



FEMA's Risk Mapping, Assessment and Planning (MAP)

Fiscal Year 2010 Report to Congress
April 13, 2010



Homeland
Security

Federal Emergency Management Agency

Message from the Administrator

April 13, 2010



I am pleased to present the report, “FEMA’s Risk Mapping, Assessment and Planning (MAP),” which has been prepared by the Federal Emergency Management Agency’s (FEMA) Mitigation Directorate.

This document responds to the reporting request set forth in the Explanatory Statement, which accompanies the Fiscal Year 2010 Department of Homeland Security (DHS) Appropriations Act (P.L. 111-83).

Pursuant to congressional request, this report is being provided to the following Members of Congress:

The Honorable David E. Price
Chairman, House Appropriations Subcommittee on Homeland Security

The Honorable Harold Rogers
Ranking Member, House Appropriations Subcommittee on Homeland Security

The Honorable Robert Byrd
Chairman, Senate Appropriations Subcommittee on Homeland Security

The Honorable George V. Voinovich
Ranking Member, Senate Appropriations Subcommittee on Homeland Security

Inquiries relating to this report may be directed to me at (202) 646-3900 or to the Department’s Deputy Chief Financial Officer, Peggy Sherry, at (202) 447-5751.

Sincerely,

A handwritten signature in blue ink, appearing to read "W. Craig Fugate". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

W. Craig Fugate
Administrator
Federal Emergency Management Agency

Executive Summary

The Federal Emergency Management Agency (FEMA) manages several risk analysis programs, including Flood Hazard Mapping, National Dam Safety, Multi-Hazard Mitigation Planning, and Hazards U.S. Multi-Hazard (HAZUS), that assess the impact of natural hazards that lead to effective strategies for reducing risk. These programs support the Department of Homeland Security objective to “strengthen nationwide preparedness and mitigation against natural disasters.” FEMA began Risk Mapping, Assessment, and Planning (Risk MAP) in fiscal year (FY) 2009 with funding from the National Flood Insurance Fund and Congressional appropriations for flood hazard mapping. The vision for Risk MAP is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property.

The work being performed under Risk MAP is grounded in current authorities provided in the National Flood Insurance Reform Act of 1994 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended.

The purpose of this report is to provide to the House and Senate Appropriations Committees a progress report on FEMA’s efforts to complete Flood Map Modernization, the foundational program for Risk MAP, and implement the Risk MAP program.

In the Nation’s comprehensive emergency management framework, the analysis and awareness of natural hazard risk remains challenging. In order for communities to make informed risk management decisions and take action to mitigate risk, a consistent risk-based approach to assessing potential vulnerability and losses and tools to communicate the message are needed. Risk MAP aims to address this gap. By analyzing and depicting flood risk, communities and the American public can better understand their risk and will make informed decisions to reduce vulnerability.

Ultimately, through collaboration with state, local and tribal entities, Risk MAP will reduce losses of life and property through effective local mitigation activities enabled by quality flood hazard data, risk assessments and mitigation planning. Risk MAP establishes an integrated flood risk management approach that leverages and enhances the existing data from Flood Map Modernization. Risk MAP will provide an integrated web-accessible national assessment of flooding risks based on quality flood hazard data. This information will enable communities to develop mitigation plans and make informed risk management decisions.

The major objectives of Risk MAP are to:

- Assess the Nation’s flood risk and use this information to increase public awareness of risk. This consistent, quantitative flood risk assessment will be used to track progress toward reducing the nation’s flood risk and to target Risk MAP resources to areas that are at greater risk.
- Increase public awareness and understanding of risk from natural hazards and risk management concepts.

- Ensure 80 percent of the Nation’s flood hazard data are new, have been updated or are deemed still valid. This goal includes:
 - Providing updated flood hazard data for 100 percent of the populated coastal areas in the Nation.
 - Evaluating levee status information to ensure the appropriate flood hazards are depicted on Digital Flood Insurance Rate Maps (DFIRM) for counties with levees, including those impacted by expiring Provisionally Accredited Levee status.
- Continue to meet statutory requirements of the National Flood Insurance Program (NFIP) through assessing on a watershed basis, the need to revise and update all floodplain areas and flood risk zones identified, delineated or established.

FEMA continues to collaborate with local, state, regional, tribal, national and other federal partners in communicating these objectives and implementing Risk MAP. Because FEMA’s efforts extend throughout the Nation, implementing Risk MAP helps to maintain the engineering capability in the state and private sectors – sustaining jobs and stimulating the economy.



FEMA’s Risk Mapping, Assessment and Planning (MAP)

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I. Legislative Language

The Joint Explanatory Statement that accompanies the Fiscal Year (FY) 2010 Department of Homeland Security (DHS) Appropriations Act (P.L. 111-83) states as follows:

FLOOD MAP MODERNIZATION FUND

The conference agreement provides \$220,000,000 for the Flood Map Modernization program as proposed by both the House and Senate. In fiscal year 2010, FEMA will continue to focus these funds on reviewing, updating, and maintaining maps to accurately reflect flood hazards. The goal shall be to review and, where necessary, to update and maintain data, methodologies, models, and maps that have been modernized, and to issue map updates no later than five years past the modernized dates of the maps. To support this goal, FEMA is directed to provide no less than 20 percent of the funds provided under this heading for map updates and maintenance conducted by Cooperating Technical Partners that provide a 25 percent cash match and have a strong record of working effectively with FEMA on flood plain mapping activities. With the fiscal year 2011 budget request, FEMA shall submit to the Committees a status report on the progress made towards the five-year Risk Mapping, Assessment, and Planning strategy. When allocating map modernization funds, FEMA is encouraged to prioritize as criteria the number of stream and coastal miles within the State, the Mississippi River Delta region, and the participation of the State in leveraging non-federal contributions. FEMA is directed to develop a National Digital Elevation Acquisition and Utilization plan for the purposes of supporting flood plain map updates. FEMA shall collaborate with the United States Geological Survey, the National Oceanic and Atmospheric Administration, the National Aeronautics and Space Administration, and States that have experience in acquiring and incorporating high resolution elevation data in the flood plain map updates. FEMA shall submit this plan to the Committees within six months after the date of enactment of this Act.

This report is provided in response to the requirement to “submit to the Committees a status report on the progress made towards the five-year Risk Mapping, Assessment and Planning strategy.”

II. Risk Mapping, Assessment and Planning

Flood Map Modernization to Risk MAP

In 2004, recognizing the connection between reliable flood maps and flood damage reduction, DHS's Federal Emergency Management Agency (FEMA) launched a federally funded initiative to implement a technology-based, cost-effective, long-term process for updating, maintaining, storing and distributing the flood hazard and risk information portrayed on Flood Insurance Rate Maps (FIRMs). The Flood Map Modernization Fund (FMMF) provides for updating and maintaining the inventory of more than 100,000 flood maps and modernizing the Nation's flood hazard data records.

Flood Map Modernization significantly improved the horizontal accuracy of the flood hazard maps and made some focused investments in vertical accuracy. The program makes flood hazard information more readily available, enabling the delivery of updated digital flood maps for the Nation's population. FEMA will be able to achieve the goals of Flood Map Modernization with funding received through FY 2008. Using that funding, FEMA has delivered modernized flood maps for 80 percent of the Nation's population and is projecting coverage of 92 percent of the population once all funds have been expended. These maps will be used for floodplain management purposes, to determine appropriate risk-based premium rates for the National Flood Insurance Program (NFIP) and to develop appropriate disaster response plans for federal, state and local emergency management personnel. In concert with the delivery of those products, FEMA has built a robust program management infrastructure, state-of-the-art map production processes, strong partnerships with other federal agencies, states and local governments, and a 21st century Web-based information platform.

Building on the digital and more reliable flood hazard information in place from Flood Map Modernization, Risk MAP plans to enhance the reliable flood hazard data which forms the foundation of credible flood risk assessments, and these assessments will in turn serve a critical role as communities engage in the mitigation planning process.

See Appendix A for details on Flood Map Modernization objectives and detailed performance to date.

Risk MAP Strategic Approach

Risk MAP will deliver quality data that increases public awareness and leads to action that reduces risk to life and property. Risk MAP significantly improves the integrated flood risk management approach by weaving county-level flood hazard data into watershed-based risk assessments. These risk assessments will serve as the basis for local Hazard Mitigation Plans and targeted risk communication activities. Risk assessments systematically analyze the people and property in a community or watershed potentially impacted by flood hazards to quantify physical, social and economic losses.

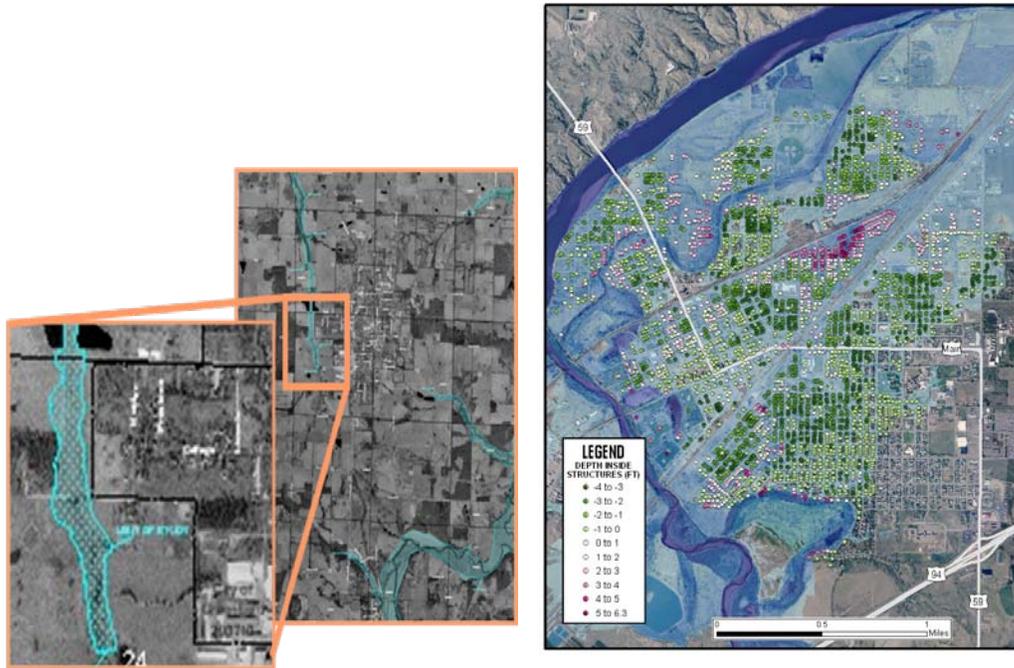
The Flood Map Modernization inventory will be enhanced by ensuring all analysis is model-based and includes multiple frequencies. These science-based products will be provided to communities to help convey flood risk so that they can take actions and build resiliency. Targeted risk communication activities include prioritizing Risk MAP products and services for the highest risk areas and highlighting areas where mitigation activities are most needed based on the results of the watershed risk assessments.

Although, Risk MAP is primarily flood hazard focused, the program establishes a framework for multi-hazard risk analysis, communications and mitigation strategies. Such functions as prioritization of resources based on risk and need, delivery of multi-hazard risk assessments and mitigation planning can be replicated across multiple hazard types.

In order to define the new approaches, strategies, products and services that the Risk MAP program will offer, and in follow-up to the *Risk MAP Multi-Year Plan: Fiscal Years 2010-2014*, the program has developed a solution and implementation plan. This solution will help drive the program forward in the coming years and focus efforts around key strategic goals.

FEMA will build on the benefits of digital flood hazard data by instituting easy, Web-based access to a powerful data analysis tool that quantifies flood risk in ways that facilitate improved mitigation planning and measure flood risk reduction. The overall goals for Risk MAP, as articulated in the Risk MAP Multi-Year Plan: FYs 2010–2014, are:

- Goal 1: Address gaps in flood hazard data to form a solid foundation for flood risk assessments, floodplain management and actuarial soundness of the National Flood Insurance Program.
- Goal 2: Ensure that a measurable increase of the public's awareness and understanding of risk management results in a measurable reduction of current and future vulnerability to flooding.
- Goal 3: Lead and support state, local and tribal communities to effectively engage in risk-based mitigation planning resulting in sustainable actions that reduce or eliminate risks to life and property from natural hazards.
- Goal 4: Provide an enhanced digital platform that improves management of limited Risk MAP resources, stewards information produced by Risk MAP and improves communication and sharing of risk data and related products to all levels of government and the public.
- Goal 5: Align Risk Analysis programs and develop synergies to enhance decision-making capabilities through effective risk communication and management.



Flood Map Modernization Digital Flood Insurance Rate Map (left) as compared to a Risk MAP Flood Risk Product (right)

In its basic form, Risk MAP drives local action through an integrated planning process. From a planning perspective, Risk MAP:

- Plans the implementation of projects on the basis of risk, need and local contribution
- Works with a broad spectrum of stakeholders throughout the process with the goal of providing a sustainable foundation on which the locals can continue to reduce risk
- Leverages local knowledge, experience and existing data and products to provide high-quality data that raises local risk awareness and supports local planning activities. Where that local knowledge, experience, data or products do not exist, FEMA will provide and/or assist the locals in developing it.

The implementation plan strives to drive local community action by integrating these planning concepts into a project with the goal of increasing community awareness and providing quality data to support both the increase in awareness and informed decision making by local leaders. The implementation plan also begins to define the digital tools and other program level actions that are needed to successfully implement.

In order to achieve the goals of Risk MAP, the following products and strategies are in place:

- Flood Hazard Engineering and Mapping
- Elevation Data Products and Strategies
- Watershed Strategy
- Project Prioritization and Sequencing Strategy
- Engineering and Mapping Products and Strategies

- Risk Assessment Products and Strategies
- Mitigation Planning Support Products and Strategies
- Risk Communication Strategies

Several key strategies to be highlighted as Risk MAP moves forward can be found in section 1.6 Risk MAP Implementation.

Risk MAP Program Measures

In order to measure the program's progress in achieving its goals and aligning with the Risk MAP goals (as outlined previously), a set of program measures has been defined. The program measures are outcome-focused and are designed to drive alignment of the people, products and processes with the Risk MAP Multi-Year Plan and vision.

The current Risk MAP measures include:

- Ensure 80 percent of the Nation's flood hazards are current by 2014 – the flood hazard data are new, have been updated or are deemed still valid through Risk MAP review and update process.
- Increase state, local and tribal officials' level of understanding of flood risk (currently being baselined). (To accomplish this, FEMA will conduct two quantitative surveys to measure the public's awareness and understanding of risk. The first survey will target the general public and will be conducted using random-digit dial (RDD), to be statistically valid at the regional (i.e., FEMA Regions) level. The second survey will target local chief elected officials, such as mayors, across the country and will be conducted by an online survey, statistically valid at the National level. Both surveys will be followed by an annual tracking survey to measure progress.)
- Ensure 80 percent of the U.S. population has planned mitigation strategies.
- Increase the percent of local hazard mitigation plans approved using quality risk assessment data (currently being baselined).
- Improve efficiencies by establishing a culture of continuous improvement and executing projects aimed at reducing process cycle time and improving the quality of Risk MAP products and services. (Improvement designed and implemented in FY 2010 will lead to \$15 million in cost efficiencies by FY 2011.)

As the Risk MAP Program moves toward the implementation, the program measures may be refined to ensure that FEMA is identifying the necessary performance metrics that demonstrate the progress of the program.

Risk MAP Program Budget

FEMA has a statutory requirement, under the National Flood Insurance Reform Act of 1994 (P.L. 103-325), to evaluate flood hazard data needs every five years and make updates available

to the public. The available fees from the National Flood Insurance Fund are not sufficient to address the statutory requirement to assess flood hazard data update needs and provide updated flood hazard data and maps. Therefore, additional funds are appropriated by Congress.

The following table reflects an integrated view of the Risk MAP Program budget. This budget is used to maintain the Nation’s flood hazard data inventory and implement the vision of Risk MAP. It is based on \$220 million of congressionally appropriated flood mapping funding and National Flood Insurance funding planned for FY 2010.

Table 1 – Program Budget for FY 2010

Operational Line Items	FY 2010 Budget	
	Flood Map Modernization Fund	National Flood Insurance Fund
Production & Technical Support	\$211,000,000	\$47,700,000
Customer & Data Service	\$1,100,000	\$41,000,000
Program Management	\$1,100,000	\$6,000,000
Program Support	\$200,000	\$2,100,000
Salaries & Expenses	\$6,600,000	\$10,200,000
Total	\$220,000,000	\$107,000,000

The following provides a brief description of the categories of work performed under the Risk MAP Program:

- Production & Technical Services: Regional production work, including Cooperating Technical Partner efforts. Also includes the technical support provided to the Regional offices and production-related policy development.
- Customer & Data Services: Operations, maintenance and development for the Map Service Center, the Mapping Information Platform and the Flood Map Assistance Center (call center). Also includes the operation of the Data Library.
- Program Management: Support for the management of the full program, including cost/schedule, capital planning and investment control, investment review boards, performance metrics and quality. Also includes National outreach.
- Program Support: Services, such as independent verification and validation, acquisition support, Defense Contract Audit Agency audits, internal tool development and partnership agreements.
- Salaries & Expenses: For the congressional appropriations, this is the three-percent administrative allowance for Flood Map Modernization Fund for positions, travel, training, rent, etc. For National Flood Insurance Fund fees, this is the flood studies and surveys component of the flood permanent full time positions.

The funding tied to operational support activities listed previously, as well as salaries and expenses, support all Risk MAP goals. Additionally, these activities complement the delivery of the National Dam Safety Program and the Hurricane Program.

Table 2 – Risk MAP Progress

Risk MAP Measure	Baseline: Progress through FY 2009	FY 2010 Goal
<p>Goal 1: Address gaps in flood hazard data to form a solid foundation for flood risk assessments, floodplain management, and actuarial soundness of the National Flood Insurance Program.</p>	<ul style="list-style-type: none"> ○ Approximately 1,800 miles of open coast, which represents 5 percent of the nation’s populated coastline, received updated engineering analysis. ○ With 123 levee projects initiated, review and update of DFIRMs was performed for those counties affected by the expiration of Provisionally Accredited Levees. ○ Reduced the riverine flood hazard data update needs based on other physical, climatologic, or engineering methodology changes by 14 percent, equating to 64,000 miles addressed. 	<ul style="list-style-type: none"> ○ Approximately 4,800 miles of open coast, which represents 20 percent of the nation’s populated coastline, will receive updated engineering analysis. ○ Reduce the riverine flood hazard data update needs based on other physical, climatologic, or engineering methodology changes by 24 percent, equating to 110,000 miles addressed.
<p>Goal 2: Ensure that a measurable increase of the public’s awareness and understanding of risk management results in a measurable reduction of current and future vulnerability to flooding.</p>	<p>Produced an average loss study for the 1-percent annual chance flood level for the Nation.</p>	<p>Create a baseline of local understanding of flood risk and produce a national annualized flood loss study (for multiple flood levels).</p>
<p>Goal 3: Lead and support States, local, and Tribal communities to effectively engage in risk-based mitigation planning resulting in sustainable actions that reduce or eliminate risks to life and property from natural hazards.</p>	<p>Ensure 70 percent of the U.S. population has planned natural hazard mitigation strategies.</p>	<p>Ensure 75 percent of the U.S. population has planned natural hazard mitigation strategies.</p>

Risk MAP Measure	Baseline: Progress through FY 2009	FY 2010 Goal
Goal 4: Provide an enhanced digital platform that improves management of limited Risk MAP resources, stewards information produced by Risk MAP, and improves communication and sharing of risk data and related products to all levels of government and the public.	Not applicable	Transition flood hazard data distribution from a paper-map-focused system based on high volume offset printing, to an all digital distribution except for the single paper copies provided to the affected local governments for legal adoption purposes.
Goal 5: Align Risk Analysis programs and develop synergies to enhance decision-making capabilities through effective risk communication and management.	Not applicable	Develop the prototype for new integrated Risk MAP products that augment the DFIRM delivered in Flood Map Modernization with additional flood risk information to enable broader risk communication.

For Goal 5, in FY 2010, FEMA will develop the prototype for new Risk MAP products. The prototype will consist of a risk assessment suite containing a risk assessment database along with a watershed flood risk report. The risk assessment database, containing multi-frequency depth and water-surface elevation grids, HAZUS risk assessment data and contributing flood hazard factors, will allow communities to access complete data sets used to develop the watershed flood risk report to support assessment, planning and mitigation efforts. The new Risk MAP products will allow for more engaged communities and effective communication to constituents about their flood risk.

As mentioned previously, a map of the United States depicting FY 2009 Risk MAP projects relative to Flood Map Modernization projects is provided in Appendix B – Map Graphic of this document.

More information regarding flood mapping projects initiated in FY 2009 can be found in FEMA’s Risk MAP “Fiscal Year 2009 Flood Mapping Production Plan” available on FEMA’s Website at http://www.fema.gov/plan/prevent/fhm/rm_main.shtm.

Regarding flood mapping projects being initiated in FY 2010, a Risk MAP Fiscal Year 2010 Flood Mapping Production Plan is being prepared and will be made available on FEMA’s Website in FY 2010.

Risk MAP Implementation

Flood Hazard Mapping

FEMA must continue to maintain the accuracy of the flood hazard data used in support of the NFIP. Leveraging successes from Flood Map Modernization, FEMA must take the next step to refresh more of the underlying engineering data depicted on the flood map. A key focus of Flood Map Modernization is establishing a foundation for easier information depiction and distribution of the mapped flood hazard. To ensure the Flood Map Modernization investment is preserved and built upon it is imperative to maintain the integrity and credibility of the engineering data for reliable risk identification, and ensure the information can be leveraged to improve mitigation activities beyond the minimum Federal requirements for participation in the NFIP.

Ultimately, these investments dedicated to flood hazard mapping will produce accurate flood hazard data, integrated watershed flood risk assessments and stronger hazard mitigation plans. Primary focus areas are coastal flood hazard mapping, areas impacted by levees and significant riverine flood hazard data update needs. FEMA's Risk MAP approach supports local risk assessment and planning activities while addressing the flood hazard data update needs, thus enabling citizens to increase awareness of flood risk and ensure good planning to mitigate against these risks.

There are three principal factors that drive the need for updated flood hazard analyses:

1. Physical changes: such as manmade influences which may include new bridges, culverts, levees and development in the floodplain
2. Climate changes: such as recent flood disasters or additional stream gauge data
3. Engineering methodology changes: such as improved computer models and better understanding of the physics of water flow

Many of these changes have taken place years after FEMA completed the initial analysis of flood hazards creating a backlog of other engineering needs in addition to the changes that continue to occur. Investments in these engineering needs will be evaluated and sequenced based on the three factors above, along with priority for states and communities that bring significant cost share and areas where the greatest number of flood insurance policies exist.

Keeping pace with these changes is important and failing to do so could lead to unwise land use decisions and construction standards, thereby putting homeowners at increased risk while providing a false sense of security. Conversely, overstated hazards can result in potentially unnecessary construction costs and incorrect insurance rating decisions. Sound reliable flood hazard information is a necessary component of ensuring the fiscal soundness of the NFIP.

There are five phases to identifying and addressing flood hazard data and mapping needs:

1. Review and revise flood hazard engineering data for mapped and unmapped floodplain areas and compile map update needs on watershed level

2. Prioritize hazard data update needs
3. Determine communities and counties eligible for flood hazard map update on the basis of identified needs
4. Determine scope of effort to address need
5. Update flood map production

During the implementation of Risk MAP, sustainable partnerships continue to be vital. Resources in the form of “cash match” or new data as identified in FEMA’s Bluebook are highly valued and are most beneficial for the program. When targeted at known flood hazard data update needs and included in the Partnership Agreement, FEMA will give its highest investment priority to capable partners who provide a 25-percent cash match. FEMA typically receives these contributions through existing successful partnerships within the Cooperating Technical Partners (CTP) Program. It is important to note that the 25-percent cash match is targeted at 20 percent of the overall Congressional appropriations (\$44 million in FY 2010). While contributions from multiple sources are valuable, FEMA will consider establishing a partnership under the CTP Program in flood map update prioritization and will support those partnerships that are mutually beneficial.

The FY 2009 DHS Appropriations Act (P.L. 110-329) authorized FEMA to spend \$220 million on updating, reviewing and maintaining maps to ensure that flood maps remain current and accurately reflect flood hazards. For FY 2009, Risk MAP flood map update projects were selected to align with engineering data needs for coastal, levee and other riverine flood hazards, and to leverage established CTP relationships.

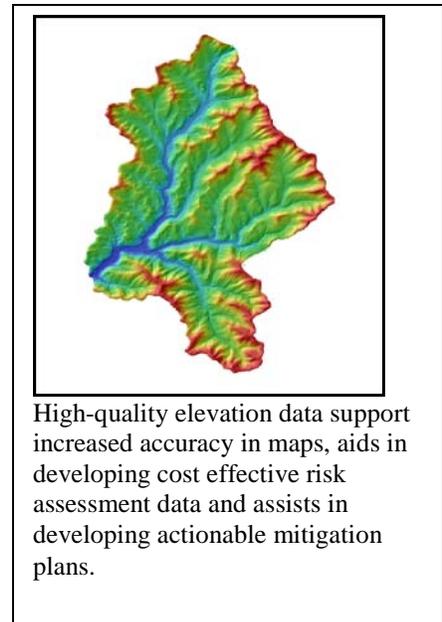
Similar to FY 2009, Risk MAP flood map update projects for FY 2010 are being selected to align with engineering data needs for coastal, levee and other riverine flood hazards, and to leverage established CTP relationships.

Elevation Data

One distinct difference in FY 2010 is the priority of updating projects in areas with available elevation data. High-quality elevation data form the foundation for increasing the quality of the flood maps and aid in developing risk assessment data and assists in developing actionable mitigation plans based on improved hazard data.

Historically, FEMA has made a conscious decision to limit elevation data acquisition in support of mapping projects. This philosophy has been driven by a need to conserve resources, a desire to share the responsibility of obtaining quality information with state and local stakeholders and a belief that FEMA-sponsored elevation data acquisition and processing may be outside of its statutory mission.

The importance of the accuracy of elevation data for FEMA



has been emphasized in two National Academies of Science reports. FEMA does have existing quality standards in place; however, the standards had not been assessed in more than 10 years. Therefore, for Risk MAP, FEMA has made a commitment to work closely with other federal, state and local agencies to obtain high-quality elevation data and to reassess the elevation quality standards. While FEMA will obtain, and support partners' efforts to obtain, high-quality elevation data, it will not become the steward of the data; rather, FEMA is working with the U.S. Geological Survey to facilitate the required stewardship.

High-quality elevation data will not only increase the quality of the flood hazard maps but, these data aid in developing risk assessment data, assist in developing actionable mitigation plans and improve credibility, all of which help FEMA achieve its overall mission of reducing the impact of disasters on lives and property. With better quality risk assessments due to updated elevation data and better communication of those risks, the public understanding of risk increases.

More information on FEMA's elevation data strategy and collaboration with other federal agencies will be found upon the delivery of the National Digital Elevation Acquisition and Utilization plan requested in P.L. 111-83.

Watershed

As FEMA transitions from Flood Map Modernization to Risk MAP, it is enhancing program delivery by providing Flood Insurance Studies (FIS) using a watershed approach, while still leveraging the systems and processes developed during Flood Map Modernization. FEMA will also continue to provide Digital Flood Insurance Rate Maps (DFIRMs) in a community-wide (or countywide) mapping format that supports community participation in the NFIP.

Historically, flood hazard analyses were performed at a community/county level for FIS and only addressed stream reaches within that jurisdiction. Watershed-based FIS resolve the issue of floodplains ending at jurisdictional boundaries and benefit a number of program enhancements proposed under the Risk MAP vision, such as risk assessment and mitigation planning.

Watershed-based assessments offer FEMA more opportunities to build stronger partnerships that leverage capabilities and capitalize efficiencies within all levels of government, non governmental organizations and the private sector. These partnerships will allow us to better identify risks associated with all-hazard threats, vulnerabilities and consequences, as well as to measure the capabilities necessary to minimize the identified risks.

The shift from a stream reach-oriented approach to a watershed-oriented approach will be technically efficient and provide stakeholders with a holistic perspective of their flood hazard. Although this change will require a shift in how the program is planned and administered, the watershed strategy increases the credibility of flood hazard data, makes for more cost-effective engineering, improves public understanding of river and floodplain systems and

Quantification of risk allows communities to analyze:

- **Physical damages** to residential/commercial buildings, schools, critical facilities and infrastructure
- **Economic losses**, including lost jobs, business interruptions, repair and reconstruction costs
- **Social impacts**, including estimates of shelter requirements, displaced households and population exposed to a series of flood events

increases collaboration with other federal agencies and scientific bodies.

Risk Assessment

A risk assessment identifies hazards and their associated risks, including threats to public health and safety, the environment, property damage and economic loss. The assessments combine the probabilities with the consequences in a way that quantifies risk. Quantifying the risk is a powerful way to communicate the threat, determining the key factors which cause it to be high and ultimately perform trade-off analyses to determine the most effective way to reduce, avoid or otherwise control it.

Within the context of Risk MAP, the assessment answers the question, “What would happen if a natural disaster occurred?” Risk assessments can include information such as: a description of the type, location and extent of natural hazards; the jurisdiction’s vulnerability to the hazards; and the type and numbers of buildings, infrastructure and critical facilities located in identified hazard areas. Providing risk information will enable local governments and policymakers to understand how their decisions increase or reduce risk.

For NFIP purposes, the ability to compare flood risk across states and regions is critical. At the state and community levels, flood risk information helps community leaders with planning, evaluating costs and benefits associated with building codes and other preventive measures. An understanding of the flood risk is important to risk management for businesses and industries that may be located within or near the floodplain. Finally, understanding the scope and potential consequences of flooding is critical to developing emergency management plans for catastrophes.

Multi-Hazard Mitigation Planning

Hazard mitigation planning is the process used by state, tribal and local governments to identify risks, assess vulnerabilities and develop long-term strategies for protecting people, natural environment and property from the effects of future natural hazard events. The process results in a mitigation plan that offers a strategy for breaking the cycle of disaster damage, reconstruction and repeated damage, as well as a framework for developing feasible and cost-effective mitigation actions.

As such, mitigation plans are the “tip of the spear” for the Risk MAP program. Communities use mitigation plans to leverage risk analysis data produced by FEMA and other agencies in order to develop a framework for becoming safer places in which to live. Mitigation plans, in this sense, are the tools that reduce risk to lives and property on the ground in thousands of communities across the Nation. Integrating mitigation planning with mapping and assessment is a key synergy derived from Risk MAP.

Under Section 322 of the Stafford Act, state, tribal and local governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance. The National Flood Insurance Act of 1968, as amended, made hazard mitigation plans a condition for receiving assistance through the National Flood Insurance Fund.

Since 2002, when FEMA published regulations implementing the mitigation plan requirement under 44 Code of Federal Regulation Part 201, FEMA has approved state mitigation plans for all 50 states, the District of Columbia, and seven territories. As of December 31, 2009, there are mitigation plans representing approximately 19,558 jurisdictions covering an estimated 77 percent of the Nation's population.

Appendix A – Objectives and Detailed Performance for Flood Map Modernization

Objectives of Flood Map Modernization

Flood Map Modernization will produce flood maps in a geographic information system format for areas with high flood risk, covering approximately 65 percent of the Nation’s land area and 92 percent of the Nation’s population. In addition, the modernization effort provides the flood hazard data in the most usable format with advanced tools and techniques that will enable FEMA and its state and local partners to produce high-quality data while managing cost and schedule constraints.

The NFIP Flood Hazard Mapping Program is the largest civilian thematic mapping program in the world. The inventory of flood hazard information represents a significant national asset. The digital platform for Flood Map Modernization is made up of program management tools; flood hazard data production tools; a content management system; digital flood hazard information; related technical data; and tools for finding, displaying, printing and analyzing hazards and risk. FEMA’s technology investments in Flood Map Modernization were crucial to implementing proper management of this asset and will be vital to monitoring and measuring the performance of Risk MAP.

Flood Map Modernization will accomplish the following on the basis of appropriations through FY 2008. (Note that the final flood hazard maps take approximately two to three years to complete after appropriations have been made, to allow due process for communities impacted by changes to flood hazard elevations and designations):

- Build a digital Geospatial Information System (GIS) platform for flood hazard map production and accessibility.
- Develop flood hazard maps for 92 percent of the Nation’s population available through the new platform.
- Ensure the Flood Map Modernization products meet FEMA’s quality standards as articulated in the Guidelines and Specifications found at: http://www.fema.gov/plan/prevent/fhm/gs_main.shtm. FEMA achieves accuracy by exceeding the follow two targets.
 - Ensuring 75 percent of the flood hazard boundaries meet the standards for horizontal accuracy.
 - Updating 30 percent of the flood hazard data, ensuring that the maps represent current conditions.

Performance of Flood Map Modernization

FEMA’s Key Performance Parameter (KPP) for Flood Map Modernization measures the percentage of population for which FEMA provides accurate flood risk in GIS format (i.e., DFIRMs). FEMA’s target for this KPP is 92 percent. To achieve this goal, FEMA created the

Key Performance Indicators (KPIs) for Flood Map Modernization to measure annual performance against a set of metrics related to flood map production. KPIs 1 and 2 were designed to measure the population for whom maps are available online and the population for whom counties have adopted maps, respectively. The figures that follow demonstrate progress to meeting the targets laid out for KPIs 1 and 2. It is important to note that for the accuracy of the flood hazard boundaries and flood hazard data, FEMA has exceeded the goals of 75 percent and 30 percent as outlined above.

As seen in Figure 1: Performance/Projection for KPI 1 through FY 2010, FEMA will meet its target of providing 92 percent of the Nation's population with digital GIS flood data and this information will be available online. As seen in Figure 2: Performance/Projection for KPI 2 through the end state, for FY 2009 there was a 12-percent gap between the target and performance at the close of the fiscal year. Flood maps were delayed during post preliminary processing. (Post preliminary processing is the phase of the mapping process during which FEMA provides affected communities, their citizens and other interested parties the opportunity to comment on a new flood insurance study report and map prior to establishment of an effective date by FEMA and adoption by those communities.) The FY 2009 target was not met because of several factors:

- Delays due to complexities in addressing the effects that flood control projects may have on current flood hazards
- Delays due to resolution of appeals received from communities or other interested parties
- Delays due to other factors including mapping partner performance issues

At present, these delays are not expected to impact FEMA's ability to meet the end-state objective of 92 percent of the Nation's population having effective DFIRMs that meet quality standards using funding provided under Flood Map Modernization from FY 2003 to FY 2008. Given that the final flood hazard maps take approximately two to three years to complete after appropriations have been made, FEMA projects to reach the end-state objectives by the end of FY 2011.

A map of the United States depicting Flood Map Modernization projects to FY 2009 Risk MAP projects is provided in Appendix B – Map Graphic. More detailed information regarding mapping progress is available in the “Flood Map Modernization Progress Report” for FY 2009 at http://www.fema.gov/plan/prevent/fhm/dl_mhip.shtm. FEMA is preparing a Flood Map Modernization Progress Report for FY 2010 which will be made available on FEMA's Website in FY 2010.

Figure 1: Performance/Projection for KPI 1 through FY 2010

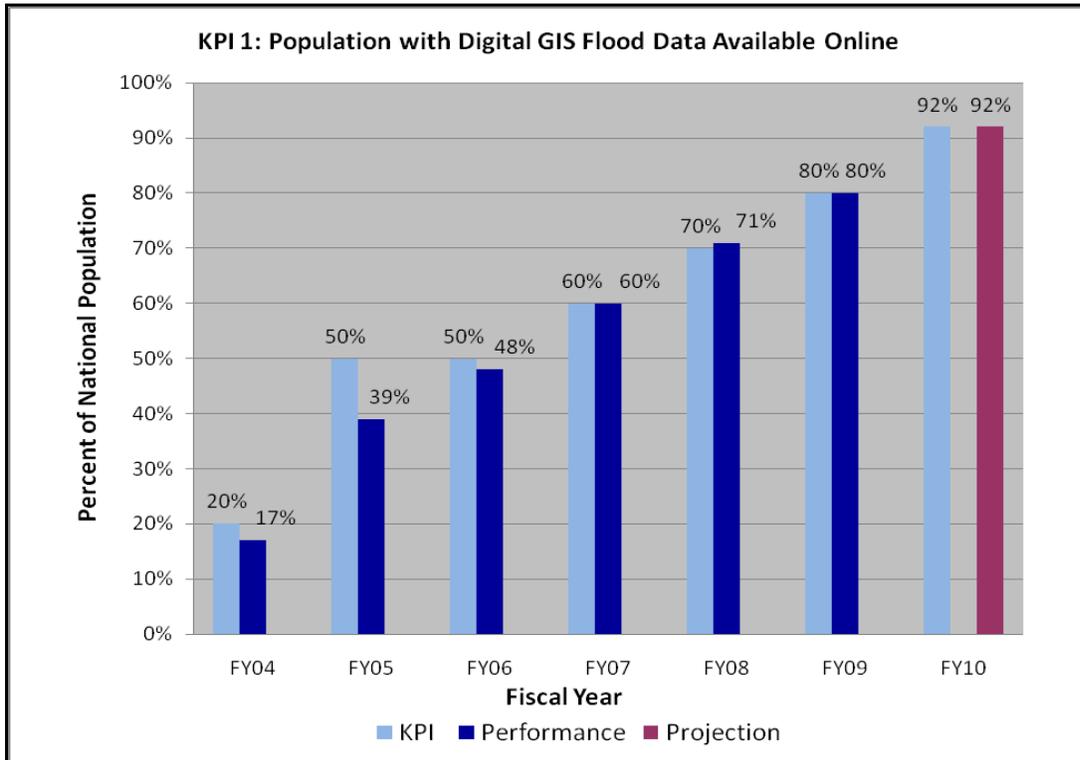
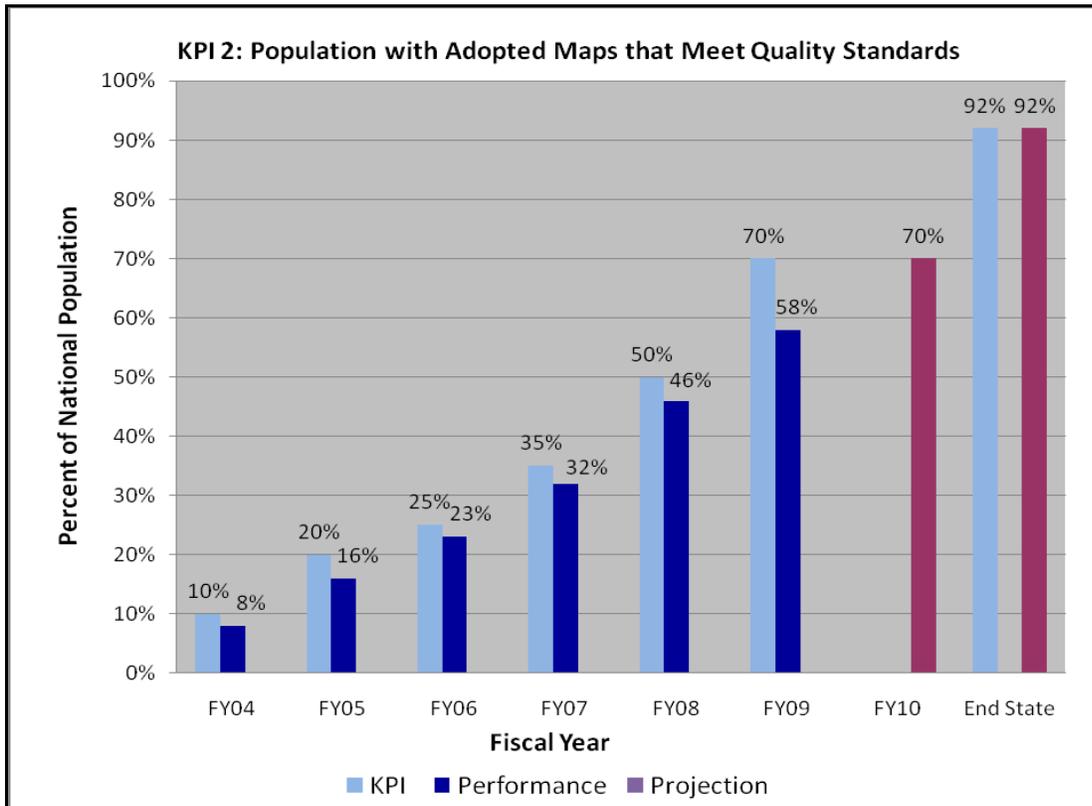


Figure 2: Performance/Projection for KPI 2 through the End State



Appendix B – Map Graphic

The graphic on the next page represents a map of the United States, depicting FY 2009 Risk MAP projects relative to Flood Map Modernization projects. The underlying national graphic with colored shading represents a combination of completed and ongoing Flood Map Modernization projects, as well as those areas not addressed within the program, with those projects that were funded with FY 2009 funding. The dots provided throughout the graphic represent those projects where FY 2009 Risk MAP funding was provided to enhance the engineering in a completed or ongoing Flood Map Modernization project.

NATIONAL FLOOD INSURANCE PROGRAM

FY09 Activities Relative to MapMod Counties

