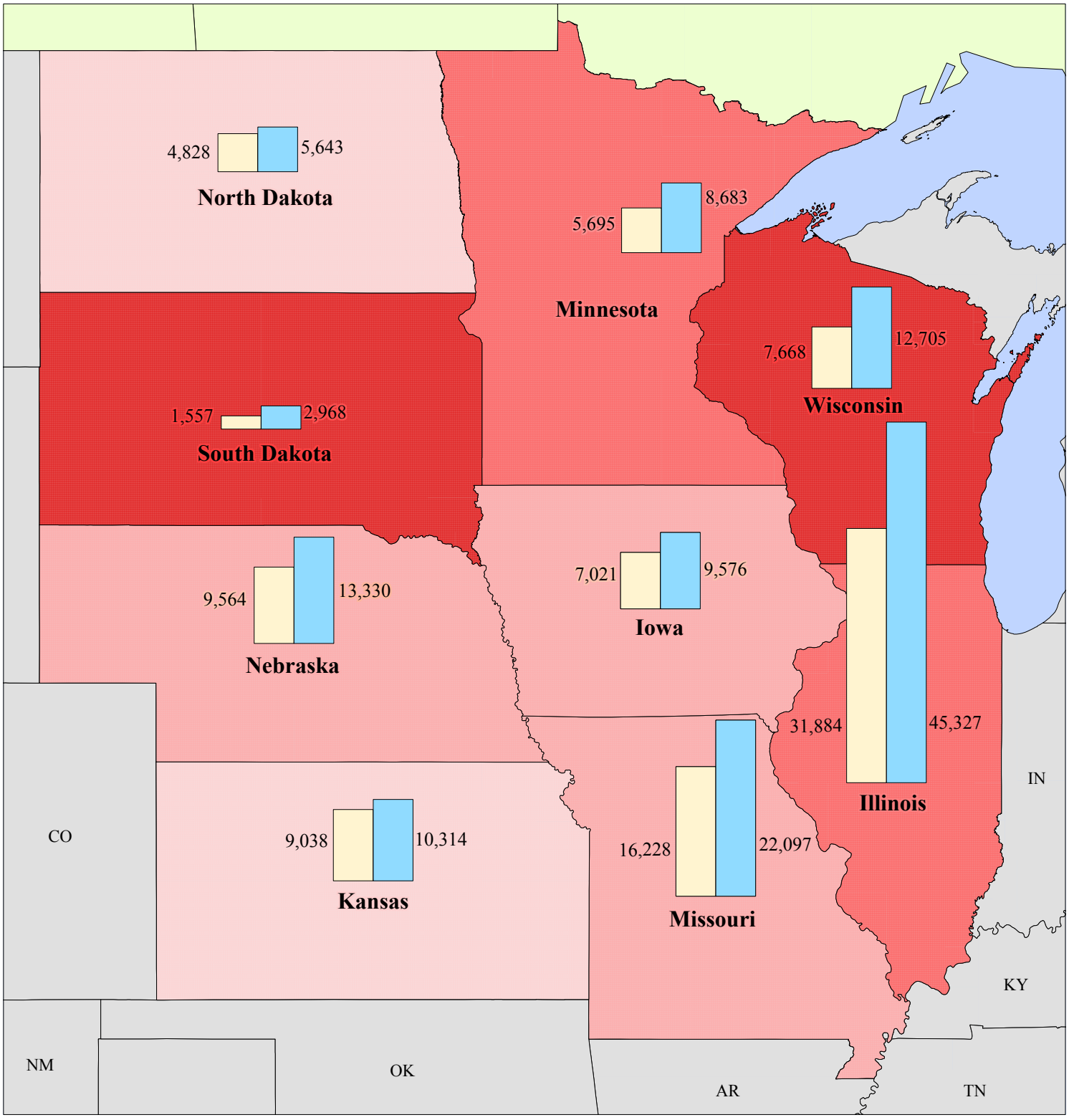
Policy Growth from July 1993 to February 2003 for the 1993 Midwest Flood Region



Percent Increase in Policies per State

- Over 60%
- 40% - 60%
- 20% - 40%
- Up to 20%

Policy Count per State

- July 1993 Policies
- Feb 2003 Policies

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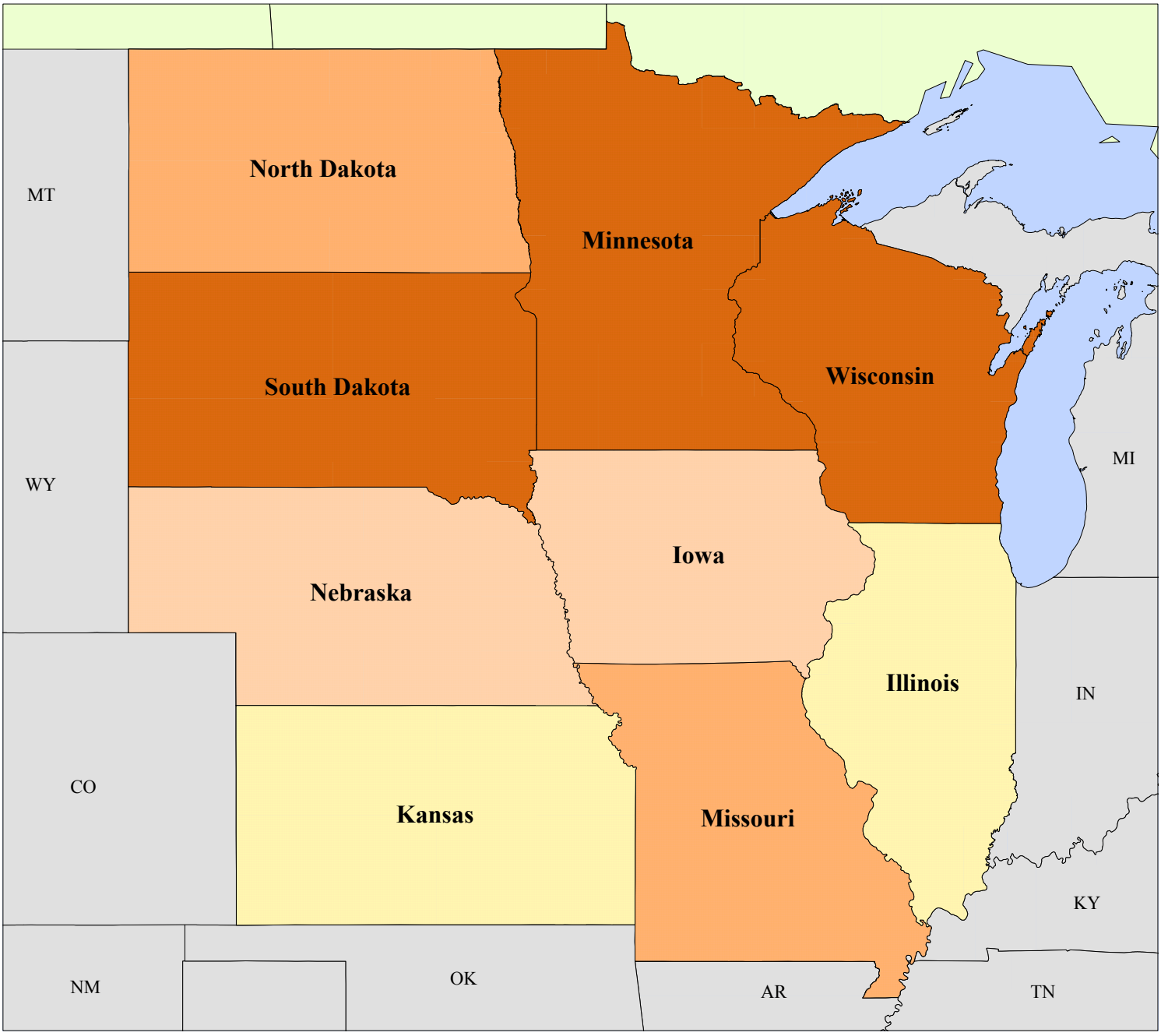
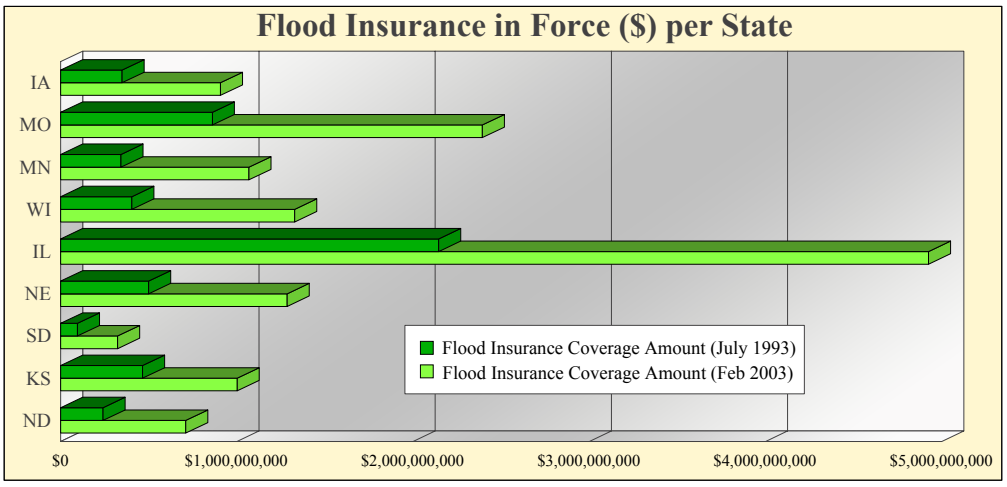
Flood Insurance Coverage in July 1993 and February 2003 for the 1993 Midwest Flood Region





Increase in Flood Insurance Coverage per State

- Over 200%
- 175% - 200%
- 150% - 175%
- 115% - 150%

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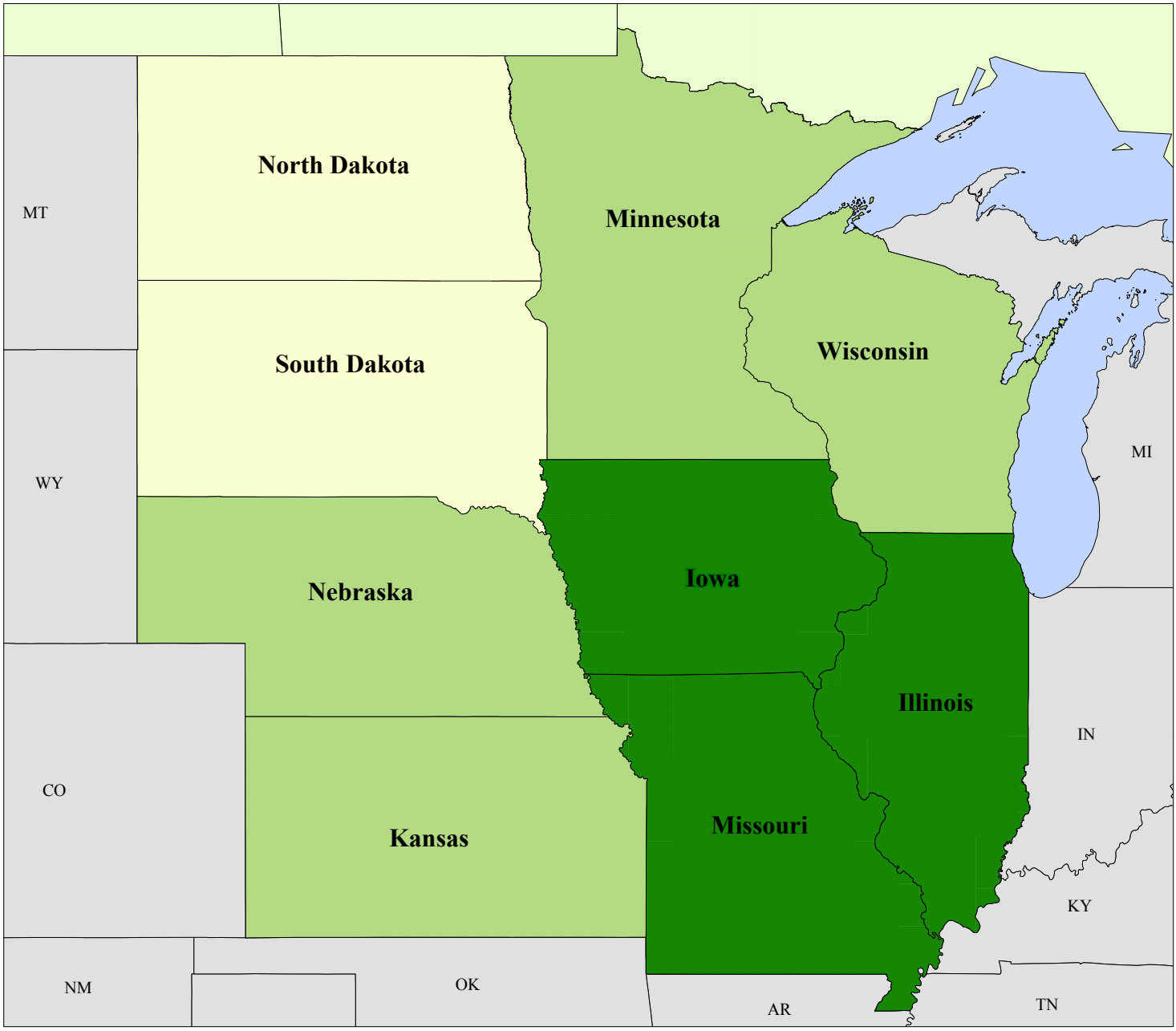
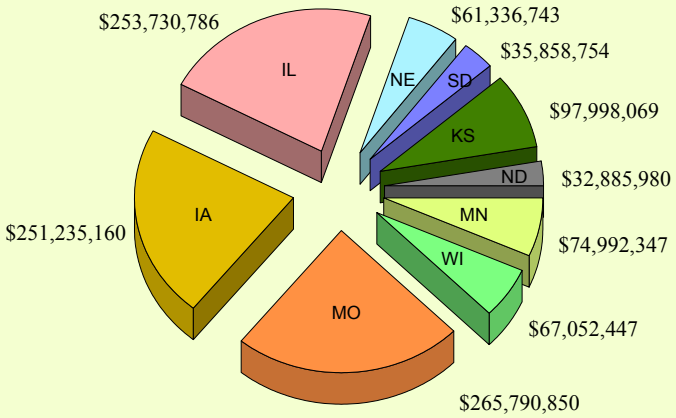
FEMA Expenditures per State for the 1993 Midwest Flood



Total FEMA Program Expenditures per State ($)



Total FEMA Obligations: $1,140,881,136

FEMA Program Expenditures per State

- Over $200,000,000
- $50,000,000 - $100,000,000
- Up to $50,000,000

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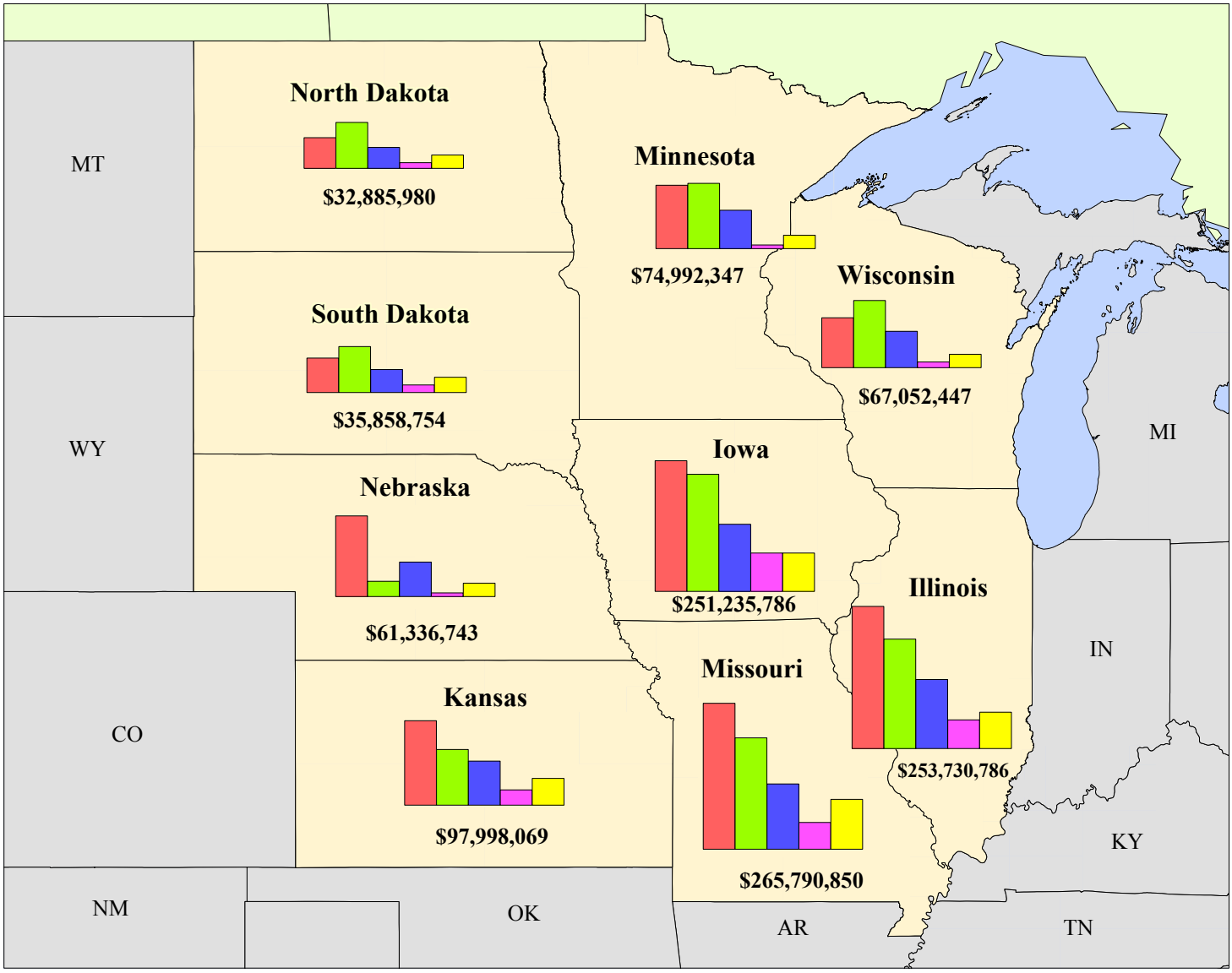
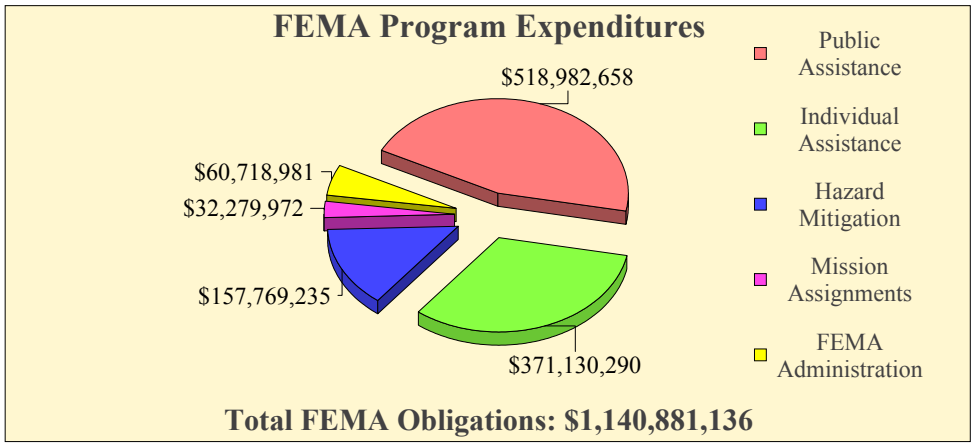
FEMA Program Expenditures per State for the 1993 Midwest Flood



STATE	REGION	PUBLIC ASSISTANCE	INDIVIDUAL ASSISTANCE	HAZARD MITIGATION	MISSION ASSIGNMENTS	FEMA ADMINISTRATION	TOTAL FEMA OBLIGATIONS
MN	5	$29,204,090	$31,105,647	$12,349,258	$277,205	$2,056,147	$74,992,347
WI	5	$20,164,187	$33,225,257	$10,944,624	$508,170	$2,210,209	$67,052,447
MO	7	$127,536,657	$80,441,375	$31,516,416	$7,017,209	$19,279,193	$265,790,850
IA	7	$105,805,204	$87,519,670	$32,603,700	$12,752,076	$12,554,510	$251,235,160
IL	5	$122,386,329	$77,427,057	$35,069,110	$7,276,428	$11,571,862	$253,730,786
NE	7	$46,242,922	$2,759,905	$10,249,345	$315,221	$1,769,350	$61,336,743
SD	8	$10,219,251	$17,345,772	$4,733,639	$877,682	$2,682,410	$35,858,754
KS	7	$48,871,802	$24,049,485	$15,868,699	$2,748,616	$6,459,467	$97,998,069
ND	8	$8,552,216	$17,256,122	$4,434,444	$507,365	$2,135,833	$32,885,980



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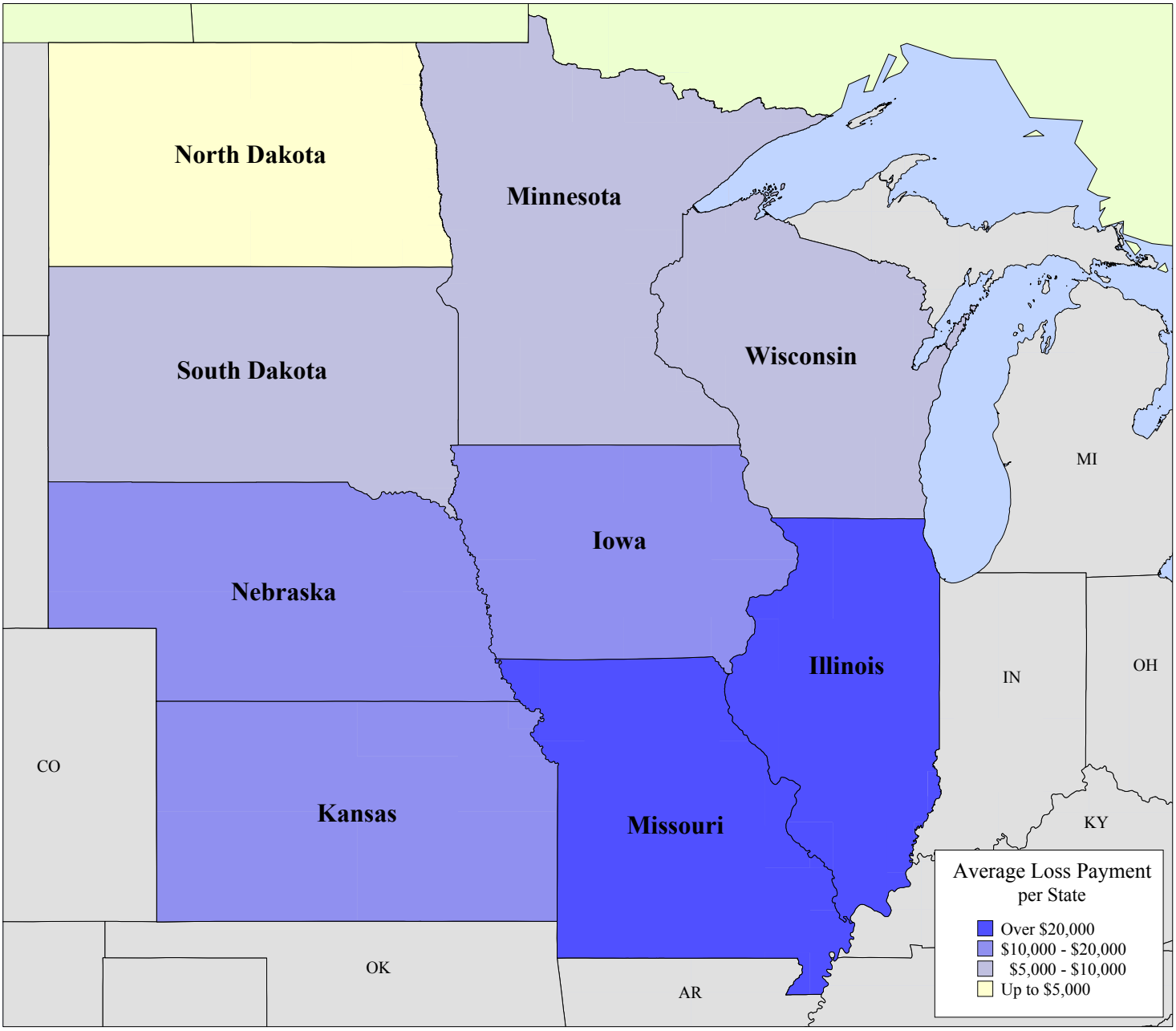
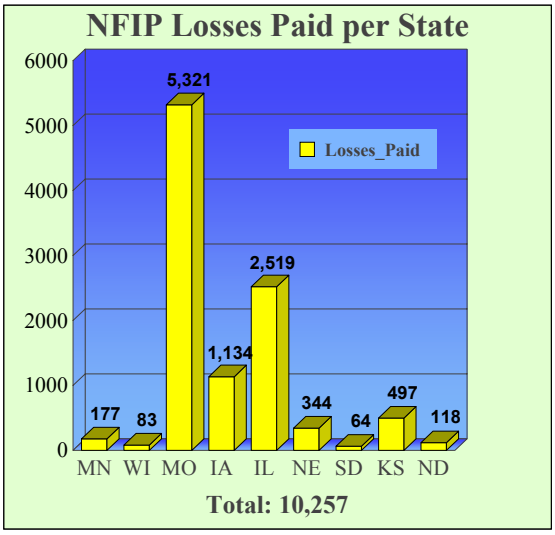
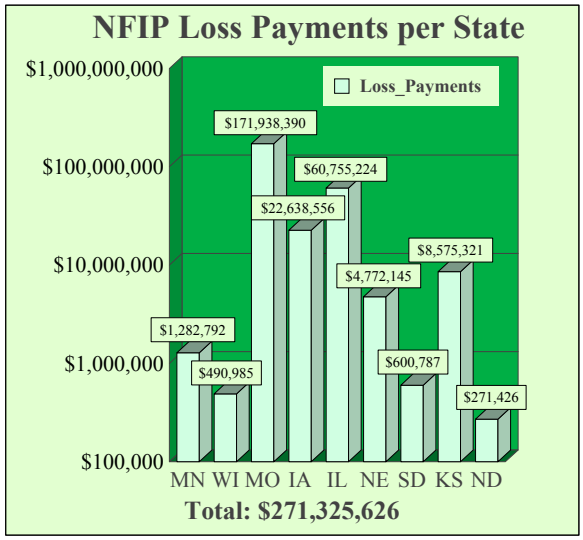
National Flood Insurance Program Losses Paid per State for the 1993 Midwest Flood







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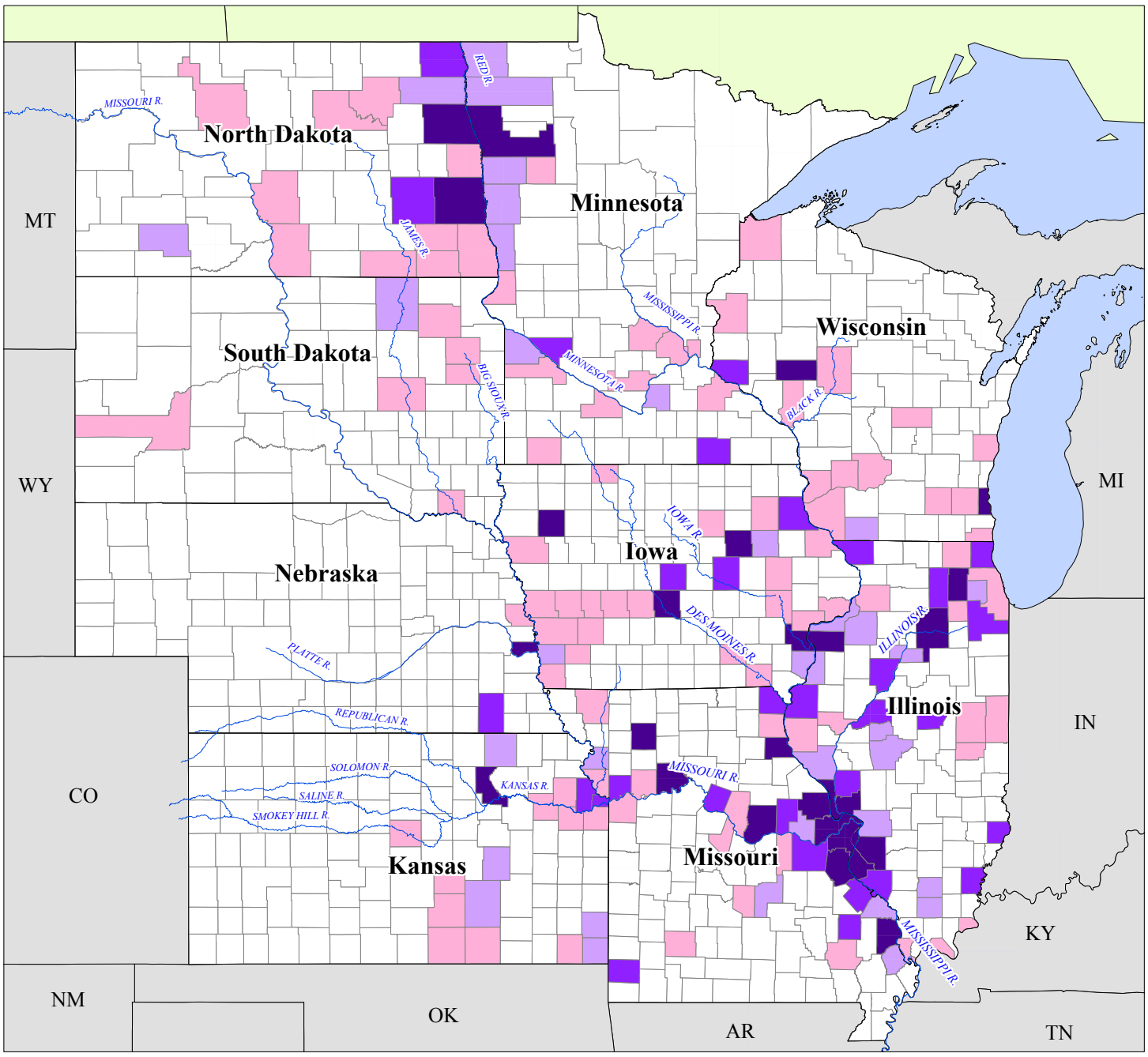
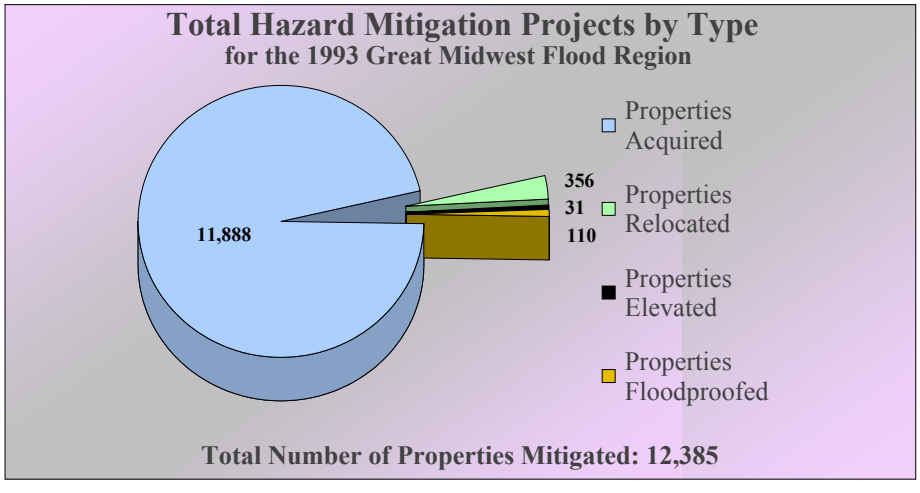
Hazard Mitigation Projects from June 1993 through April 2003 per County for the Great Midwest Flood Region





Total Mitigated Properties per County

- Greater than 100
- 50 - 100
- 25 - 50
- Up to 25

Flooding Source

U.S. Department of Homeland Security

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Appendix B

Flood Statistics Tables

Damage Estimates for 1993 Midwest Flooding[1]

in Millions of Dollars

FEMA Region and State	National Weather Service Totals	State Totals	State Agriculture	New York Times Totals	New York Times Agriculture
Region V Subtotal	**4,508**	**3,630-4,630**	**2,865**	**3,467**	**2,205**
Illinois	2,640	1,000-2,000	565	1,535	605
Minnesota	964	1,700	1,500	1,023	800
Wisconsin	904	930	800	909	800
Region VII Subtotal	**10,016**	**>6,900**	**2,231**	**6,121**	**3,726**
Iowa	5,740	>3,400	na	2,200	1,200
Kansas	551	>500	441	574	434
Missouri	3,430	3,000	1,790	3,000	1,800
Nebraska	295	na	na	347	292
Region VIII Subtotal	**1,177**	**1,196**	**1,072**	**2,095**	**1,300**
North Dakota	414	600	500	1,500	705
South Dakota	763	596	572	595	595
TOTAL	**15,701**	**12,000-13,000**	**na**	**11,683**	**7,231**

[1]Adapted from *Sharing the Challenge: Floodplain Management into the 21st Century*, a report of the Interagency Floodplain Management Review Committee to the Administration Floodplain Management Task Force, Washington, DC, June 1994, page 15.

FEMA Expenditures for 1993 Midwest Flooding
Federal Disaster Declarations[1]
in Millions of Dollars, as of March 31, 2003

FEMA Region and State	Public Assistance	Individual Assistance	Hazard Mitigation	Mission Assignments	FEMA Administration	Total FEMA Expenditures[2]
Region V Subtotal	**171.75**	**141.77**	**58.36**	**8.07**	**15.84**	**395.77**
Illinois	122.39	77.43	35.07	7.28	11.57	253.73
Minnesota	29.20	31.11	12.35	.28	2.06	74.99
Wisconsin	20.16	33.23	10.94	.51	2.21	67.05
Region VII Subtotal	**328.46**	**194.77**	**90.24**	**22.84**	**40.06**	**676.37**
Iowa	105.81	87.52	32.60	12.75	12.55	251.24
Kansas	48.87	24.05	15.87	2.75	6.46	98.00
Missouri	127.54	80.44	31.52	7.02	19.28	265.79
Nebraska	46.24	2.76	10.25	.32	1.77	61.34
Region VIII Subtotal	**18.77**	**34.61**	**9.16**	**1.39**	**4.82**	**68.75**
North Dakota	8.55	17.26	4.43	.51	2.14	32.89
South Dakota	10.22	17.35	4.73	.88	2.68	35.86
TOTAL[2]	**518.98**	**371.13**	**157.77**	**32.28**	**60.72**	**1,140.88**

[1]Nine federal disaster declarations, one for each affected state, were issued between June 11 and July 26, 1993.
[2]In a few instances, because of rounding, a column or row of figures may not sum to the total or the total FEMA expenditure indicated. All totals are correct.

National Flood Insurance Program
Claim Payments for 1993 Midwest Flooding
as of March 31, 2003

FEMA Region and State	Claims Paid	Claim Payments	Average Claim Payment
Region V Subtotal	**2,779**	**$62,529,001**	**$22,501**
Illinois	2,519	$60,755,224	$24,119
Minnesota	177	$1,282,792	$7,247
Wisconsin	83	$490,985	$5,915
Region VII Subtotal	**7,296**	**$207,924,412**	**$28,498**
Iowa	1,134	$22,638,556	$19,963
Kansas	497	$8,575,321	$17,254
Missouri	5,321	$171,938,390	$32,313
Nebraska	344	$4,772,145	$13,873
Region VIII Subtotal	**182**	**$872,213**	**$4,792**
North Dakota	118	$271,426	$2,300
South Dakota	64	$600,787	$9,387
TOTAL	**10,257**	**$271,325,626**	**$26,453**

National Flood Insurance Program
Policies in Force and Insurance in Force, Then and Now
Insurance in Force Figures in Billions of Dollars

FEMA Region and State	Policies in Force 07/93	Policies in Force 02/03	Change (N)	Change (%)	Insur. in Force 07/93	Insur. in Force 02/03	Change (N)	Change (%)
Region V Subtotal	**45,247**	**66,715**	**21,468**	**47.45**	**2.89**	**7.32**	**4.43**	**153.29**
Illinois	31,884	45,327	13,443	42.16	2.15	4.92	2.78	129.56
Minnesota[1]	5,695	8,683	2,988	52.47	.34	1.07	.73	212.39
Wisconsin	7,668	12,705	5,037	65.69	.40	1.33	.92	228.92
Region VII Subtotal	**41,851**	**55,317**	**13,466**	**32.18**	**2.17**	**5.59**	**3.42**	**157.60**
Iowa	7,021	9,576	2,555	36.39	.35	.91	.56	160.09
Kansas	9,038	10,314	1,276	14.12	.46	1.00	.54	115.47
Missouri	16,228	22,097	5,869	36.17	.86	2.39	1.53	177.94
Nebraska	9,564	13,330	3,766	39.38	.50	1.29	.79	157.63
Region VIII Subtotal	**6,405**	**8,611**	**2,206**	**34.44**	**.34**	**1.03**	**0.69**	**202.94**
North Dakota[1]	4,828	5,643	815	16.88	.24	.71	.46	195.29
South Dakota[1]	1,577	2,968	1,391	88.21	.10	.32	.23	240.22
TOTAL, Nine States[2]	**93,503**	**130,643**	**37,140**	**39.72**	**5.40**	**13.94**	**8.54**	**158.17**
TOTAL, All States	**2,683,535**	**4,402,336**	**1,718,801**	**64.05**	**250.93**	**640.05**	**389.12**	**155.07**

[1]For Minnesota, North Dakota, and South Dakota, 02/03 data and all change data were affected by the Upper Midwest flooding of 1997.
[2]In a few instances, because of rounding, a column of figures may not sum to the nine-state total indicated. All totals are correct.

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