

Map Modernization Plan for State of Indiana

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Mapping Plan for State of Indiana

Executive Summary

The proposed mapping plan meets FEMA's Government Performance and Results Act (GPRRA) goals, as follows:

1. The average age of the maps in Indiana will be reduced to 5.8 years by the end of Fiscal Year (FY) 2006 with only FY 2003 funding;
2. Over half (55.4%) of the State's unmapped communities will receive maps;
3. Fifteen percent of the State's highest priority mapping needs will receive new detailed hydrologic and hydraulic analyses; and
4. State and non-FEMA cost share (including in-kind contributions) will reach 20%.

The total cost of the plan is approximately \$7.1 million. The FEMA share is \$5.9 million.

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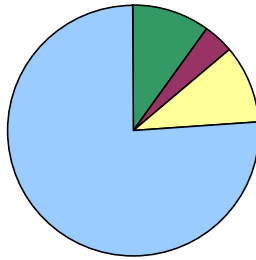
Appendices

- Appendix A – MNUSS Call Template
- Appendix B – Summary of MNUSS Data Collected

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Background and Purpose of Plan

The Federal Emergency Management Agency's (FEMA's) flood hazard maps are essential tools for flood hazard mitigation in Indiana and in the United States in general. As shown in the figure below, most of the flood hazard maps in Indiana have become outdated.



Age of Effective Map Panels



In many cases, the older maps reflect outdated flood hazard information that limits their utility for insurance and floodplain management purposes. Additionally, most of the maps were prepared using now outdated road network information and manual cartographic techniques, which make the maps difficult for State and local customers to use and expensive for FEMA and the Indiana to maintain. In addition, FEMA has estimated that there are 195 communities in Indiana where flood hazard maps have not been produced.

To address this problem, the President's budget for Fiscal Year (FY) 2003 (which starts on October 1, 2002) includes \$351 million for initiating FEMA's national Map Modernization Program. Similar funding levels are proposed for subsequent fiscal years.

This Plan was prepared to assist FEMA in the development of regional and national plans for implementing the FEMA Map Modernization Program. This Plan summarizes the role that Indiana will play in completing the required mapping activities and how these activities will be managed and performed. This Plan identifies mapping priorities, explains how mapping priorities were established for each county in Indiana, and outlines an approach for addressing these mapping priorities.

In accordance with Government Performance and Results Act (GPRA) performance measures suggested for the Map Modernization Program by the Office of Management and Budget, the details of this Plan have been developed with consideration given to FEMA accomplishing the following nationwide goals:

- Reducing the average age of the flood maps nationwide from over 14 years to 6 years or less;
- Producing digital flood hazard maps with up-to-date flood hazard data for the 15-percent highest priority areas; and

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- Developing flood hazard maps for one-half of the unmapped, floodprone communities.

State Role in the Flood Hazard Mapping Program

The State of Indiana plans to assist in the Flood Hazard Mapping Program in a Mid-Level Participation as defined below.

Mid-Level Participation—The State will perform a majority of the mapping needs assessments and assist with outreach and community coordination on mapping projects. However, the State will not manage or perform any flood mapping activities. All mapping activities will be managed by the Regional Office based on input provided by the state.

The Indiana Department of Natural Resources, Division of Water (IDNR), the State's National Flood Insurance Program (NFIP) coordinating agency, will take the lead in the State of Indiana for the floodplain mapping program. The Fiscal Year (FY) 2003 plan will be managed by the FEMA Region V office and will rely primarily on a mix of local and regional government agencies through the Cooperating Technical Partners (CTP) program, IDIQ study contracts, and Flood Map Production Coordination Contractor (MCC) work. IDNR will assist throughout via input in the scoping process, by supplying data, assisting with outreach activities, establishing State-specific engineering and mapping standards, reviewing the preliminary map products, etc.

There are existing CTP agreements with the City of Indianapolis and Maumee River Basin Commission (MRBC). The MRBC has jurisdiction over all or part of five counties (Noble, Steuben, Allen, Adams, and DeKalb). In addition, preliminary negotiations for CTP agreements have taken place with Porter, Tippecanoe, Boone, Madison, Bartholomew, and Shelby Counties.

Mapping Needs Assessment and Priority Setting Approach

The IDNR, Division of Water, performed an internal analysis of counties in Indiana to determine candidates for restudy priorities. This analysis consisted of ranking counties based on:

- Population
- Number of flood insurance policies in the county
- Number of Construction in a Floodway permit applications the Division had received over the last year (2001)
- Number of requests for "Floodplain Analysis and Regulatory Assessment" letters the Division had received over the last year (2001)
- Age of the maps for the county

Also taken into account for FY 2003 priorities was choosing an equal number of counties in each of the three IDNR basin teams (North, Central, and South) so that one basin team would not be overburdened with restudy commitments.

The IDNR, with the support of one of the MCCs, conducted telephone interviews with 37 communities. Copies of the documents used for the data collection and outreach activities (e.g., questionnaires) are included in Appendix A. (These telephone interviews were continuing at the time of the preparation of this report.)

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The State of Indiana has a good grasp of its mapping needs because (1) they have an active floodway construction permit program, (2) they take a lead on their NFIP Community Assistance Visits, and (3) they have a state association for floodplain management.

A complete listing of the MNUSS data collected for Indiana is provided in Appendix B.

Upon completion of the mapping needs assessment, the IDNR ranked each county to determine the order in which the counties' mapping needs should be addressed. Priority was given to (1) Lake County (because of its proximity to Chicago with its ongoing high level of development, and because there is an ongoing U.S. Army Corps of Engineers [USACE] project), (2) existing CTPs (City of Indianapolis and MRBC), (3) potential CTPs, (4) Indianapolis metropolitan area counties, (5) Ohio River counties, and (6) counties with the oldest maps in the State. The results of the ranking and priority-setting process are summarized in Table 1.

The resulting plan achieves the GPRA goal of reducing the age of the maps to 5.8 years and provides maps for 55% of the unmapped communities in Indiana.

Proposed Approach to Addressing Mapping Needs

To address the prioritized mapping needs, the IDNR evaluated the map production options that are available. For the purposes of this Plan, the options have been categorized as Level 1 Map Upgrades and Level 2 Map Upgrades. A brief description of each is provided below.

- **Level 1 Map Upgrades:** Level 1 Map Upgrades are improvements to existing flood maps that do not include significant changes to Base Flood Elevations (BFEs). These improvements may include converting the flood maps to a GIS-based digital format (or upgrading to current digital FIRM standards if already in old digital FIRM format), development of a standard DFIRM database, incorporating an improved base map (such as digital orthophoto quarter quadrangles), redelineating existing floodplain boundaries based on updated topographic data, refinement or addition of Zone A, and correction of mismatches in flood hazard information (floodplains, floodways, BFEs) across community and county borders..
- **Level 2 Map Upgrades:** Level 2 Map Upgrades include all of the features of Level 1 Upgrades plus include significant changes to BFEs. Significant changes to BFEs can result from revisions to existing BFEs or establishing new BFEs in areas that were unstudied or approximately studied. They can be based on a new detailed restudy performed by a Mapping Partner or an existing data source, such as an old U.S. Army Corps of Engineers floodplain information report (commonly referred to as an Existing Data Study or "XDS"). These upgrades typically require updated topographic data, structure and cross-section surveys, hydrologic and hydraulic engineering analyses, and floodway and floodplain boundary delineation.

The costs associated with Level 2 map upgrades typically will be significantly higher than the costs associated with Level 1 map upgrades.

The IDNR then evaluated various scenarios to determine the best combination of the above activities to achieve the GPRA performance measures. Based on this evaluation, the IDNR submitted the highest priority recommendations shown in Table 1 to FEMA. For the purposes of this plan, the IDNR assumes that the 15% highest priority mapping needs in the State are met under this plan.

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Table 1 – Map Production Summary for FY 2003 Funding

County	Planned Community Upgrades			Average Age of Maps by FY 2006	Unmapped Communities To Be Mapped by FY 2006
	Level of Upgrade	No. of Communities	No. of Panels		
Bartholomew	1		32		
	2		11		
	Total	7	43	0.5	4
Benton	1		20		
	2		0		
	Total	6	20	0.5	5
Boone	1		33		
	2		12		
	Total	4	45	0.5	0
Cass	1		21		
	2		0		
	Total	3	21	0.5	1
Clark	1		26		
	2		0		
	Total	7	26	0.5	
Clay	1		15		
	2		0		
	Total	8	15	0.5	7
Crawford	1		25		
	2		0		
	Total	7	25	0.5	1
Daviess	1		23		
	2		0		
	Total	6	23	0.5	4
Dearborn	1		21		
	2		0		
	Total	8	21	0.5	3
Dubois	1		40		
	2		0		
	Total	6	40	0.5	2
Floyd	1		28		
	2		0		
	Total	3	28	0.5	0
Gibson	1		26		
	2		0		
	Total	11	26	0.5	6

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County	Planned Community Upgrades			Average Age of Maps by FY 2006	Unmapped Communities To Be Mapped by FY 2006
	Level of Upgrade	No. of Communities	No. of Panels		
Greene	1		22		
	2		0		
	Total	7	22	0.5	3
Hancock	1		48		
	2		0		
	Total	6	48	0.5	3
Harrison	1		34		
	2		0		
	Total	10	34	0.5	4
Hendricks	1		56		
	2		0		
	Total	10	56	0.5	6
Jay	1		20		
	2		0		
	Total	6	20	0.5	3
Jefferson	1		50		
	2		0		
	Total	4	50	0.5	0
Johnson	1		51		
	2		0		
	Total	8	51	0.5	1
Lake	1		96		
	2		0		
	Total	20	96	0.5	1
Madison	1		30		
	2		10		
	Total	12	40	0.5	4
Marion	1		96		
	2		0		
	Total	15	96	0.5	13
Noble	1		52		
	2		0		
	Total	7	52	0.5	3
Ohio	1		8		
	2		0		
	Total	2	8	0.5	0
Orange	1		18		
	2		0		
	Total	4	18	0.5	0

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County	Planned Community Upgrades		Average Age of Maps by FY 2006	Unmapped Communities To Be Mapped by FY 2006
	Level of Upgrade	No. of Communities		
Parke	1		23	
	2		0	
	Total	7	23	0.5
Perry	1		21	
	2		0	
	Total	4	21	0.5
Porter	1		36	
	2		12	
	Total	12	48	0.5
Posey	1		20	
	2		0	
	Total	5	20	0.5
Shelby	1		31	
	2		11	
	Total	3	42	0.5
Spencer	1		20	
	2		0	
	Total	7	20	0.5
Steuben	1		15	
	2		0	
	Total	6	15	0.5
Sullivan	1		25	
	2		0	
	Total	7	25	0.5
Switzerland	1		20	
	2		0	
	Total	3	20	0.5
Tippecanoe	1		33	
	2		11	
	Total	7	44	0.5
Warrick	1		26	
	2		0	
	Total	6	26	0.5
Washington	1		24	
	2		0	
	Total	7	24	0.5

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County	Planned Community Upgrades			Average Age of Maps by FY 2006	Unmapped Communities To Be Mapped by FY 2006
	Level of Upgrade	No. of Communities	No. of Panels		
Total	1		1185		
	2		67		
	Total	261	1252	5.8	99
Total (Including Studies in Progress)	1		1420		
	2		67		
	Total	296	1487	5.8	108

Proposed Approach To Map Production

To achieve GPRA goals for the State of Indiana, a total of 36 digital countywides resulting in 1,252 panels will need to be produced. The required number of panels was estimated in two steps, as follows:

(1) Dewberry & Davis LLC developed a spreadsheet tool called Mapping Project Planner (MP2). This tool was designed to perform many tasks, including determining the panel count based on percentages of various scale panels required for future level 1 upgrades. As an example, for Clark County, IN, MP2 determines that if this county were to be redone at all 1 inch equals 500 scale panels, it would result in 136 panels. If it were done at all 1 inch equals 1,000 scale panels, it would result in 40 panels. If it were done at all 1 inch equals 2,000 scale panels, it would result in 12 panels.

(2) In consultation with IDNR staff, we determined the appropriate combination of scales for each county. For example, based on level of development, it was determined that, for Clark County, a combination of 50% 1,000 scale panels and 50% 2,000 scale panels is appropriate. This resulted in a panel count of 26.

Mapping activities will be managed by FEMA Region V staff. IDNR will be involved through scoping, data gathering, quality reviewing, and outreach activities.

Level 1 upgrades will be performed by IDIQ contractors and processed by the MCC. Level 2 upgrades will be performed by a combination of IDIQ and CTP contractors. Existing flood studies will be used extensively, including Ohio River analyses performed by the USACE, Louisville District, and the Little Calumet River Levee project in Lake County.

Cost share requirements will be met primarily through the following:

(1) All current and proposed CTPs are assumed to provide 25% of the processing costs through a combination of data sharing and in-kind services. Initial conversations with CTPs by IDNR staff led to this assumption.

(2) Contributions by IDNR staff in data gathering, quality reviewing, and outreach activities need to be recognized as "in-kind" services in support of this plan. Therefore, a 5% contribution on the processing of all Level 1 studies was assumed.

(3) The planned use of digital orthophoto quadrangle (DOQ) maps for base maps represents a contribution from FEMA's mapping partner, the U.S. Geological Survey (USGS). A unit cost of \$430 per panel is built into the overall unit costs for Level 1 map production provided by FEMA for use in

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development of these plans. Therefore, this unit cost was multiplied by the number of panels per county and added into MP2 as a partner contribution for Level 1 upgrades.

(4) Existing studies to be incorporated, including the Ohio River study, and IDNR studies have been assumed to be counted against data sharing for flood theme upgrades. *The Ohio River study is a \$100,000 study and was cost shared 50-50 with the State of Indiana. The results are expected by the end of Calendar Year 2002.*

(5) IDNR plans to contract with their State Penal Industry to perform digitization of flood insurance data (similar to a recent project by the State of Ohio). The contract amount of \$90,000 is assumed to be used against the cost-share requirement.

(6) The Little Calumet River Levee project in Lake County, IN, is resulting in Level 2 upgrade in Lake County. This is an Illinois and Indiana project carried out by the USACE, Chicago District, and has been initiated in FY02. However, \$300,000 from FY03 is required to fund the remainder of this project. How to recognize the significant contributions of the USACE, Chicago District, for the Lake County portion of the FY03 plan has not been determined.

Cost share items (1), (2), and (3) have been added to MP2 and result in a cost-share contribution of 16.7%. For the purpose of this plan, it will be assumed that items (4), (5), and (6) will help the State of Indiana reach their GPRA goal of a 20% match of these funds.

Estimated Costs to Complete Proposed Mapping Activities

The activities to be performed by the State are estimated to cost approximately \$7.09 million. Approximately \$5.89 million of this amount will be provided by FEMA to the State, and the State will provide a match of 12 percent, or about \$1.20 million, through both in-kind and cash contributions. The costs for each county are listed in Table 2. The unit costs that were used in preparing these estimates came from FEMA Headquarters, as follows:

Per panel costs:

	Regional Flood Data Updates	National Processing and Coordination
Level 1	\$2,100*	\$4,650
Level 2	\$16,250	\$6,650

*This unit cost was applied only to Level 1 panels with revised flood theme data.

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Table 2 – Estimated Costs of Planned Production

County	Level 1 Upgrade Panels	Level 2 Upgrade Panels	FEMA Contribution (\$Millions)	State and Partner Contribution (\$Millions)	Total Cost
Bartholomew	32	11	0.327	0.074	0.401
Benton	20	0	0.080	0.013	0.093
Boone	33	12	0.351	0.078	0.428
Cass	21	0	0.084	0.014	0.098
Clark	26	0	0.127	0.017	0.144
Clay	15	0	0.060	0.010	0.070
Crawford	25	0	0.106	0.017	0.123
Daviess	23	0	0.092	0.015	0.107
Dearborn	21	0	0.084	0.014	0.098
Dubois	40	0	0.160	0.026	0.186
Floyd	28	0	0.124	0.019	0.143
Gibson	26	0	0.104	0.017	0.121
Greene	22	0	0.088	0.015	0.102
Hancock	48	0	0.191	0.032	0.223
Harrison	34	0	0.165	0.023	0.188
Hendricks	56	0	0.223	0.037	0.260
Jay	20	0	0.080	0.013	0.093
Jefferson	50	0	0.220	0.033	0.253
Johnson	51	0	0.203	0.034	0.237
Lake	96	0	0.300	0	0.300
Madison	30	10	0.300	0.069	0.369
Marion	96	0	0.293	0.153	0.446
Noble	52	0	0.159	0.083	0.242
Ohio	8	0	0.032	0.005	0.037

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County	Level 1 Upgrade Panels	Level 2 Upgrade Panels	FEMA Contribution (\$Millions)	State and Partner Contribution (\$Millions)	Total Cost
Orange	18	0	0.072	0.012	0.084
Parke	23	0	0.092	0.015	0.107
Perry	21	0	0.107	0.014	0.121
Porter	36	12	0.360	0.082	0.442
Posey	20	0	0.097	0.013	0.110
Shelby	31	11	0.324	0.072	0.396
Spencer	20	0	0.101	0.013	0.114
Steuben	15	0	0.046	0.024	0.070
Sullivan	25	0	0.100	0.016	0.116
Switzerland	20	0	0.101	0.013	0.114
Tippecanoe	33	11	0.330	0.075	0.405
Warrick	26	0	0.120	0.017	0.137
Washington	24	0	0.096	0.016	0.112
Total	1,185	67	5.894	1.195	7.089