

## 1.0 INTRODUCTION

Floods cause more damage and economic losses in the United States than any other type of natural disaster. During the 10 years from fiscal year (FY) 92 through FY01, flooding caused more than 900 deaths and more than \$55 billion in damages. For decades, the national response to flood disasters generally was limited to flood control works such as levees and dams, and providing disaster relief to flood victims. While helpful, this approach has not done enough to reduce losses or discourage unwise development. In fact, in some instances, it may have encouraged additional development. To compound the problem, the public often could not buy flood coverage from insurance companies, and building techniques that could reduce flood damage often were

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overlooked. In the face of mounting flood losses and escalating disaster relief costs to the general taxpayer, the U.S. Congress created the National Flood Insurance Program (NFIP).

The Federal Emergency Management Agency (FEMA) is the Federal agency with primary responsibility for assisting local and State governments, private entities, and individuals in preparing for, mitigating, responding to, and recovering from natural disasters, including floods. The NFIP is the key component of FEMA's efforts to minimize or mitigate the damage and financial impact of floods on the public, and to limit Federal expenditures needed after floods occur.

The NFIP's objectives are to reduce flood damages and provide an insurance mechanism for those most in need of protection. To that end, FEMA has been identifying and assessing flood hazards, providing Special Flood Hazard Area (SFHA) information on maps, and setting national floodplain management requirements that are adopted and enforced by communities choosing to participate in the NFIP. Minimizing the flood risk for new and existing development has protected citizens' lives, property, and personal finances.

Currently, many people within the United States live along streams, coasts, or lakes for which flood hazards have not been identified on maps, or where the maps are dated and do not accurately portray existing flood hazards. The flood hazard map panel inventory is currently being updated. With anticipated 5 years of funding (FY04-FY08), FEMA has embarked on an effort to update the Nation's flood maps through Flood Map Modernization. The Multi-Year Flood Hazard Identification Plan (MHIP) is a roadmap that defines how FEMA will produce updated, digital flood-hazard data for the United States.

## 1.1 MHIP Benefits

FEMA currently has an inventory of more than 90,000 Flood Insurance Rate Map (FIRM) panels (including index panels) in various formats. With continued presidential and congressional support, FEMA will produce updated digital data for all areas of the Nation with flood risk.

The complexity of this task requires a detailed plan for performance, schedule, and cost. This MHIP update presents FEMA's plan for accomplishing the Digital Flood Insurance Rate Map (DFIRM) production activities of Flood Map Modernization. The MHIP provides:

- A 5-year (FY05-FY09) sequence for DFIRM production based on anticipated funding for Flood Map Modernization
- A planning tool to enable all stakeholders to anticipate future workload requirements such as new flood zone determinations and ordinance adoptions
- A long-term vision to support the decision-making processes of local, State, and regional community partners
- A flexible tool that will allow FEMA and its partners to balance national goals and local mapping needs
- An input process that maximizes stakeholder involvement and clear communication (to maintain stakeholder awareness of the planning effort and encourage partners' participation and contributions)
- A methodology for funding distributions
- Planned costs and schedules for current and future map updates for counties, parishes, independent cities, and territories where there is flood risk
- A dynamic method to revise scheduling for flood map production for studies funded through FY08 (completed through FY10)
- A mechanism for clear reporting of progress for greater accountability
- An approach for establishing, based on the level of risk, the appropriate level of detail, accuracy, and analysis required to produce reliable maps (see section 7 of the FY04-FY08 MHIP [Version 1.0], November 2004)

## 1.2 National Flood Insurance Program Background

Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program that enables property owners in participating communities to purchase insurance as a protection against flood losses, in exchange for community and State commitments to establish and implement floodplain management regulations targeted at reducing future flood damages.

Participation in the NFIP is voluntary and based on an agreement between communities and the Federal government. If a community adopts and enforces a floodplain management ordinance to

reduce future flood risk to new construction in floodplains, the Federal government makes flood insurance available within the community. This insurance provides an alternative to disaster assistance and reduces the taxpayer burden of escalating costs for repairing flood damage to buildings and their contents by sharing the risk among policyholders.

Since its inception, the NFIP has sought to minimize flood-related property losses by making flood insurance available on reasonable terms and encouraging its purchase by people who need insurance protection. The NFIP identifies and maps flood-prone areas, makes flood insurance available to property owners in the more than 20,000 communities that currently participate in the program, and requires participating communities to enact floodplain management measures to mitigate flood hazards. In the early 1990s, FEMA began to collect data and information to develop flood maps in digital format. In 1994, the President issued Executive Order 12906, which mandated that standards for digital geographic data be applied uniformly throughout the Federal government. Anticipating that electronic data would soon become the standard vehicle for information delivery, and in an attempt to make flood map production more cost-effective and efficient, FEMA developed a prototype digital flood map.

In 1997, FEMA developed its initial Flood Map Modernization Plan, outlining the steps necessary to update the Nation's flood maps in digital format. This plan is available at FEMA's Flood Hazard Mapping Web site, [http://www.fema.gov/mit/tsd/dl\\_mpmmod.shtm](http://www.fema.gov/mit/tsd/dl_mpmmod.shtm). The plan also suggested ways to streamline FEMA's efforts to raise public awareness of the importance of the maps and respond to requests for map revisions. In implementing the plan, FEMA was able to provide more accurate and extensive flood hazard information, resulting in safer communities and flood insurance commensurate with actual risk. In 2001, FEMA updated the Flood Map Modernization Plan in response to the growing need and demand for updated flood maps. This updated plan reflects the recommendations of the 1995-2000 Technical Mapping Advisory Council created by Congress.

Recognizing the connection between damage reduction and accurate flood hazard maps, Congress appropriated significant funding for Flood Map Modernization through the creation of a Flood Map Modernization Fund. The substantial increase in funding reflects the priority and commitment that the President and Congress have placed on Flood Map Modernization.

### 1.3 Flood Map Modernization

Some of the flood maps in FEMA's inventory are not current. FEMA needs to continue to modernize its maps for four primary reasons:

- New development and storm impact may change the physical environment such that the actual risks are no longer depicted on the flood maps.
- Better data is available, including topography, rainfall, gages, and other sources.
- New methods and models are available, providing more accurate predictions.
- Many areas have never been mapped.

The age distribution of the current nationwide map inventory is shown in figure 1-1. However, most of the engineering analyses contained within the studies may be significantly older than the dates on the maps; the true percentage of outdated maps may be greater than that shown in the pie chart.

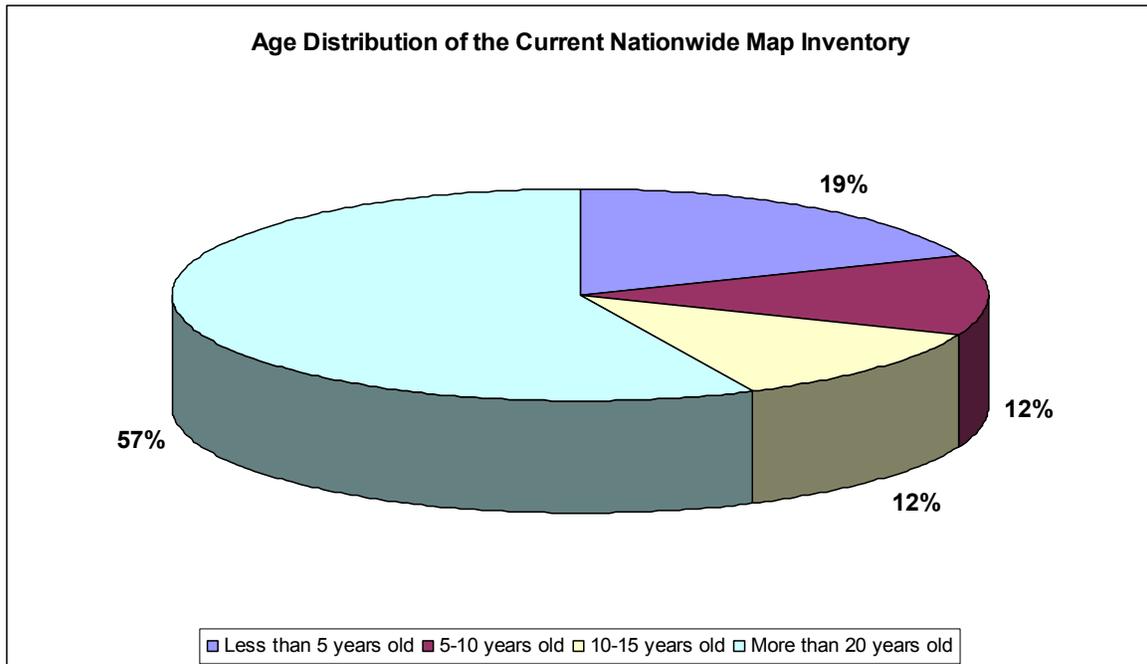


Figure 1-1. Age Distribution of the Current Nationwide Map Inventory (As of April 8, 2005)

Through Flood Map Modernization, FEMA intends to produce more reliable and accessible flood maps by using advanced technology to gather accurate data and to make the resulting information available via the Internet.

As flood hazard data is updated, the flood map inventory becomes a digital map system enabling officials at all levels of government to assess risks using geographic information systems (GIS)-based technology and data. This technology will increase awareness of flood hazards and access to flood data through electronic viewing, ordering, and distribution of maps. Although the flood hazard data FEMA develops will be used specifically for floodplain management, the data also will have applications for other purposes. FEMA’s initial focus is on flood hazard data; funding was specifically allocated for flood maps. However, the framework data and infrastructure developed by Flood Map Modernization also is expected to help local, state, and Federal officials mitigate and manage risk from multiple hazards, both natural and manmade. Reliable digital maps can provide better quality data to state and Federal officials on such factors as the location of hazardous material facilities, power plants, railroads, and airports for planning development and assessing internal weaknesses and evacuation routes.

***Flood Map Modernization will result in safer communities by providing more reliable, readily available, and easier-to-use flood maps.***

Flood Map Modernization will impact millions of citizens nationally. FEMA's flood maps serve the nation for insurance and flood disaster mitigation and relief. In 2002, industry experts reported more than 30 million uses of the flood maps by lenders and insurance agents. Flood hazard maps impact some 2 million development permits issued for new structures each year, and all federally regulated mortgages issued require that flood hazard maps be consulted. Flood Map Modernization will result in safer communities by providing more reliable, readily available, and easier-to-use flood maps and data for all communities throughout the Nation where there is flood risk.

Through Flood Map Modernization, FEMA is:

- Networking the Nation using Internet technology to provide access to general flood hazard, risk, and mitigation information.
- Maximizing the use of local, State and Federal resources, and transfer ownership and use of maps and data to the States and localities by building and maintaining effective partnerships with community, State, and regional entities before and during the development of maps and data. FEMA already has experienced considerable success with such transfers through the Cooperating Technical Partners (CTP) program.
- Reducing the processing time and cost for map updates and increase accountability for spending by implementing results-oriented systems and standards that will facilitate the rapid exchange of data between mapping partners, stakeholders, FEMA staff, FEMA contractors, and other users.
- Communicating with mapping partners, stakeholders, and users effectively, consistently, and continuously to maximize understanding of flood hazards and the risks that these hazards pose to life and property.
- Continuing to improve the quality and accuracy of national flood-hazard data by developing GIS-based products with reliable technologies that meet enhanced technical standards such as those defined in section 7 of the FY04-FY08 MHIP (Version 1.0), November 2004.

### 1.4 Flood Map Modernization Objectives

FEMA's long-term objective for Flood Map Modernization is for the entire U.S. population at risk to have reliable digital flood hazard data and maps for flood-prone areas.

The stated objectives of Flood Map Modernization are as follows:

1. **Establish and maintain a premier flood-hazard data collection and delivery system.**  
FEMA is creating a state-of-the-art geospatial system that collects and maintains the best

data available, integrates it into a national flood-layer theme, and provides easy access to reliable flood-hazard data and other information to support risk management applications and operations.

2. **Build and maintain mutually beneficial partnerships.**

FEMA is fostering mutually beneficial partnerships that achieve shared outcomes through the communication of flood risk and other hazards, and by improving the systems that support them. Partnerships result in enhanced delivery of risk management applications and operations. Flood Map Modernization includes innovative local, State, and Federal partnerships that use advanced technologies for determining and depicting flood hazards. Flood Map Modernization also includes improving e-Government processes for flood-hazard data collection and distribution. Through this objective, FEMA intends to maximize the reuse of existing data and cost sharing in the collection of new data with local, State, and Federal partners.

3. **Achieve effective program management.**

FEMA has developed a sound program management structure that motivates partners to share responsibilities and aligns with partners’ missions to reduce the Nation’s vulnerability to floods and other hazards. FEMA is developing and implementing data quality standards and product specifications in a way that minimizes the complexity of the standards while maximizing interoperability of the data and systems.

4. **Expand and better inform the user community.**

FEMA is helping to foster public and stakeholder understanding of where to obtain flood and other hazard data, and how to use and analyze it to make sound decisions to reduce vulnerability to natural and manmade hazards.

## 1.5 Flood Map Modernization Performance

FEMA’s Key Performance Parameter (KPP) for Flood Map Modernization measures the percentage of the population whose safety is improved through the availability of accurate flood risk data in GIS format. FEMA plans to increase the safety of at least 85 percent of the U.S. population through availability of accurate flood risk data in GIS format. This goal is expressed in table 1-1 as Flood Map Modernization’s KPP.

**Table 1-1. Flood Map Modernization Key Performance Parameter**

Parameter	Threshold	Objective
Percentage of the population whose safety is improved through availability of accurate flood risk data in GIS format	85%	100%

To achieve this goal, FEMA has set targets for Key Performance Indicators (KPIs) through FY09 (production is scheduled for completion in FY10). KPIs 1 and 2, shown in table 1-2, are designed

to measure population for whom maps are available online and population for whom counties have adopted effective maps. FEMA also uses other KPIs for measuring the success of Flood Map Modernization, but these two KPIs measure development and adoption of preliminary and effective flood maps, which is the focus of the MHIP.

The KPI targets are measured at a national level and began in FY04, the first year of full funding. Some regional statistics may exceed these KPIs and others may fall short; however, all regional statistics will roll up to the national KPIs. Section 6, Production Analysis, presents actual and projected achievement for each of these KPIs, from current status through projected status for FY10.

**Table 1-2. Map Modernization Key Performance Indicators**

Key Performance Indicators		Targets					
KPI	Management Indicators	FY04	FY05	FY06	FY07	FY08	FY09
KPI 1	Percentage of population with digital GIS flood data available on-line	20%	50%	65%	75%	85%	97%
KPI 2	Percentage of population with adopted maps that meet quality standards	10%	20%	35%	50%	70%	90%

Note: KPIs 1 and 2 are cumulative.

## 1.6 Flood Map Modernization Framework

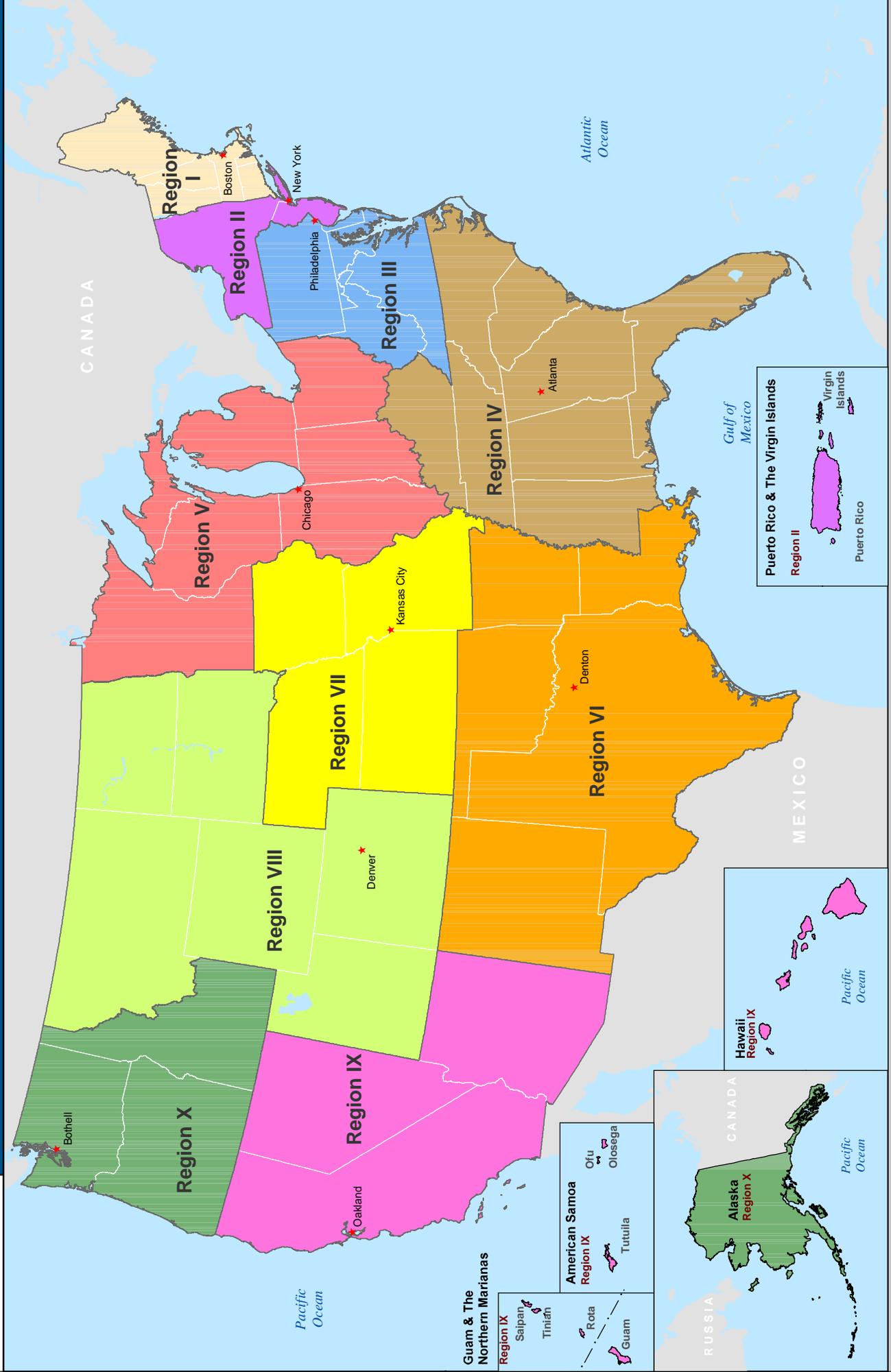
FEMA developed a program framework around anticipated funding for Flood Map Modernization. Map production costs are only a portion of total Flood Map Modernization costs. Flood Map Modernization funding must cover engineering and mapping; ongoing technical support; system and tools development; customer care and outreach; program management support; map maintenance; the development of methodologies and standards; needs assessment; library data management; and other activities.

Changes in overall funding may negatively affect the funds for map production by FEMA's Regions, which are shown in map 1-1, and the funding for the individual studies.

Section 3, Distribution of Funds to the Regions, provides details on FEMA's planned spending for Flood Map Modernization, focusing on map production and adoption.



# Map 1-1. FEMA Regions



Projection: Albers Equal-Area Conic  
Data Source: FEMA Sequencing Tool



MHIP

## 1.7 MHIP Process

### 1.7.1 Collaborative Process for a Plan Developed by FEMA and Stakeholders

The MHIP provides all mapping partners with a 5-year plan for map production, based on anticipated funding through FY08. The plan reflects proposed or estimated annual budget allocations, State and Regional Office business plans, changing study and mapping needs, and new data and technology.

Section 2, Stakeholder Input, presents the MHIP process, showing the planned annual cycle of stakeholder inputs, appropriations, and MHIP updates. Communication is critical to the development, flexibility, and continual updating of the MHIP. Communication facilitates the proper identification of flood hazard risks and the proper allocation of funds to provide the appropriate method of engineering study for the level of risk in each community. The MHIP process and successful communication will provide quality map products to all areas of the Nation where there is flood risk. FEMA will refine the plan annually by integrating community data along with mapping needs identified by States, Regional Offices, and the National Office.

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***The MHIP process and successful communication will provide quality map products to all areas of the Nation where there is flood risk.***

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### 1.7.2 Flexible Plan Allows Regular Updates to Adapt to Changing Conditions

The concept of a rolling 5-year plan is not new. In general, the MHIP process is modeled after the Federal Highway Administration's successful Transportation Improvement Plan (TIP) process. Metropolitan areas develop TIPs to determine how Federal fund allocations will be spent on various projects. These TIPs are then aggregated at the State level. Because budgets, needs, and priorities may change from one year to the next, it is not uncommon for the TIP to have a project scheduled to be done in 3 years, only to have it delayed or scheduled earlier in the following year's TIP.

This MHIP also allows updates to plans at the local level, as FEMA continues to respond to changes at local and State levels. FEMA expects to similarly re-evaluate and, as needed, re-sequence the map production projects as better information becomes available and budgets and needs change.

### 1.7.3 Plan Development and Updates

The foundations for this plan are state business plans and relative flood risk. In developing the initial MHIP, FEMA first assessed risk at the national level. FEMA used the overall picture of risk for the Nation to determine the allocation of funding by Region. FEMA's Regional Offices assessed risk and need at the regional level. State business plans, regional plans for Flood Map

Modernization, and other input were considered in developing the sequencing at the regional level. Budgets were established for individual studies given the anticipated funding. The Regional Offices and communities further address specific local needs during the scoping process. These local needs also are submitted to FEMA's Headquarters via state business plans and scoping data. FEMA posted the MHIP on the Flood Hazard Mapping section of FEMA's Web site for stakeholder viewing, with instructions for stakeholders to submit comments on the plan (see section 2, Stakeholder Input). Section 10 provides FEMA's planned schedule for updates in 2005.

## **1.8 Time Period Addressed by this MHIP**

The FY04-FY08 MHIP (Version 1.0), dated November 2004, addressed flood hazard study and map updates initiated in FY04-FY08. This update is the draft version of the FY05-FY09 plan. Flood hazard study production and map adoption by communities takes more than a year to complete. Therefore, the plan includes time periods falling between FY03 and FY10. References to these periods are, in general, related to flood hazard study production and map adoption timeframes, budget, the 5-year sequencing plan, the KPIs, or performance.

- Five-year planning period: This release, Version 1.5, is the Draft FY05-FY09 MHIP; Version 2.0, to become available in fall 2005, will be the finalized FY05-FY09 MHIP.
- Flood Map Modernization funding period: Map production for the nation is initiated through FY08. Some Flood Map Modernization studies were funded in FY03 and have already begun. MHIP provides detailed tables and graphs of projected flood map production sequencing and projected funding allocations, based on anticipated overall funding at the county level. Actual funding levels for county flood map updates are determined as flood mapping projects are scoped and projects are further defined.
- Flood Map Modernization production period: Studies anticipated to be funded through FY08 are scheduled to continue through FY10. Typically, studies are scheduled as preliminary and effective in the following two years, respectively. That is, a flood hazard study that is initiated in one year will be delivered to the community as a preliminary flood hazard study and map the following year, and will become effective the year after that. Therefore, the production period began in FY03 and extends 2 years beyond the last funding year, to FY10, by which time all maps are scheduled to become effective.

## **1.9 Organization of this Plan**

The other sections of this plan are organized and focused as follows:

- Section 2, Stakeholder Input: This section summarizes findings from the State and regional plans and describes how additional data will be collected and used to refine sequencing and

funding distributions. It also explains how stakeholders can submit questions and comments about the MHIP and how FEMA will keep them informed about MHIP updates.

- Section 3, Distribution of Funds to the Regions: This section presents the funding distribution factors, how they were used to determine the program phasing for the counties, and how final distributions were made based on other factors. The section also describes the use of sequencing as a tool in the distribution of funds. Finally, the section discusses recommended changes to the funding distribution factors for future distribution of funds.
- Section 4, FY03-05 Production Report: This section provides the current status of project goals, presents the sequencing tool, and defines how it is used and what information it provides. This section also presents the levels of funding for FY03 through FY05, describes how the actual performance compares to the national goals, and summarizes the overall progress to date.
- Section 5, FY05-FY10 Production Forecast: This section presents planned activities for the remainder of FY05 through FY10.
- Section 6, Production Analysis: This section discusses FEMA's past, present, and future Flood Map Modernization performance as it relates to the KPP and KPIs.
- Section 7, Map Quality: This section discusses FEMA's commitment to map quality and plan to incorporate quality standards discussed in the FY04-FY08 MHIP (Version 1.0), November 2004, into the *Guidelines and Specifications for Flood Hazard Mapping Partners*.
- Section 8, Cost-Saving Processes, Procedures, and Tools: This section presents cost-saving procedures, processes, and tools FEMA is implementing.
- Section 9, Geospatial Data Collection: This section presents FEMA's new Geospatial Data Collection policy and its plan for implementing that policy.
- Section 10, MHIP Updates: This section restates FEMA's effort moving forward to continue to refine the MHIP.

