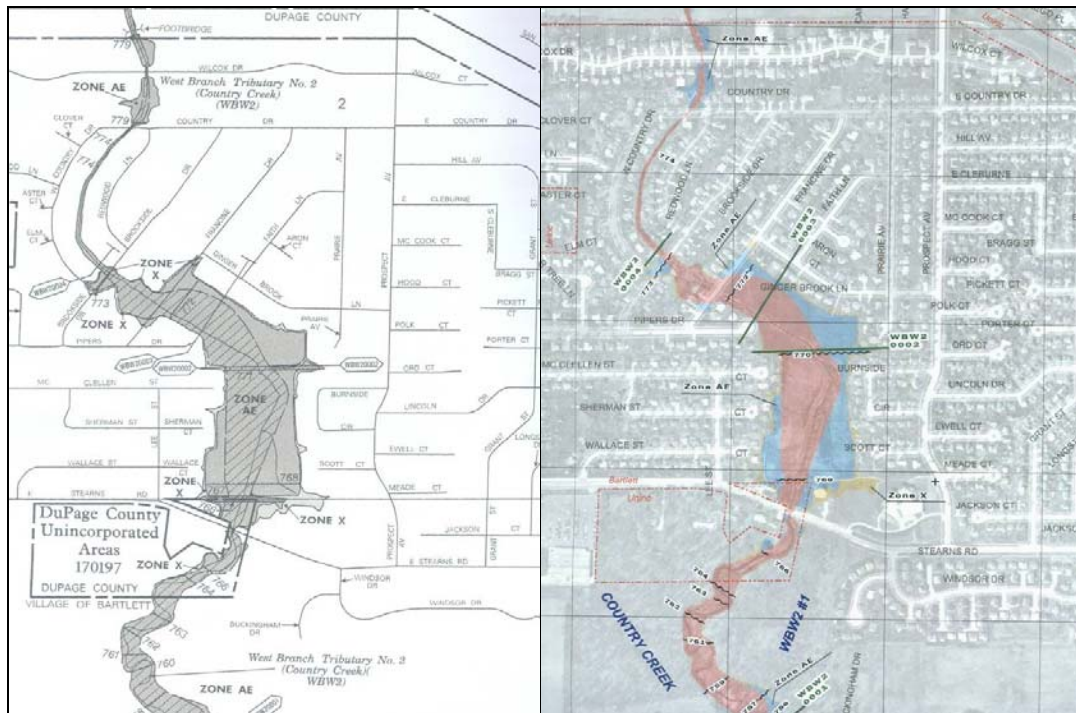


# Illinois Business Plan Update For Flood Map Modernization



Prepared by the  
Illinois Department of Natural Resources  
For the  
Federal Emergency Management Agency, Region V

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## Executive Summary

This update to the State's Business Plan serves as Illinois' "notice of interest" to continue its participation in the Federal Emergency Management Agency's (FEMA) national Flood Map Modernization Program. The intent of this program is to convert flood risk information that is in a paper map format or an older digital format; matching this to the best available topographic information and merging both into a digital Geographic Information Systems (GIS) format. The newer GIS digital format makes it possible to display floodplains on up-to-date digital orthophoto base maps. The modernization effort will benefit the nearly 800 communities in Illinois that rely on these maps to participate in FEMA's National Flood Insurance Program (NFIP).

This updated Plan requests FEMA funding for Federal Fiscal Years 2007-2009 for the Illinois Department of Natural Resources (IDNR) to develop digital flood maps (Phase I) and to maintain the data for the joint use of the State's floodplain regulatory program and the NFIP (Phase II). Illinois is in the process of completing map conversions to the DFIRM2003 format for 5 FFY04 counties and is proceeding with the conversion of 13 FFY05 counties. Pre-scoping and scoping activities are also underway for 19 FFY06 counties.

As a first step in updating this plan, IDNR and Region V staff held extensive discussions in the Spring of 2006 about the meaning and effect of the Flood Map Modernization Mid-Course Adjustment report issued by FEMA. This mid-program evaluation calls for a greater allocation of resources to those counties at greatest flood risk and a delay of mapping in lower-risk communities. As a practical matter for Illinois, the Mid-Course Adjustment resulted in a moderate re-sequencing of county map production for FFY06. Unanswered, however, is the broader question of whether the program remains a statewide effort in Illinois. To complete map modernization activities in the State, FEMA will need to fund and Illinois will need to perform map conversions in 28 and 29 counties respectively during the FFY07-08 period. This plan proceeds on the assumption that all counties in Illinois will be remapped as part of the Map Modernization Project.

FEMA's flood map modernization criteria and national milestones are based on population and flood risk characteristics. With more than 12.4 million residents, Illinois comprises nearly one quarter of the FEMA Region Five population. The state's participation will significantly help FEMA meet its national milestones while benefiting the people of Illinois.

Participation will allow the state to:

- Reduce or eliminate the potential for conflicting flood hazard information used by state regulators and communities in their NFIP floodplain management responsibilities.
- Consolidate the mapping and map tracking already in place for water resources information management.
- Combine state resources with FEMA resources to provide the most efficient use of funding.
- Use local knowledge to update and maintain flood hazard information.
- Easily incorporate stream and flood data developed by other state and local agencies to improve flood hazard information.
- Provide Illinois citizens with the most current information on flood hazards.

This Plan proposes a cooperative effort between FEMA and IDNR (Office of Water Resources and State Water Survey) to develop and maintain Illinois flood hazard data in a digital format. With

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funding from FEMA, IDNR proposes to continue modernization of flood maps over the next two years. To do this it will:

- Identify the best available digital base maps that meet FEMA standards,
- Convert Illinois flood hazard mapping to a digital, geo-database format (DFIRM2003) using the newly revised Floodplain Boundary Standard,
- Help NFIP communities adopt the new maps, and
- Develop internal tracking to coordinate state flood mitigation projects, new hydrology and hydraulics reviews for flood insurance studies, and applications for letters of map change.

The funding request for FFY07-08 averages \$5.2 million per year. These resources will permit IDNR to complete the job of modernizing maps for the remaining 57 counties in Illinois within the timeframe envisioned in the Multi-Year Flood Hazard Identification Plan. Also included in the plan is a request for map maintenance funds beginning in Federal Fiscal year 2007 and continuing through FFY2009. The total request is for \$2.64 million.

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# Introduction

Illinois has one of the largest inland systems of rivers, lakes, and streams in the entire nation. With water from 24 states entering or flowing along Illinois boundaries, flood disasters are a common occurrence in the state. Since the flood of 1993 the state has experienced seven state or federally declared flood disasters. While Illinois used to rank in the top ten states for flood insurance claims, strong state and local regulations that protect property in potential flood damage areas, and efforts to move homes and businesses out of harm's way, have removed it from the top ten. Even so, flood damage is still estimated to exceed \$700 million dollars per year in Illinois.<sup>1</sup> Therefore, the state is committed to maintaining an aggressive floodplain management and flood mitigation program supported by quality flood hazard maps.

Illinois' population is the fifth largest in the country and continues to grow, especially in the already urbanized northeastern part of the state. Based on the 2000 Census, the five counties that border Cook County each posted double digit population increases. McHenry and Will each grew by more than 40 percent. Lake County's population grew by nearly 25 percent, Kane by slightly more than 27 percent, and DuPage County by almost 16 percent. Of the 17 counties in Illinois that recorded double-digit population increases between 1990 and 2000, 11 were in the northern third of the state. Because rapid incorporation of new data due to changing conditions is critical to successful floodplain management, improved mapping is a priority and the foundation of this plan.

The Illinois Department of Natural Resources (IDNR) is responsible for managing the state's rivers, lakes, and streams. The Office of Water Resources (OWR) regulates activities within or adjacent to Illinois rivers, lakes, and streams; allocates and monitors water use from Lake Michigan; coordinates the National Flood Insurance Program (NFIP); and administers structural and nonstructural flood mitigation programs.

The State Water Survey (SWS) researches and disseminates information on surface water, groundwater, and the atmosphere. Its Center for Watershed Science provides floodplain management information and technical services to individuals, industry, business, professionals, public agencies, and governmental units.

The OWR and the SWS have worked together since the beginning of the NFIP to provide better flood information for communities and property owners. OWR's Division of Resource Management and SWS's Center for Watershed Science will continue this collaboration for the map modernization program.

## Flood Map Modernization

Most floodplain maps used in Illinois for regulatory and flood insurance purposes are paper maps called Flood Insurance Rate maps, or FIRMs. While a scanned paper map can be projected as a picture, it is not a digital product that can be manipulated and analyzed simultaneously with other data layers. In order for this to occur, the paper maps will have to be converted to a digital GIS format.

### Illinois Department of Natural Resources Website Pages

Office of Water Resources -  
[www.dnr.state.il.us/owr](http://www.dnr.state.il.us/owr)

Illinois State Water Survey –  
[www.sws.uiuc.edu](http://www.sws.uiuc.edu)

Surface Water and Floodplain  
Information Services Website:  
[www.sws.uiuc.edu/fpi/](http://www.sws.uiuc.edu/fpi/)

Flood Map Modernization  
websites:  
[www.illinoisfloodmaps.org](http://www.illinoisfloodmaps.org)  
[dnr.state.il.us/flood](http://dnr.state.il.us/flood)

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<sup>1</sup> Illinois Emergency Management Agency

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About 10 counties in Illinois already have FIRMs in a digital format, referred to as Digital Flood Insurance Rate Maps, or DFIRMs. However, these digital maps are in a format called DFIRM95 that is far below current standards. They will also have to be converted to meet standards consistent with the latest GIS technology—geo-databases—before they can be entered into FEMA’s nationwide Map Information Portal (MIP).

The map modernization activities described in this plan have been categorized as “Phase I” and “Phase II”. Phase I activities involve converting flood hazard maps into digital data (ArcGIS geo-database format) and loading it into the MIP. Phase II activities include maintaining the data, reviewing and processing map data changes, and public outreach.

Because Congress has provided FEMA with significant funding to conduct the Flood Map Modernization Program, the General Accounting Office has established national milestones for the program. FEMA has established criteria and priorities for how it will implement the program to accomplish the milestones that it must meet by 2009. The criteria are based primarily on population and risk characteristics, as modified by the Mid-Course Adjustment. Illinois is part of FEMA’s Region V, along with Indiana, Michigan, Minnesota, Ohio, and Wisconsin. With more than 12.4 million residents, Illinois makes up nearly 25 percent of the Region’s population. Therefore, it is important that flood map modernization be accomplished in Illinois in order for FEMA to reach the national milestones.

The IDNR’s Office of Water Resources and the State Water Survey developed the initial 2004 State Business Plan with the assistance of Molly O’Toole & Associates, Ltd., a watershed management consulting firm, and funding from FEMA Region V. This 2006 update was produced by IDNR.

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## Purpose of the Plan

The Illinois Flood Map Modernization Business Plan (referred to hereafter as the State Business Plan) responds to a request from FEMA for assistance in meeting U. S. flood map modernization goals. FEMA asked states to examine their existing capabilities and determine their level of interest in undertaking map modernization over multiple fiscal years.

This updated Plan outlines Illinois' approach to flood map modernization and serves as the State's "notice of interest" for continued funding from FEMA for the final two years of the program plus one follow-on year. Funding is requested for Phase I activities for Federal Fiscal Years, 2007-2008 and for Phase II activities for those years, plus one additional year for map maintenance.

### **Summary of Flood Map Modernization Activities**

#### Phase I. Develop Data for the Map Information Portal (MIP)

- Assess Community Mapping Needs.
- Develop digital base map inventory.
- Convert countywide and community flood maps to DFIRM 2003 GIS format.
- Develop web site posting of preliminary map panels for review and comment.
- Update existing and prepare new H&H data for FEMA selected counties.
- Provide assistance to NFIP communities for adopting new ordinances.

#### Phase II. Maintain MIP Data and Review Map Changes

- Statewide Digital Base Map Inventory- Maintenance
- Digital Base Map Sharing
- DFIRM Maintenance
- Hydrologic and Hydraulic Review for map changes
- Continued Assessment of Community Mapping Needs
- Technical Standards Agreement
- Establish Information Technology System to provide for data access and maintenance
- Outreach - Website Posting & Informational Mailings
- Outreach - Multi-Media Promotional Activities

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# Section I. Current Regulation and Mapping

## A. Illinois Floodplain Regulatory Activities

Illinois has regulated construction in state waters since 1914 under the Rivers, Lakes, and Streams Act of 1911, and formal administrative regulations for floodway construction have been in effect since 1975. The state regulates all development within floodways of rivers and streams as well as activities bordering public bodies of waters, including Lake Michigan. The regulations apply to any stream with a drainage area of one square mile in an urban area or 10 square miles in a rural area. State legislation provides legislative authority to regulate any development that could cause damages or an increase in flood heights. Anticipated future development and storage effects are also considered during permit review. In the six counties surrounding the Chicago Metropolitan Area, only “appropriate uses”, or non-obstructive developments, are allowed in the floodway, such as parking lots and open space. Three sections in the OWR Division of Water Resource Management are responsible for floodplain regulation.

### **Northeastern Illinois Regulatory Programs**

This section is responsible for floodplain management in the metropolitan Chicago counties of Cook, DuPage, Kane, Lake, McHenry, and Will. It issues permits for construction of dams, other construction in stream floodways, and activities in and along public water bodies. It also helps coordinate the NFIP and administers a program through which local governments are delegated authority to approve projects under the state's floodway construction rules.

### **Downstate Regulatory Programs**

This section is responsible for floodplain management in the remaining counties. It issues permits for construction of dams, other construction in stream floodways, and activities in and along public water bodies. It also helps coordinate the NFIP.

### **Statewide Programs**

This section administers the nonstructural mitigation program, which purchases and removes structures that are repeatedly flooded; and coordinates NFIP activities, regulatory floodplain mapping, approval of stream discharges used for regulatory programs, and state assistance to regional stormwater management programs.

<b>Illinois Regulations that Exceed NFIP Minimum Criteria</b>
One-tenth of a foot rise for floodways.
Model ordinances include a flood protection elevation of one foot above BFE for lowest floor elevations.
Only “appropriate uses” of floodway allowed in Northeastern Illinois.
Limit on loss of floodplain storage.
Limit on increase of velocity.

## B. NFIP Participation

More than 800 communities in Illinois now participate in the National Flood Insurance Program; most have adopted a state model ordinance that provides more protection than FEMA’s minimum regulatory requirements. Local compliance with NFIP regulations is a priority for the state, and IDNR conducts approximately 125 community contacts and floodplain inspections every year. In addition, the department holds regulations workshops for local officials, and flood insurance and floodproofing seminars for the private sector. The state has also produced several floodplain management and floodproofing publications.

## C. Floodplain Studies and Mapping

OWR's Division of Planning is responsible for planning, funding, and conducting hydrology and hydraulic (H&H) modeling for structural flood control projects. The division also works closely with local governments to prepare H&H calculations for flood insurance studies. However, modeling data from numerous streams have not yet been incorporated into flood maps, and thus is included in this plan as a Phase II objective.

## D. Flood Map Revisions

### Hydrologic and Hydraulic Reviews

In 1989, IDNR and FEMA signed a technical standards agreement for IDNR to review the H&H for letters of map change applications (LOMCs). The current agreement also addresses the state standards for activities in floodways and floodplains that exceed the minimum NFIP requirements. A second H&H review of LOMCs is conducted by a FEMA contractor prior to the processing of the amendment or revision.

### Letters of Map Changes

Through the current technical standards agreement, IDNR reviews Letters of Map Revisions (LOMRs) and Letters of Map Amendments (LOMAs) when they involve changes in discharges or involve activity in a floodway. If IDNR approves, FEMA issues a Conditional LOMR or LOMA. CLOMRs and CLOMAs approval is required from IDNR before FEMA reviews the application.

Much of the review conducted by FEMA's contractor duplicates IDNR's efforts. Table 1 shows an estimate of annual map revision applications processed by FEMA's contractor. Generally, there is a growing number of LOMC each year.

### Letters of Map Changes (LOMC)

CLOMA- Conditional Letter of Map Amendment

LOMA- Letter of Map Amendment

LOMA-F- Letter of Map Amendment for Fill

CLOMR-Conditional Letter of Map Revision

LOMR-Letter of Map Revision

MT-1 - Application for LOMA

MT-2 - Application for LOMR

**Table 1.**  
**Estimate of Annual Map Revisions -- Illinois Letters of Map Changes**

Year	CLOMA/LOMA (MT-1)*		CLOMR/LOMR (MT-2)*	
	Received	Completed	Received	Completed
FY00	628	565	86	56
FY01	902	744	94	65
FY02	953	747	121	74
FY03	1,020	844	109	68

\* While some applications are more extensive, the average review time for a CLOMA and LOMA is 8 hours, and the average review time for a CLOMR and LOMR is 70 hours.  
Source – PBS&J (FEMA Contractor)

## E. Current Flood Map Formats

FEMA's Flood Insurance Rate Maps began to be modernized in the 1990s with the development of countywide maps and digital FIRMs. Rather than having separate maps for each community that participates in the NFIP, countywide maps provide a seamless map for all communities within a

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county. Disconnects or inconsistencies in flood levels from one community to the next have to be addressed. The digital FIRMS, or DFIRMS, that were developed in the past are predominately in a DFIRM95 format, an older digital flood data format (AutoCAD) that cannot be used in the Map Information Portal.

As of 2004, only 17 of Illinois' 102 counties had a countywide FIRM. Ten of those counties also had flood data in the older digital format.

## Section II. Current State Capabilities and Resources

### A. Human Resources

#### **IDNR Office of Water Resources**

IDNR Office of Water Resources (OWR) is organized into five divisions, two of which deal with floodplain management. Their responsibilities are described in Section 1 subsections A-C.

#### **IDNR State Water Survey**

Located on the University of Illinois campus in Champaign, the Illinois State Water Survey is the primary state agency for research and information on surface water, groundwater, and the atmosphere. One-third of SWS staff is funded through the States general revenue fund and two-thirds are funded by grants and contracts through the University of Illinois. The SWS is organized into six sections and the Office of the Chief.

**Table 2.  
IDNR/Office of Water Resources - Personnel**

<u>Division of Resource Management - Engineers:</u>	<u>FTEs:</u>
Northeastern Illinois Regulatory Program	5.0
Northeastern Illinois H&H/CLOMR Review	1.3
Downstate Regulatory Program	5.0
Statewide Program - NFIP Coordination	3.0*
Flood Mitigation	1.3
Total:	17.1
<u>Division of Planning - Engineers:</u>	<u>FTEs:</u>
Flood Control Studies (Including H&H Studies)	18

\* 2.5 Full-Time Employees (FTEs) are funded through FEMA's Community Assistance Program-State Support Services Element.

The Center for Watershed Science is responsible for the "Surface Water and Floodplain Information Services" program, a public service that provides information and technical services related to floodplain management. The section has 10 engineers and hydrologists that conduct applied research in water resources. The Geographic Information System Resource group, under the Office of the Chief, provides GIS assistance to all the Sections of the survey. The floodplain program is supported by an award-winning web development team.

**Table 3.  
IDNR/State Water Survey  
Personnel in Floodplain Services**

<u>Center for Watershed Science:</u>	<u>FTEs:</u>
Engineer	0.5
CFM	0.7
Total:	1.2

The Illinois CTP project team consists of two groups, one located in Champaign Illinois and the other in Springfield Illinois. The Champaign team at the Illinois State Water Survey, a division of the IDNR, is comprised of engineers and GIS professionals split into 4 self-contained teams. These teams are responsible for the performance of all engineering and mapping tasks on the Flood Map Modernization Project. In addition to the Mapping Program and GIS Manager, the Champaign team has 16 GIS Professionals, 4 Engineers, and 2 Information Specialists. The Springfield team, located within the Office of Water Resources' Division of Resource Management, is responsible for pre-scoping and scoping tasks, post-processing activities, public outreach, and project administration. Besides the Project Manager, the team is comprised of six professional staff with an additional 5 people expected to be added soon.

## B. Mapping Resources

OWR maintains regulatory floodway maps for northeastern Illinois and the SWS Floodplain Information Program provides map and database information for Illinois ([www.sws.uiuc.edu/fpi/](http://www.sws.uiuc.edu/fpi/)). Fees are charged for some of the SWS services. The Floodplain Information Program makes the following data available:

Zone A flood elevations. Estimations of 100-year flood elevations for individual properties for Zone A floodplains and Base Flood Elevations from published profiles for specific sites.

Map Repository. Current FEMA flood hazard maps and Flood Insurance Studies (FIS) developed for the NFIP, engineering data and supportive studies related to flooding, a complete set of National Wetlands Inventory maps, U.S. Geological Survey topographic quadrangles, and various surface water data files.

Flood Discharges. Online searchable database of streamflow flood discharges that are certified by OWR and published in current FIS's. The database fields include river basin, stream name, drainage area, location description, Township-Range-Section coordinates, and source document. Updates are made as new and revised FIS's are published.

Hydraulic Model Database. A searchable inventory of floodplain hydraulic models maintained by the SWS is posted online for technical users, who may order copies. The primary source of the model data is the FEMA archives for Flood Insurance Studies. NOTE: this database does not contain all of the most current regulatory models or all the FIS models that exist.

Digital Ortho-Quadrangle Data. Produced by the USGS and packaged for distribution by the Illinois State Geological Survey, DOQs are available for the entire state. The ISGS has recently released the "next generation" of DOQs that can be used as digital base mapping for Illinois' rural areas. These images were acquired in April, 2005 and have a scale of 1 inch = 500 feet and 1 inch = 100 feet in the 6-county metropolitan area.

Digital Statewide Floodplain Boundary Data. Over a period of years, the SWS digitized the 100-year and 500-year floodplains from FIRMS in unincorporated areas of the state using ArcInfo. The digital data is available county by county. This coverage is consistent with the current FIRMS in the rural central and southern part of the state, but is not current in the northeastern portion.

**Table 4.  
IDNR/State Water Survey  
Personnel in Map Modernization**

<u>Champaign Team</u>		FTEs:
Mapping Manager		1.0
GIS Manager		1.0
GIS Specialist		4.0
GIS Analyst		12.0
H&H Engineer		4.0
Information Specialist		2.0
Student Interns		<u>2.0</u>
	Total	26.0
<u>Springfield Team *</u>		FTEs:
Project Manager <sup>1</sup>		1.0
Scoping Officers		3.0
Post-Processing Officers		3.0
Post-Preliminary Technician		0.6
Technical Writer		1.0
Print Technician		0.6
Compliance Officer <sup>2</sup>		1.0
Student Intern		<u>0.6</u>
	Total	10.8

\* Includes anticipated staff additions for FFY06 Projects

<sup>1</sup> Funded out of the MMMS Grant

<sup>2</sup> Partially funded by CAP-SSSE

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## C. Cooperative Technical Partnerships

Two Illinois counties and one community are part of FEMA's Cooperating Technical Partnership (CTP) program and have signed Mapping Activity Statements that outline the hydrologic and hydraulic analyses to be done and the mapping products to be produced. This Plan assumes that existing CTP agreements will remain in place.

**DuPage County** has been a CTP since 1999. It has a population of more than 900,000, a little over seven percent of the state. Its most recent Mapping Activity Statement calls for GIS-based flood data and base map data for tributary streams being studied.

**Kane County** signed a CTP agreement with FEMA in 2001 to perform hydrologic and hydraulic analyses and to provide improved flood hazard mapping for the Blackberry Creek watershed. Its Mapping Activity Statement calls for the use of 1995 flood data specifications rather than the current specifications for ArcGIS flood data and base map data.

**The city of Hamilton** in Hancock County became a CTP in 2001. Its agreement calls for producing maps rather than digital data.

Map conversions in five counties are being done by FEMA contractors and, therefore, are not part of this Business Plan. Work began in these counties prior to the start of the Map Modernization Program. The counties are:

- St Clair
- Madison
- Winnebago
- Peoria
- McHenry

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## Section III. Flood Map Modernization Goals

### A. Summary of State Needs

All Illinois communities participating in the NFIP are mapped. More than 400 non-NFIP communities remain unmapped. As of March 2004, the average age of Illinois FIRM maps was nine years. In northeastern Illinois, where 65 percent of the State's population is located, FEMA calculates the average age of FIRMs as six years. These map ages represent the average time since the maps were re-published. While some maps may have been re-published with new data, most often they were merely re-published in a countywide or DFIRM95 format—the age of the FIRM usually does not reflect the age of the base map or the flood data. This is an important distinction in Illinois given that areas of the State, such as northeastern Illinois, have experienced a significant population increase over the last decade.<sup>2</sup> The population increase has led to changes in land cover and runoff rates, not to mention the construction of flood control structures. Many FIRMs do not reflect these changes.

Illinois recognizes that it needs better flood hazard maps for northeastern Illinois and other urban, and urbanizing, areas of the State. IDNR views the importance of this as twofold: for the improvement of the NFIP and for the improvement of the State's regulatory floodplain program. However, Illinois also recognizes that converting existing flood data and base maps into a digital format and matching these data to the best available topographic information is a critical first step. Once existing data has been put in a digital format, new study data can be incorporated to improve the quality of flood maps in Illinois.

### B. FEMA Flood Map Modernization Objectives

FEMA initiated the Flood Map Modernization Program with funding from Congress in federal fiscal year 2002. The long-term vision of the program, expressed in the *Multi-Year Flood Hazard Identification Plan*, is to:

- establish and maintain a premier flood-hazard data collection and delivery system;
- build and maintain mutually beneficial partnerships;
- achieve effective program management;
- and, expand and better inform the user community.
- 

To this end the program has established objectives and key performance indicators to measure progress. The initial program goal was one of providing a digital flood layer for the entire nation. The new estimates of digital products that will result from the Mid-Course Adjustment (expressed on the basis of population) are:

- 92 percent of the Nation's population will have new digital flood maps.
- 40 percent of the Nation's population will have maps that encompass stream miles based on new, updated, or validated engineering analysis.

FEMA established key performance indicators to measure progress towards these objectives

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<sup>2</sup> Population in northeastern Illinois increased 11 percent between 1990 and 2000; Will County alone saw a 40 percent increase.

(Table 5).

**Table 5.  
Map Modernization Key Performance Indicators  
FY 2004 – 2008**

<b>Sub-Program Element Performance Measures</b>		<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
<b>KPI 1</b>	Percentage of population with digital GIS flood data available on-line.	20%	50%	50%	60%	70%
<b>KPI 2</b>	Percentage of population with adopted maps that meet quality standards.	10%	20%	25%	35%	50%
<b>KPI 3</b>	Percentage of leveraged contributions toward digital flood data.	20%	20%	20%	20%	20%
<b>KPI 4</b>	Percentage of appropriated funds sent to CTPs (States and locals)	20%	25%	33% *	33% *	33% *

*Note: KPIs 1 and 2 are cumulative. KPIs 3 and 4 are annual  
\* These targets for FY06-FY08 depend on the ability to develop local and state capability.  
There are significant assumptions in KPI 4 and FEMA is examining strategies to achieve the target.*

### C. Illinois Flood Map Modernization Goals

IDNR has identified the following goals for flood map modernization in Illinois:

- Participate in FEMA's Flood Map Modernization Program to the fullest extent possible. Full participation will foster the State's own floodplain management goals.
- Reduce or eliminate discrepancies in flood hazard mapping that cause inconsistent administration of federal, state, and local regulations.
- Ensure that good flood hazard mapping is developed to foster better watershed management throughout Illinois.
- Maximize state resources for flood map modernization, including developing digital data and maintaining maps.
- Incorporate better flood data and base mapping into regulatory flood maps when it exists.
- Reduce or eliminate duplication of federal and state efforts in reviewing flood map revisions.

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## Section IV. Status of Map Modernization in Illinois

The Illinois CTP was established in May, 2004 with work beginning in earnest on FFY04 counties in January, 2005. Below is a summary of the activities undertaken to date and a brief discussion of issues affecting the program.

### A. Mapping Progress by Fiscal Year

**FFY2004-** The FFY04 Mapping Activity Statements signed by IDNR and FEMA in September 2004 called for the completion of floodplain mapping in four Illinois counties (Clinton, Kane, Rock Island, and Sangamon) by the end of 2005; the initiation of map conversion in one county (Champaign) with completion expected in the following fiscal year; and, the review and updating of H&H information in two counties (Cook and Kendall) as a prelude to mapping work in FFY05.

Due to delays during the startup phase specifically related to the approval for hiring, work on FFY04 counties did not begin in earnest until January 2005. By the end of the second calendar quarter of 2005, Project Team and Scoping meetings had been conducted and completed for each FFY04 county and scoping reports were filed with FEMA Region V. For H&H counties, a prioritized list of tasks was submitted to FEMA in June 2005 representing OWR's recommendations for work that could be accomplished within the budget established in the Mapping Activity Statements for those counties.

Mapping activities in each of the four conversion counties proceeded at different rates during 2005 with DFIRM and FIS distribution expected by the end of the calendar year, continuing on into the first quarter of calendar year 2006. In actuality due to the initial startup delay an extension was necessary to complete mapping in Clinton, Rock Island, and Sangamon Counties by the beginning of the second quarter of 2006. Completion of floodplain mapping for Kane County was postponed initially pending review and approval of H&H studies paid for under a separate CTP agreement between FEMA and the county. Also, additional money was added to the FFY06 CTP Cooperative Agreement to complete the transfer of modeling studies to mapping; a task that was more rigorous than anticipated. Finally, preliminary mapping showed that additional work by the modeling contractor was necessary to revise and improve floodway delineations for Blackberry Creek. Release of the preliminary maps for Kane County is awaiting completion of the contractor's revisions.

The review and compilation of H&H studies for Cook and Kendall Counties was also delayed due to difficulties in obtaining approval to hire engineering staff. Two schedule extensions (one within the MAS timeframe) were requested to shift the completion deadline first from the Fall of 2005 to the Winter of 2006 and then to the Summer of 2006. The transfer of modeling results to maps for Cook County was finished by the end of July 2006. Completion of preliminary mapping for Cook County under the FFY05 agreement is still on schedule for the end of 2006. Kendall County H&H work is complete and undergoing an independent QA/QC review as of the writing of this report in early October 2006. The expectation is that the completion of FFY05 mapping for Kendall County will be delayed by several months.

The scorecard for the FFY04 counties therefore is as follows: two of the four map conversion counties (Clinton and Sangamon) are proceeding towards finalization; preliminary DFIRM panels and an FIS Report are prepared for Rock Island County but are on hold pending resolution of levee issues; and, Kane County is delayed while the contractor revises floodway delineations for

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Blackberry Creek. Partial mapping for Champaign County was completed under the FFY04 MAS. The review and updating of H&H information for Cook County is complete. Kendall County modeling is undergoing an internal QA/QC review and the mapping is therefore a few months behind schedule.

**FFY2005** - Mapping Activity Statements were prepared jointly by OWR and SWS personnel for 13 Illinois counties in the May-June 2005 period. These were approved with minor revisions by FEMA Region V and signed in early July 2005. The CTP Grant was awarded in early August and work began at this point to organize and conduct Project Team and Scoping meetings throughout the fall of 2005 with map conversion work beginning in early 2006. The CTP is compiling new or revised hydrologic or hydraulic modeling data in LaSalle and Will Counties; conducting floodplain mapping, Digital Flood Insurance Rate Map (DFIRM) production, and post-preliminary processing in Alexander, Clark, Cook, DeWitt, DeKalb, Jackson, Kendall, Livingston, McLean, Monroe, Randolph, Union, and Williamson Counties; and conducting post-preliminary processing for the counties of Champaign, Clinton, Kane, Rock Island, and Sangamon begun in FFY04.

Distribution of the Clinton County preliminary DFIRMs and FIS Report occurred in April 2006 followed by an Open House meeting to present study results in May, 2006. The county is expected to go "LFD" in early December. Sangamon County's DFIRM panels and FIS report were distributed in mid-June 2006 followed by an Open House at the end of July 2006. The county is projected to go "LFD" in January when the Appeals Period final comments conclude. Rock Island County's maps and FIS report were prepared for distribution in early April but were held by FEMA pending resolution of levee certification issues. As of the writing of this report in early October 2006, the Rock Island study is still on hold. Champaign County DFIRM production is 60 days behind schedule and is expected to require a time extension to complete post-preliminary activities before the expiration date of the FFY05 Cooperative Agreement at the end of July 2007. Work on the county was delayed pending delivery of new flood study information for Boneyard Creek in September 2006. The internal QC review of Kane County maps is complete, however, the study is on hold until revisions to the Blackberry Creek floodway can be made by the contractor.

Clark County DFIRMs and the FIS Report went preliminary in August followed by an Open House on September 13. Letters of Final Determination are projected to go out in late January or early February, 2007. DeWitt County DFIRMs and the FIS report were mailed out at the end of September and an Open House is planned for early November. Livingston, Union, and Jackson Counties could possibly go preliminary by the end of 2006.

As noted above, Kendall County floodplain mapping is expected to be delayed several months into 2007, thus requiring a time extension on the MAS agreement. Currently, the H&H work and mapping is undergoing an internal QC review before the data are incorporated into Kendall County flood map panels. Cook County floodplain mapping under the FFY05 MAS is on schedule for delivery in late 2006. The expectation is that the county will go preliminary sometime late in the first calendar quarter of 2007.

The balance of FFY05 counties including: Alexander, DeKalb, McLean, Monroe, Randolph, and Williamson are behind schedule by several months and are projected to be done near the end of the first quarter of calendar year 2007. Review and compilation of H&H work for LaSalle and Will Counties is on schedule.

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**FFY06** - Mapping Activity Statements were prepared jointly by OWR and SWS personnel for 22 Illinois counties in the June-August 2006 period. These were approved with minor revisions by FEMA Region V and signed in early September 2006. As of the writing of this plan update, Project Team and Scoping meetings have been organized and conducted for nearly half of the counties with mapping work expected to begin in early 2006. The CTP is conducting floodplain mapping, Digital Flood Insurance Rate Map (DFIRM) production, and post-preliminary processing in the counties of: Adams, Brown, Calhoun, Cass, Fulton, Greene, Jersey, Kane, Kankakee, Lee, Mason, Menard, Morgan, Ogle, Pike, Schuyler, Scott, Stephenson and Will and pre-scoping and scoping in the counties of Grundy, Iroquois, and LaSalle. Floodplain mapping in the latter will be accomplished in the FFY07 agreements.

## B. County Prioritization

As noted earlier in this plan, FEMA instituted a Mid-Course Adjustment in the Flood Map Modernization Program in the spring of 2005. The adjustment was based on stakeholder recommendations that indicated a preference for FEMA to focus on developing flood maps that meet new, higher standards for mapping and for allocating a greater percentage of resources to those communities at greatest flood risk. Many states (not including Illinois) and professional organizations continue to express this preference, realizing that it will delay development of new maps for communities facing less flood risk.

As initially envisioned in 2003, Flood Map Modernization would focus on creating a digital flood layer for all communities at risk of flooding. As a result of the Mid-Course Adjustment, it is now estimated that 90 percent of the Nation's flood risk will be mapped by the conclusion of the program. In Illinois the effect of allocating a greater percentage of resources to those communities with greater flood risk will be to shift the program towards more urbanized and urbanizing counties at the expense of rural counties with slower growth. This re-focusing of the program combined with its continued under-funding raises the possibility that not all counties in the state will be mapped within the Map Modernization Program. At the present time in Illinois more than half of the counties (57) remain to be mapped in the final 2 years of the program but more than half of the money allocated for the State has already been spent based on MHIP Version 2.0

## C. Risks to Completion of Mapping Activities

The completion of mapping activities on schedule and on budget is the goal of everyone involved in the Map Modernization Project in Illinois. The taxpayers whose money supports the project deserve nothing less. To accomplish this goal Illinois believes that periodic, frank discussion between FEMA and its Cooperating Technical Partner is required and the results of these discussions must have an impact on the process. Feedback and the adjustments made to the project must come not only from the top down but from the bottom up as well. To this end, the following discussion of risks to program completion is provided.

Under-funding continues to be an impediment to recruiting, training, and retaining a sufficient number of employees to complete the project. Illinois has noted in the past the difficulty in competing economically for engineers with the private sector. GIS professionals are likewise in demand and salary will be a key factor in their retention especially in light of the finite nature of this project. In addition to increasing funding levels or at a minimum restoring funds to levels previously contained in the MHIP, FEMA

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must move decisively in Illinois' opinion to establish a maintenance effort with dedicated funding by the start of the 4<sup>th</sup> year of the Map Modernization Project if trained staff are to be retained for the next phase and project momentum maintained.

Under-funding is also an impediment to keeping the project on schedule. It is unrealistic to continue to delay counties to a later fiscal year in the hopes that somehow efficiencies will be achieved that will allow 50 percent more work to be accomplished for the same amount of money. Moreover, postponing counties due to under-funding has created a situation in Illinois where more than half of the counties remain to be done in the last two fiscal years of the project while more than half of the money allocated in the MHIP Version 2.0 has been spent. The implication is clear and unacceptable to Illinois; that being, that some counties and communities will not be mapped within the Map Modernization Program or even in the foreseeable future.

Not only must more funding be found and restored to the project but Illinois believes that at the same time procedural inefficiencies must be wrung out of the program so that existing dollars are stretched as far as possible. A case in point is the inclusion of non-participating communities (communities not in the NFIP) in post-preliminary activities. Illinois sees little or no benefit to this practice since project materials are readily available to non-participating communities on-line for viewing and download.

Another cost saving measure would be to eliminate the expense of preparing two-color photographic negatives for each map panel for the purpose of printing and distributing z-folded paper maps. Instead, distribution of DFIRM panels and the FIS report should be by digital means only either on a CD/DVD or through the internet. If there are small, rural communities without computer access it would be cheaper for FEMA to purchase a computer for the community rather than continue the current method of photo offset printing and map distribution.

Other factors in the Map Modernization Program are increasing the time it takes to complete a countywide study adding to the cost of the project for a state CTP. Changes in procedures, additional tasks, and new standards, often implemented after budget estimates and schedules are set, are making it difficult if not impossible to complete a countywide project in 24 months and are adding additional administrative work and expense associated with time extensions. FEMA should consider signing 30 month agreements going forward in the project to accommodate programmatic changes and procedural additions.

Recognition that additional time is necessary must also be accompanied by a realization that State partners necessarily operate differently from an IDIQ. As a government entity a State CTP has a lot of advantages (e.g., built-in accounting systems, pre-existing procedures for purchasing, and regulations that govern things like travel and lodging). These guarantee that expenditures are properly monitored and transparent. Moreover, as noted earlier in this plan Illinois has a long history of involvement with floodplain management issues and therefore, certain synergies exist that benefit the Map Modernization program. On the negative side, government hiring and contracting are frequently cumbersome processes that are not easily adaptable to new and changing

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circumstances. Consequently, new procedures, additional tasks, and new standards implemented after a contract is signed are problematic. Thought must be given on how to build flexibility into the MAS process to deal more effectively with unforeseen circumstances for example, holds placed on counties where levee investigations are occurring or the need for map panel revisions after an MAS agreement has ended. A possibility might be the addition of a specific activity with funding to take care of clean-up work.

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## Section V. Activities Identified for Map Modernization

Expanding IDNR's in-house resources and using them for flood map modernization is Illinois' best option for meeting FEMA's Map Modernization goals. Phase I development activities present the most significant challenge—in administration, scheduling, funding, and quality assurance.

Conducting the mapping in-house:

- Provides a means to conduct data development and adapt to on-going changes in MIP requirements.
- Combines OWR's NFIP responsibilities and SWS's flood information with FEMA's vision of flood map modernization and the Map Information Portal.
- Gives IDNR the ability to pilot conversion efforts and other project elements.
- Reduces the project management requirements of parallel efforts.
- Allows IDNR to draw on the personnel resources offered by its connection to the University of Illinois.
- Allows Phase II inventory and map maintenance activities to be developed concurrently with Phase I activities.
- Provides for a smooth transition from Phase I digital data development to Phase II map maintenance.

Increasing IDNR's staff and resources for the project is an efficient and cost effective way to accomplish FEMA's goals and comply with Congressional directives.

### A. Phase I – Flood Map Modernization

#### 1. Develop Digital Map Data

Three activities are needed to accomplish this step:

- Assess community mapping needs.
- Develop digital base map inventory.
- Convert FIRMs and DFIRMs to digital format.

##### a. Assess Community Mapping Needs

Though FEMA lists this activity as a fundable Phase II activity, IDNR feels it should be started at the onset of Phase I where it is a logical part of project scoping. While assessing mapping needs is an ongoing effort at IDNR, it will be expanded during Phase I to review available base mapping and H&H information as well as geographic areas that may have developing mapping needs including the restudy of existing approximate A Zones and the need to define new A Zones. The assessment, which will be part of scoping as well as a separate activity funded under the MMMS Best Practices Award for FFY06, will allow the state to identify where better flood hazard information is needed for both the flood insurance program and the regulatory floodplain program.

It is anticipated that some mapping needs may also be identified when communities review preliminary DFIRMS. The information will be provided to FEMA for input into the Mapping Needs Update Support System (MNUSS).

Lead: OWR

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Timing: Years 1 and 2, then ongoing  
Funding: Years 1 and 2, then ongoing  
Staffing: Years 1 and 2, then ongoing

b. Develop Digital Base Map Inventory

This effort will largely consist of identifying aerial mapping and ortho-imagery at the community level. IDNR will work cooperatively with communities to inventory digital mapping and share available information. Figure 1 shows the Illinois counties that use or are developing GIS capabilities.

In areas without GIS capability, medium resolution ortho-imagery flown in 2005 and currently available statewide will be used as base maps.

This activity will also include an inventory of available digital elevation data on a county-by-county basis in keeping with the new Floodway Boundary Standard.

Lead: SWS  
Timing: Years 1 and 2, then ongoing  
Funding: Initial and ongoing  
Staffing: Years 1 and 2, then ongoing

c. Convert FIRMs and DFIRMs to Digital Format

FEMA, with input from the CTP, has identified the sequence of county map production in Illinois for the 5-year Map Modernization Program. Illinois has proposed certain changes to FEMA's list for FFY06 and beyond. If acceptable, these changes will result in adjustments to the sequencing plan contained in the Multi-Year Flood Hazard Implementation Plan.

Lead: SWS  
Timing: Years 1 through 5  
Funding: Years 1 through 5  
Staffing: Years 1 through 5



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## **2. Develop MIP Information**

DFIRM databases developed for each county will provide the basic input to the MIP. As information management and production tracking systems are introduced by FEMA they will be adopted. IDNR will submit revised standard DFIRM databases as new H&H is developed and approved, as well as updates on new base mapping. The updated DFIRMs would be distributed by FEMA.

Lead: SWS and OWR  
Timing: Year 2 and ongoing  
Funding: Year 2 and ongoing  
Staffing: Year 2 and ongoing

## **3. Help NFIP Communities Adopt the Countywide DFIRM2003's**

As existing paper maps and DFIRM95 digital files are converted to the DFIRM2003 format, FEMA and IDNR will orchestrate the acceptance and adoption of these revised maps by communities. There are over 800 communities participating in the National Flood Insurance Program in Illinois. The administrative effort, or new map implementation effort, will include scoping meetings with local officials, data collection, site inspections and verifications, review and incorporation of valid community concerns and revisions to the draft maps, internal coordination with mapping staff, letters of final determination, final meetings, ordinance updates and mailings, ordinance reviews, public hearings, tracking of map progress and coordination with local officials, and working with local officials to perform ongoing map maintenance.

Lead: OWR and SWS  
Timing: Year 2 and ongoing  
Funding: Initial and ongoing  
Staffing: Year 2 and ongoing

Community adoption of DFIRM2003 maps will begin in Year 2.

## **B. Phase II – Maintenance of Flood Map Data**

As stated in the goals and objectives on page 10, flood map modernization will allow Illinois to provide a consistent floodplain management program and foster better watershed management throughout the State.

FEMA has provided the states with a list of seven fundable Community Assistance Program Mapping (CAP-MAP) Phase II activities. Phase II activities such as hydrologic and hydraulic reviews and technical standards agreement are already in place at IDNR. The following discussion examines the feasibility of expanding the State's role as the FEMA MIP is further developed. However, the scope and extent of DFIRM maintenance, information technology systems, and outreach activities will not be clear until the MIP is developed and digital flood data maintenance procedures are defined by FEMA. Therefore, at this stage the Plan does not fully identify staffing and other resources that will be needed to carry out the activities.

### **1. Maintain the Statewide Digital Base Map Inventory**

GIS work being performed by Illinois counties will be monitored, along with the efforts of the Illinois State Geological Survey and the U.S. Geological Survey. IDNR will also monitor evolving

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MIP procedures for updating digital base map data in the DFIRM2003 format.

Lead: SWS  
Timing: Ongoing from Year 2  
Funding: Ongoing from Year 2  
Staffing: Ongoing from Year 2

## **2. Share Digital Base Maps**

IDNR will facilitate sharing digital base map data through a State-sponsored website and through professional organizations and meetings.

Lead: SWS  
Timing: Year 1 and ongoing  
Funding: None  
Staffing: Unknown

## **3. Maintain DFIRMs**

IDNR has an interest in maintaining the DFIRM maps at the state and community level so that it can provide up-to-date flood hazard information and support its regulatory floodplain program. While the department will use existing personnel for map maintenance, it assumes that additional staff will also be required for statewide maintenance. Until the frequency of maintenance and maintenance procedures have been proposed, IDNR cannot determine the total level of staffing required.

Lead: OWR  
Timing: Investigate in Year 3, Pilot in Year 4 and ongoing  
Funding: Years 3 and 4 and ongoing  
Staffing: Beginning in Year 3

## **4. Conduct Hydrologic and Hydraulic Reviews**

As discussed in Section I, IDNR conducts an H&H *review* of letters of map changes (LOMC). The department is interested in eliminating the duplication of effort of IDNR reviewers and FEMA contract reviewers. (IDNR does not charge fees for reviews or permits issued.) If FEMA makes procedural changes, IDNR would like to conduct the H&H reviews for LOMCs. Cost and staff estimates presented here are preliminary.

Lead: OWR  
Timing: Ongoing  
Funding: Beginning in Year 3  
Staffing: Additional personnel beginning in Year 3

## **5. Continually Assess Community Mapping Needs**

Illinois recognizes the need for better flood hazard maps for northeastern Illinois and other urban, and urbanizing areas of the state. Under Phase II, IDNR will periodically assess mapping needs statewide and submit data to FEMA to update the MNUSS database. It will monitor available base mapping, determine the need for improved H&H information, and gauge the ability of communities to assist with flood map maintenance tasks. This activity will be expanded from Phase I where mapping needs will be collected as part of scoping and will include results from the Best Practices Award grant which will establish a framework for determining where approximate A Zones should be defined.

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Lead: OWR  
Timing: Year 3 and ongoing  
Funding: Year 3 and ongoing  
Staffing: Year 3 and ongoing

#### **6. Technical Standards Agreement**

IDNR and FEMA signed a technical standards agreement in 1989 for the H&H *review* of requested letters of map changes. The current technical standards agreement addresses the additional State standards for activities in floodways and floodplains that exceed the minimum NFIP requirements. Should Illinois receive funding to *approve* letters of map changes, IDNR recommends expanding the existing agreement, without compromising adopted general standards of FEMA and IDNR, to address and resolve unique problems which may arise.

Lead: OWR  
Timing: Ongoing  
Funding: Additional funding would not be required for this activity; funding would be provided through H&H reviews or DFIRM Maintenance  
Staffing: None

#### **7. Information Technology Systems**

While it is not clear where MIP data will be stored or how it will be accessed, IDNR has an interest in participating in the information technology systems. At this time, the level of effort and facilities required from the department cannot be estimated. If appropriate, IDNR will pursue information technology resources within the State that are outside of the department

Lead: SWS and OWR  
Timing: Investigate in Year 5 and ongoing  
Funding: Unknown  
Staffing: Unknown

#### **8. Outreach**

IDNR's current outreach activities include websites, newsletter articles, brochures, and handbooks. Information is provided from the Floodplain Information Service upon request. An expanded outreach effort—in print, on the Internet, and in multi-media formats—will help both the IDNR and FEMA achieve their goals for flood map modernization.

The Illinois River Decision Support System (<http://ilrdss.sws.uiuc.edu>) is an example of a department website that uses ArcIMS, while ArcSDE is used for in-house information dissemination. Since IDNR has limited experience with multi-media approaches to outreach, this capability would need to be developed internally or through consultants. IDNR will investigate additional outreach methods to address community and other user needs. New efforts for website expansion will be done in coordination with the Illinois Governor's Office of Technology.

Lead: SWS and OWR  
Timing: Investigate in Year 5 and ongoing  
Funding: Unknown  
Staffing: Unknown

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## Section VI - Illinois Flood Map Modernization Plan

### A. Objectives

Based on the stated goals and the activities identified for flood map modernization, IDNR's objectives for the remaining years of the Map Modernization Program, with funding assistance from FEMA, are as follows:

1. Manage and convert base maps and flood hazard information into digital data for all Illinois counties for FEMA's Map Information Portal.
2. Provide administrative and technical support for community adoption of new DFIRM maps.
3. Assess community flood hazard mapping needs for the purpose of populating the MNUSS data base.
4. Maintain flood map data for the MIP and for base map data inventories and information sharing services.
5. Conduct H&H reviews and process letters of map changes.
6. Investigate and create a website-based outreach program that will help communities use flood maps and flood hazard data more effectively.

### B. Illinois' Multi-Year Work Plan (2007-2009)

The primary objective of this multi-year work plan is to identify base maps and prepare digital flood hazard data in the DFIRM geo-database format, and to maintain and update digital flood data as needed. This effort will involve the following major work tasks:

1. Develop a digital base map inventory;
2. Assess community mapping needs;
3. Convert existing FIRMS and older style DFIRMS to DFIRM2003 GIS format;
4. Provide existing and prepare new hydrologic and hydraulic data for selected counties;
5. Assist communities with DFIRM adoption by ordinance;
6. Investigate, pilot and implement map maintenance activities as a follow-on to Map Modernization.

Table 6 presents the work plan for Phase I and Phase II activities that Illinois will continue to implement with the support of FEMA funding. Costs and additional full-time employees (FTEs) that will be required are shown for each year.

The work plan is being conducted solely within IDNR. New employees have been hired and will continue to be hired by the SWS, through the University of Illinois, to compile the digital base map inventory, develop flood hazard data, and conduct H&H reviews. The OWR has added staff to perform project management, scoping duties, FIS preparation and post-preliminary processing activities. Additional staff will be added as necessary to meet work loads. If it is determined that the objectives of the Work Plan cannot be met in the timeframe presented, IDNR may out-source work to consultants to allow for the most efficient use of time and staff.

Table 6 shows a timeline for the work plan. Total cost estimate (at full funding) is shown at the bottom of each year.

**Table 6.  
Illinois Flood Map Modernization Work Plan**

<b>Year</b>	<b>Phase I Activities:</b>	<b>Phase II Activities:</b>	<b>FTE* and Total Cost</b>
<b>1</b>	<ul style="list-style-type: none"> <li>• Assessment of Community Mapping Needs</li> <li>• Development of Statewide Digital Base Map Inventory: DOQs, county mapping programs, city mapping programs</li> <li>• Advertise, interview, hire, and train staff</li> <li>• Purchase equipment and prepare space</li> <li>• Upgrade existing DFIRMS to DFIRM geo-database format for 5 counties</li> <li>• Hydrologic and hydraulic review/update for 2 counties</li> </ul>	<ul style="list-style-type: none"> <li>• Ongoing IDNR efforts:               <ul style="list-style-type: none"> <li>○ Hydrologic and hydraulic review for map changes</li> <li>○ Development of new H&amp;H</li> <li>○ Implementation of current technical standards agreement</li> </ul> </li> </ul>	Projected: 18 Actual: 9
	Projected Cost: \$3,600,000 Actual funding: \$1,135,000	Cost: \$ (ongoing)	1,135,000
<b>2</b>	<ul style="list-style-type: none"> <li>• Continue Assessment of Community Mapping Needs</li> <li>• Continue conversion of DFIRMS and paper maps to geo-database DFIRMS</li> <li>• Conduct quality reviews of developed DFIRM2003s</li> <li>• Provide digital data to MIP</li> <li>• Develop website posting of preliminary DFIRMS</li> <li>• Continue to advertise, interview, hire, and contract staff</li> <li>• Hydrologic and Hydraulic review/update for 2 counties</li> <li>• Begin post-preliminary activities leading to community adoption of FFY04 countywide maps</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain Statewide Digital Base Map Inventory</li> <li>• Develop Outreach Capabilities</li> <li>• Ongoing IDNR efforts</li> </ul>	Projected: 31 Actual : 27
	Projected Cost: \$5,170,000 Actual funding: \$3,184,585	Cost: \$60,000	3,224,585

*\*Estimate of FTEs does not include the estimate of part-time student employees for Phase I activities. A budget for hiring part-time students, however, is included in the cost estimates.*

**Table 6. – Continued  
Illinois Flood Map Modernization Work Plan**

<b>Year</b>	<b>Phase I Activities:</b>	<b>Phase II Activities:</b>	<b>FTE* and Total Cost</b>
<b>3</b>	<ul style="list-style-type: none"> <li>• Continued development of DFIRM2003s for 20 counties</li> <li>• Conduct quality reviews of developed DFIRM2003s</li> <li>• Provide digital data to MIP</li> <li>• Place preliminary DFIRMS on website for community review</li> <li>• Continue post-preliminary review and adoption of maps</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain Statewide Digital Base Map Inventory</li> <li>• Maintain Assessment of Community Mapping Needs</li> <li>• Investigate DFIRM2003 maintenance</li> <li>• Ongoing IDNR efforts</li> </ul>	Projected: 40 Actual: 36.8
	Projected Cost: \$4,650,000 Actual Cost: \$2,884,000	Cost: \$480,000 Best Practices Award: \$70,022	5,130,000
<b>4</b>	<ul style="list-style-type: none"> <li>• Continued development of DFIRM2003 for counties projected in the MHIP</li> <li>• Conduct quality reviews of developed DFIRM2003s</li> <li>• Place preliminary DFIRMS on website for community reviews</li> <li>• Provide digital data to MIP</li> <li>• Continue post-preliminary review and adoption of maps</li> </ul>	<ul style="list-style-type: none"> <li>• Pilot DFIRM2003 maintenance</li> <li>• Maintain Statewide Digital Base Map Inventory</li> <li>• Maintain Assessment of Community Mapping Needs and Capability</li> <li>• Ongoing IDNR efforts</li> </ul>	Projected 41
	Projected Cost: \$4,650,000	Cost: \$620,000	5,270,000
<b>5</b>	<ul style="list-style-type: none"> <li>• Continued development DFIRM2003</li> <li>• Conduct quality reviews of developed DFIRM2003</li> <li>• Place preliminary DFIRMS on website for community reviews</li> <li>• Provide digital data to MIP</li> <li>• Continue post-preliminary review and adoption of maps</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct DFIRM maintenance</li> <li>• Maintain Statewide Digital Base Map Inventory</li> <li>• Maintain Assessment of Community Mapping Needs</li> <li>• Investigate base map sharing</li> <li>• Investigate Information Technology Systems</li> <li>• Ongoing IDNR efforts</li> <li>• Investigate outreach mechanisms</li> </ul>	Projected 41
	Projected Cost: \$4,650,000	Cost: \$620,000	5,270,000

*\*Estimate of FTEs does not include the estimate of part-time student employees for Phase I activities. A budget for hiring part-time students, however, is included in the cost estimates*

**Table 6. – Continued  
Illinois Flood Map Modernization Work Plan**

Year	Phase I Activities:	Phase II Activities:	FTE* and Total Cost
<b>Post 5</b>		<ul style="list-style-type: none"> <li>• Conduct quality reviews of developed DFIRM2003</li> <li>• Provide digital data to MIP</li> <li>• Continue community adoption of DFIRM 2003 process</li> <li>• Conduct DFIRM maintenance</li> <li>• Maintain Statewide Digital Base Map Inventory</li> <li>• Maintain Assessment of Community Mapping Needs</li> <li>• Provide base map sharing</li> <li>• Ongoing IDNR efforts</li> <li>• Conduct outreach</li> <li>• Retain one GIS manager and one engineer and proportional support staff to process map revisions, maintain inventory, hire graduate and undergraduate students as needed for work load.</li> </ul>	15
	Cost: \$0	Cost: \$1,400,000	\$1,400,000

*\*Estimate of FTEs does not include the estimate of part-time student employees for Phase I activities. A budget for hiring part-time students, however, is included in the cost estimates.*

**Table 7.  
Illinois five-year Flood Map Modernization Timeline**

	Lead	Year 1	Year 2	Year 3	Year 4	Year 5	Post Year 5
<b>Phase I - Development of Digital Map Information:</b>							
Assessment of Community Mapping Needs	OWR	*****	*****	*****	*****	*****	*****
Development of digital base map inventory	SWS	*****	*****				
Advertise, interview, and hire staff	OWR/SWS	*****	*****	*****			
Conversion of counties to DFIRM2003 geo-database format	SWS	*****	*****	*****	*****	*****	
New H&H for FEMA selected counties	SWS	*****	*****				
Post preliminary maps to State web site for review and comment	SWS		*****	*****	*****	*****	
Community Adoption of DFIRM2003 maps	OWR		*****	*****	*****	*****	*****
Uploading of final DFIRM2003 maps to MIP	SWS		*****	*****	*****	*****	*****
<b>Phase II - Map Modernization Maintenance Activities</b>							
Statewide Digital Base Map Inventory- Maintain	SWS			Investigate	*****	*****	*****
Digital Base Map Sharing (ISWS and OWR)	SWS					Investigate	*****
DFIRM Maintenance	OWR/SWS			Investigate	Pilot	*****	*****
Hydrologic and Hydraulic Review	OWR	*****	*****	*****	*****	*****	*****
Assessment of Community Mapping Needs	OWR			*****	*****	*****	*****
Technical Standards Agreement	Done	*****	*****	*****	*****	*****	*****
Information Technology Systems	OWR/SWS					Unknown	*****
Outreach - Website Posting & Informational Mailing	OWR/SWS					Investigate	*****
Outreach - Multi-Media Promotional Activities	OWR/SWS					Investigate	*****
<b>Total Funding Request:</b>		<b>\$ 1,135,000</b>	<b>\$ 3,184,585</b>	<b>\$2,884,000</b>	<b>\$ 5,270,000</b>	<b>\$ 5,270,000</b>	<b>\$ 1,400,000</b>

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## C. Coordination with Cooperative Technical Partners and Communities

IDNR will continue to work cooperatively with the current CTP communities and counties, but will assume quality control for maps produced by current or future CTPs and FEMA contractors working in Illinois on map conversions. The department will review data provided by counties and communities to determine if it meets data specifications. When specifications are met, or when the data can be improved to meet standards, the product will be incorporated under map conversion or maintenance activities.

## D. Cost-share

IDNR is able to provide cost-share for the following:

- Staff to review and issue CLOMRs (duplication of effort by FEMA will be removed),
- H&H studies funded by IDNR,
- Floodplain Information Services staff,
- Office space/physical plant,
- Telephone and office equipment, and
- Supervisory and administrative support.

## E. Project Management

### Administration

IDNR will use existing administrative arrangements to manage any new or amended contracts with FEMA.

### Personnel and Training

IDNR will implement the multi-year work plan; managers at OWR and SWS will supervise project development, work effort, hiring, performance standards, and quality assurance. A Map Modernization Project Manager will manage the project.

All personnel will be technically qualified and IDNR will provide comprehensive training for both existing and new staff. Staff will attend training offered by FEMA, or recommended by FEMA, relating to flood map modernization.

Contracts with any consultants will be based on qualifications and will be implemented through IDNR's required procedures.

### Quality Assurance and Performance Standards

Products in the work plan will be developed according to FEMA specifications and standards, and IDNR will develop a procedure for independent review of flood map data. The department will meet with FEMA staff as well as internal staff to review deliverables and QA/QC procedures.

Table 8 summarizes the number of counties and the percent of the State's population that will have preliminary DFIRM2003's ready for review at the end of each year. If it is determined that objectives cannot be met in the timeframe presented, e.g., due to delays in hiring qualified staff, IDNR may out-source work to consultants.

<b>End of Year</b>	<b># Counties with DFIRM2003</b>	<b>Percent of Population</b>
1	4	13.1%
2	22	67.4%
3	45	82.4%
4	73	93.6%
5	102	100.0%

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Performance standards will be established for activities such as assisting communities adopt new maps; these will be modeled after the Community Assistance Program.

**Tracking and Reporting**

IDNR anticipates reporting to FEMA monthly and quarterly. Monthly reports will track the status of DFIRM panel production. Quarterly reports will show the status of all other map modernization activities.

**F. FEMA-Requested Funding Scenarios**

At FEMA’s request, the following funding scenarios are included in Illinois’ State Business Plan:

**Full Funding:** Illinois’ full work plan (Table 6) provides a “full funding” proposal for flood map modernization in Illinois.

**Medium Funding:** IDNR would undertake all plan activities but the completion timeline would be extended depending on the reduction.

**Low Funding:** IDNR would implement the activities for map maintenance. No map conversion would be completed unless a separate CTP was funded by FEMA.

**No Federal Funding:** If no federal funding is available, IDNR will complete the current activities in the map maintenance area. These capabilities will include maintenance of digital products as they are introduced in Illinois.

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## Section VII - Conclusions and Recommendations

### A. Conclusions

In this State Business Plan update, IDNR has reiterated how it will participate in FEMA's Flood Map Modernization Program. The cooperative effort between the state and FEMA will:

- Develop up-to-date-flood hazard data.
- Provide maps and data in digital format.
- Integrate Illinois and its communities into the mapping process.
- Reduce or eliminate inconsistencies in flood hazard mapping.
- Foster better watershed management throughout Illinois.
- Incorporate better flood data and base mapping into regulatory flood maps.
- Reduce or eliminate duplication of federal and state effort in flood map maintenance.

Progress has been demonstrated by the CTP with respect to many of the objectives identified in this Business plan. For instance, the development of a digital base map inventory as well as the next generation of higher resolution base maps; assessment of community mapping needs for the FFY04 and FFY05 counties and conversion of maps to a DFIRM2003 GIS format; review and updating of H&H data for 2 counties (Cook and Kendall) as a prelude to map conversions; and development of a web site for posting of preliminary DFIRMS and FIS reports. Several FFY04 and FFY05 counties are at or nearing the point of preliminary map and FIS distribution. Despite start-up delays and the programmatic issues identified in Section IV, mapping is being delivered. The CTP is undertaking 19 more counties in FFY06. As of the writing of this report update in October 2006, project team and scoping meetings have been held in 10 of the 19 counties. For the most part, the CTP's vision of what it hopes to accomplish with FEMA's assistance is coincident with previous plan iterations.

### B. Funding Request

The IDNR continues to request full funding of its business plan. While this plan update projects the total cost of map conversion to be less than initial and subsequent estimates made by the CTP, funding assistance levels contained in the MHIP continue to be lower as well. In the September 2006 Multi-Year Flood Hazard Implementation Plan, the total estimated expenditure for the Illinois CTP is listed at \$12,978,000 not including \$550,000 for H&H work in the first two years. This figure is only 78% of Illinois' estimated cost to complete map conversion and is only 66% of the funding requested in this plan when Phase II and follow-on maintenance activities are included in the budget.

DNR is dedicated to improving the quality of floodplain mapping in the state and seeks to produce maps that are consistent with the best available base map information and the new Floodway Boundary Standard. Our current experience has shown that this often requires labor intensive refitting (registration) of flood layers to higher resolution and more accurate orthophoto base maps and topography. This additional time and cost, and the time and cost of reviewing community and county level H & H studies that have not been officially adopted, as well as the time and cost of incorporating standards and procedures into the process that are still being developed by FEMA continue to push the cost of map modernization higher.

While we hope that the project develops significant cost efficiencies as it moves forward the funding

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levels contained in the MHIP must continue to be scrutinized. If under-funding becomes an obstacle to the accurate conversion, updating, and improvement of existing maps, Illinois will have to revise its business plan commensurate with funding levels. Moreover, the lack of any identifiable funding in the MHIP for map maintenance activities is troubling. Follow-on activities must be investigated and piloted before the end of Map Modernization so that the transition to the map maintenance phase is smooth. The institutional knowledge, data resources, and partner relationships acquired during Map Modernization must not be lost due to a gap in funding. Finally, several risks to program completion are identified in this plan. These must be discussed with our Federal partner and resolved if progress is to be continued.

The Office of Water Resources and the State Water Survey have historically produced high quality floodplain information for the citizens of Illinois. Full funding of this business plan is necessary to continue this tradition and to help FEMA meet its key indicators for map modification.

### C. Proposed Schedule

In conjunction with other mapping efforts outside of the Illinois CTP, full funding of this plan will permit the development of digital base map and flood hazard data for 82 percent of the state's population (39 counties) at the end of 3 years and 100 percent by the end of the fifth year. The proposed schedule is presented in Table 7.

### D. Notice of Interest

The updated Business Plan for Flood Map Modernization serves as Illinois' "notice of interest" to continue its participation in the Federal Emergency Management Agency's (FEMA) Flood Map Modernization Program.

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## References

*Illinois Map Modernization Plan*, 2002 (Dewberry)

*Floodplain Management – Local Administrator’s Manual*, IDNR/OWR, January 1996

*Floodplain Management in Northeastern Illinois – Local Administrator’s Manual*, IDNR/OWR, December 1996

“Statewide Survey of GIS Development in Illinois Counties” (Figures 1 and 2), City of Danville, Vermillion County, Illinois Department of Development Services, GIS Division, Adam Aull, GIS Manager.

FEMA Website for Flood Hazard Mitigation and Map Modernization Program ([www.fema.gov/fhm/](http://www.fema.gov/fhm/)).

United States Geological Survey National Hydrography Database ([nhd.usgs.gov/](http://nhd.usgs.gov/)).