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FEMA's Flood Hazard Map Modernization Initiative

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Summary

In 1968, Congress created the National Flood Insurance Program (NFIP). This program called for the federal government to help cover costs of flood damages, creating a structure that assigned the financial responsibility to individuals and entities particularly at risk for flooding. Congress amended NFIP in 1973, requiring the Flood Insurance Administration in the Department of Housing and Urban Development to produce countywide "Flood Insurance Rate Maps," or FIRMs, to set federal flood insurance premiums based on flood risk. In 1979, the newly created Federal Emergency Management Agency (FEMA) became responsible for producing FIRMs. By 1994, FEMA had developed a prototype FIRM as a digital file, or DFIRM, that could be displayed on a computer. The agency announced that for flood data management and map production efficiency it intended to expand its DFIRM inventory. In 1997, when DFIRM production was becoming operational, FEMA's director delivered a strategic plan for a "Flood Map Modernization Initiative (FMMI)" to Congress, whereby all *new* flood maps would be produced as DFIRMs and 100,000 FIRMs would be converted to digital file format. In 1999, FEMA reported that FMMI would be completed by 2007. FEMA's goal now is 2008.

Congress appropriated an initial \$5 million to establish the FMMI in FY2000. After that initial step a debate developed concerning future funding for the program. The White House and Congress had differences of opinion about how the program should be funded, by an agency's internal fee-levying and spending authority or by appropriations. At times, the House and Senate debated about whether to fund the program at all. The September 11, 2001 terrorist attacks on the United States led to the creation of the Department of Homeland Security (DHS) by the Bush Administration and Congress in December 2002 (P.L. 108-5). FEMA was brought under DHS authority in March 2003 and continues to operate the flood mapping program. In FY2004, FEMA's budget authority was transferred to DHS appropriation subcommittees.

DFIRMS are developed from U.S. Geological Survey digital maps depicting visible land-surface features such as waterways, terrain, and regional infrastructure. Local or regional infrastructure and environmental data provided by local officials are also incorporated to identify where flood hazards may affect human settlements. Although some local data have become available as digital maps, local paper maps are still prevalent and are produced at geographic scales different from what USGS uses. In 1997, when FEMA unveiled the FMMI strategic plan, some regional and local authorities became concerned about FEMA's new requirement that they provide local data and maps as digital files to aid in DFIRM production. At the time, FEMA made this a condition for remaining in the NFIP and retaining federal flood insurance coverage. However, by 1999, FEMA realized that it would need to provide grants to some state/tribal governments and direct funding to economically challenged local jurisdictions to attain FMMI goals. FEMA has since contracted for professional mapping assistance in converting paper flood maps to digital files for uniform DFIRM input. Recognition of flood hazard studies needed after Hurricane Katrina, executing timely regular updates of DFIRMs, and the fate of the FMMI under DHS are some of FEMA's recent concerns. The report will be updated as warranted.

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FEMA's Flood Hazard Map Modernization Initiative

Background on the Federal Flood Mapping Program

The Federal Emergency Management Agency (FEMA), currently part of the Emergency Preparedness and Response Directorate (EPRD) of the Department of Homeland Security (DHS),¹ develops and produces digital flood insurance rate maps popularly known as DFIRMs, which depict flood hazard risks throughout the United States.² This responsibility arose originally out of the National Flood Insurance Program Act of 1968 (NFIPA, 42 U.S.C. 4001 *et seq.*).

When Congress amended the NFIPA in 1973,³ it required that all communities declared by the former Flood Insurance Administration (FIA) in the Department of Housing and Urban Development (HUD) as flood-prone be eligible for federal flood insurance.⁴ In addition, the FIA was required to conduct flood hazard studies (FHSs) in communities, identify flood risks, and develop (paper) flood maps, or FIRMs, as a standard tool for setting federal flood insurance rates and for establishing criteria for a community's participation in the NFIP.⁵

¹ On Mar. 2, 2005, Director Michael Chertoff of the Department of Homeland Security (DHS) proposed a reorganization of the agency through the 2SR Initiative. Among other things, 2SR would eliminate the EPRD in favor of reestablishing FEMA with more independence within the DHS. The Director began implementing the initiative Oct. 1, 2005. (See CRS Report RL33042, *Department of Homeland Security Reorganization: The 2SR Initiative*, by Harold C. Relyea and Henry B. Hogue.)

² FEMA flood maps depict Special Flood Hazard Areas (SFHA), regulatory floodways, the 100-year floodplain, or Coastal Flood Hazard Areas (CFHA). (See **Glossary**.) These maps are used to illustrate whether real property and structures may lay within a FEMA-designated flood hazard zone or are adjacent to one.

³ FIRMs produced prior to 1973 were often hand-drafted based on information from local land surveys and local community property data and were produced on an *ad hoc* basis after a major flooding disaster. After 1973 uniform standards were developed for FIRM production under the NFIP.

⁴ 42 U.S.C. §4012, "The sole criterion for determining whether an applicant will be accepted as an insured involves whether or not the community in which the property is located participates in the NFIP; if so, the property is then rated in accordance with its [flood] zone and other criteria such as total amount of coverage requested by the community."

⁵ For the purpose of this report, "community" is the administrative unit of government that participates in the National Flood Insurance Program (NFIP), which has been mapped by FEMA for potential flood hazard risks, and for which a unique FIRM has been produced. Although flood maps are often county-wide, the definition of "community" may be

(continued...)

Subsequent to 1973, substantial time, labor, and financial resources went into compiling an inventory of more than 100,000 paper FIRMs. To produce them, FEMA collected and compiled geophysical and environmental data, conducted land and aerial surveys, and interviewed local citizens as a prerequisite for developing a FIRM. This procedure is known as a Flood Hazard Study (FHS), and is still used by the flood insurance industry and FEMA for determining flood hazard risks and by floodplain management professionals and developers for making land-use planning decisions.⁶ In 1979, after its creation by President Carter, FEMA assumed responsibility for producing and maintaining a large inventory of *standardized* FIRMs. It also certified their quality and accuracy. By the mid-1990s, FEMA managed about 100,000 county-based paper FIRMs. It sold copies of these and provided flood-related consultative services to local governments, surveyors, engineers, lending institutions, and private citizens.

In the early 1990s, some FHS-related environmental data and maps used to develop FIRMs were becoming available in a new medium, as electronic digital data files. Mapping professionals could manipulate digital map files using an automated geographic information system (GIS) and produce “derivative” maps for a variety of specific purposes. The U.S. Geological Survey (USGS) in the Department of the Interior led studies on digital mapping as a means to tackle the problem of managing federal spatial (geographic) data and information and map storage and distribution. The first digital maps of land areas of the United States were developed by the USGS National Mapping Division (NMD). NMD soon began developing standards for map production and management for other federal mapping agencies.

In April 1994, President Clinton’s Executive Order 12906 mandated that USGS promulgate standards for digital spatial data management that could be applied uniformly across the federal government.⁷ The Clinton Administration envisioned the creation of a “National Spatial Data Infrastructure” and an associated spatial data clearinghouse available for public consumption.⁸ Developing standards for federal digital spatial data storage and mapping came under the authority and guidance of the newly created Federal Geographic Data Committee (FGDC) established in USGS.⁹

⁵ (...continued)

expanded to include tribal, local, regional, and, in some cases, state governments.

⁶ An FHS yields “spatial” data, as defined by geographers. These may be quantitative or qualitative measurements of the various geographic elements on a map relative to points, objects, and areas of defined boundaries. These are referenced to specific geographic coordinates (longitude and latitude). Spatial data can also be “attribute” data, which are facts, statistics, and descriptions of natural and man-made phenomena associated with a specific geographic location. On digital maps, geographic data are referred to as “spatially-referenced digital data (srdd).”

⁷ Executive Order 12906, “Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure,” 59 *Federal Register* 17670-17674, Apr. 13, 1994.

⁸ National Research Council, *Toward a Coordinated Spatial Data Infrastructure for the Nation* (Washington, D.C.: National Academy Press, 1993).

⁹ FGDC, operating within the National Mapping Division of the Department of the Interior’s
(continued...)

Since then, FGDC has developed standards for (1) digital spatial data storage and classification (metadata); (3) file contents (e.g., default data layers required to be included in all federal maps, called the “data framework”); and (4) appearance (e.g., how digital federal maps look as graphic images on a computer workstation). The FGDC also assisted federal agencies to comply with E.O. 12906.

After a few years, when digital maps were becoming somewhat commonplace, FEMA, anticipating that electronic file transfer protocol (FTP) would become the standard medium by which federal government agencies would exchange spatial data and information, worked with FGDC to devise standards for digital flood maps.¹⁰ In short time, FEMA developed a prototype digital flood insurance rate map, which it dubbed the “DFIRM.” FEMA officials began to explore ways to make the flood map production process and distribution more cost effective and mapping operations better managed. To assist in that effort, Congress created a Technical Mapping Advisory Council (TMAC) in the National Flood Insurance Program Reform Act of 1994 (P.L. 103-325, hereafter 1994 NFIPRA). TMAC was directed by the act to make recommendations about how FEMA’s federal flood map program would comply with E.O. 12906. The TMAC, chaired by FEMA, completed its work in 1997 and, among other things, recommended that the DFIRM be the standard tool by which flood hazard risks would be assessed and federal flood insurance rates set. TMAC also recommended development of an all digital map inventory as soon as was possible. FEMA adopted both recommendations.¹¹

Encouraged by a growing inventory of DFIRMs, in September of 1997 James Lee Witt, then Director of FEMA, issued a seven-year strategic plan introduced as the Flood Map Modernization Initiative (FMMI). The FMMI set out long-term plans for digital flood hazard map production and management of inventory to support federal flood insurance coverage decisions. The strategic plan indicated that FEMA would convert more than 100,000 paper FIRMs to digital data format, and all new flood maps and those in need of revision (updating) would be produced as DFIRMs, if possible.¹² FEMA stated that it would attain an all-DFIRMs inventory by 2007.¹³

⁹ (...continued)

U.S. Geological Survey, is an interagency group that coordinates standards for surveying, mapping, and related spatial data management activities, including the development of metadata, which describes those data sets. It was created on Oct. 19, 1990, in accordance with OMB’s revised circular A-16, which (1) mandates a standard protocol devised for collecting, archiving, and transferring digital spatial data, (2) requires that management of such data be standardized across the federal government, and (3) requires that any subsequent creation of federal mapping databases be in digital data format. See [<http://www.fgdc.gov>].

¹⁰ National Research Council, *Spatial Data Needs: The Future of the [USGS] National Mapping Program* (Washington, D.C.: National Academy Press, 1990).

¹¹ FEMA, Technical Mapping Advisory Council (TMAC), *Final Report to the Honorable James Lee Witt, Director, Federal Emergency Management Agency: A Summary of Accomplishments and Recommendations, 1995-2000* (Washington, D.C.: FEMA, 2000).

¹² *Modernizing FEMA’s Flood Hazard Mapping Program 1999: A Progress Report*, Ch. 3, “Map Modernization Plan Objectives” (Washington, DC: Sept. 1999). This report focused (continued...)

Program managers at FEMA, mapping professionals, and other stakeholders in the FMMI, which include state, tribal, and local governments and private sector enterprises urged the Clinton Administration to recognize that achieving a complete DFIRM inventory would rely extensively on nurturing flood map partnerships within NFIP-participating communities. From the outset of FMMI implementation few government authorities were prepared to provide geographic data and maps in digital format, produce digital maps, or convert older paper maps to digital files for FEMA. In most cases, in-house capabilities of local governments were scarce or did not exist. Many did not have sufficient monetary resources to pay for private sector services nor the human resources needed manage such an effort. Still, FEMA mandated that all NFIP communities have DFIRMs produced within seven years and that local or regional contributions for the FMMI had to be digital data and/or map files in order for them to remain in the NFIP and retain flood insurance coverage.¹⁴

Recognizing the financial hardship that might be experienced by some less economically advantaged communities, and in particular those newly identified by FEMA as flood-prone, in FY2000 Congress authorized establishment of a Flood Map Modernization Fund (FMMF). President Clinton had requested spending authority in his FY2000 budget to address immediate “flood map modernization” needs after a presidentially declared flood disaster. From FY2000 through FY2002, Congress authorized between \$20 million and \$50 million in disaster relief funding (DRF) annually to conduct emergency flood hazard studies (FHSs) and to produce pre-FIRMS called “Flood Boundary Maps,” and to revise flood hazard maps as DIRMS in affected areas.

President George W. Bush’s FY2003 budget request stated that “inadequate funding hinders the [flood mapping] program,” and that “maps are needed to assist rebuilding after disasters and to steer future development away from floodplains.”¹⁵ To address this problem, he requested \$300 million in aggregate to fund the FMMI from FY2003 through FY2007. The newly established Department of Homeland Security (DHS)’s FY2003 budget justification stated that the President’s requested funding level for the FMMI would help to allay some community governments’ financial concerns about development of DFIRMs. In addition, to assuage some public opposition and mistrust of FMMI, FEMA proposed to invest a portion of the requested funding in educating local community governments and the public about the initiative. FEMA urged the President to request congressional appropriations for non-reimbursable grants authorized by Title IV of the Robert T. Stafford Act of 2004. FEMA also planned to train state, tribal, and local governments in managing flood-related emergency management through its field officers and through its own

¹² (...continued)

on, among other things, FEMA’s determination to have all digital flood maps (DFIRMs) available by 2007.

¹³ Ibid.

¹⁴ Ibid, Sect. 1, Background: *Strategic Plan for FMMI, 1997*.

¹⁵ Executive Office of the President, Office of Management and Budget, *Fiscal Year 2003, Budget of the U.S. Government*, “Federal Emergency Management Agency: Status Report on Selected Programs” (Washington, DC: GPO, 2002), pp. 315-318.

certified emergency management academy in Emmitsburg, PA. As an “in-kind” service, FEMA would assist local emergency management authorities in increasing their ranks.

In addition to the \$300 million appropriation requested by President Bush for FMMI, he stated that another \$350 million in spending authority for FY2003 through FY2007 would be derived from flood map services fees.¹⁶ In FY2003, for the first time since the creation of the Flood Map Modernization Fund, Congress appropriated a total of \$150 million for FMMI, or half of the President’s request. Additional spending authority from flood policy fees was not approved. Since then, the Administration’s funding request and subsequent congressional appropriations for FMMI have been level funded at around \$200 million annually.

Budget Issues

Since its inception, FEMA’s Flood Map Modernization Initiative (FMMI) has faced economic, social, and legal issues, which supporters and non-supporters alike have identified as potential “barriers” to the program’s success.¹⁷ With respect to economic “barriers” to progress, FEMA’s flood mapping partners, some of which historically have provided flood-map-related data and other supporting information, have posed the following questions:

- Who pays for collection of non federal digital data used for modernizing and updating flood insurance rate maps?
- Who is responsible for managing the suite of those digital data?
- Who has proprietary rights to local data and maps after they are converted to digital format?
- What are the requirements and schedules for future updating of DFIRMs?
- Who is responsible for updating them?
- Can private entrepreneurs compete for contracts for flood hazard studies and DFIRM production?
- Could private citizens or entire NFIP communities be required to pay higher federal flood insurance rates after transition to DFIRMs?
- Could private citizens lose their homes, properties, or businesses because of flood map revisions?

¹⁶ Ibid. “Federal Emergency Management Agency: The President’s Proposal,” pp. 318-322, including funding table.

¹⁷ Some compare FMMI’s development with that of the National Spatial Data Infrastructure (NSDI) created by E.O. 12906. During NSDI’s planning stages a panoply of technical, social, and legal issues were raised, which ranged from (1) potential cost of the project; to (2) challenges of digital data acquisition; (3) privacy rights of landowners *vis-a-vis* data collection; (4) citizens’ concerns about the personal nature of those data which could be included in publically accessible (mapping) databases; (5) proprietary rights to those spatial data; and, finally, (6) national security implications of those data. See “National Spatial Data Council — a True Partnership for NSDI,” *GEOworld*, Nov. 1999, pp. 36-37; and, “What’s the Federal Role in NSDI?,” *GEOworld*, Apr. 2000, pp. 48-50.

- Can private citizens challenge FEMA’s determinations of flood hazard risk on a DFIRM?

As the FMMI has progressed, many of these questions have been addressed by FEMA. It has lauded the assistance provided through voluntary partnerships which have developed through long standing relationships with non federal government officials and private enterprise. FMMI program managers have noted that these partnerships were integral for conceiving and developing the FMMI, and that they will be key to ensuring that there are regularly updated flood hazard maps for the Nation.

FEMA’s earlier projected costs to implement FMMI, and requirements imposed on NFIP communities have prompted local government authorities to question what resources communities can reasonably be expected to provide to the agency. Although FEMA has historically enjoyed free access to much of community-level proprietary data and maps compiled by flood map partners, leveraging the expenses associated with FMMI has required thus far that 20% of federal funding and the value of grants extended to implement FMMI be matched by states. However, FEMA has accepted “in-kind” services from local mapping partners, including human resources to assist in conducting FHSs for DFIRMs.

Cost Estimates for FMMI

In May 1999, FEMA officials projected an original cost of \$1.2 billion for implementing FMMI. (See **Table 1.**) That estimate was based on a survey of 10% of communities participating in the National Flood Insurance Program (NFIP). Results of the survey were extrapolated for the entire 100,000 communities then mapped under the NFIP. In addition, a major economic assumption at that time was that regular annual appropriations for FMMI would begin in FY2000. Congress, did not appropriate annual funding for the FMMI until FY2003, however.^{18 19}

Decreasing Cost Projections. A second round of cost projections was reported only three months later, in August 1999. FEMA released its first *Map Modernization Plan Update*, which took into account several factors and assumptions about program costs that had not been considered in the May 1999 projection. For example, the report stated that by August 1999 FEMA had made substantial progress in launching DFIRM operations and it was already providing limited digital mapping services. In addition, by that time a portion of the paper FIRM inventory had been converted to, or revised in digital format. Also, by the time President Bush had

¹⁸ U.S. Congress, House Subcommittee on VA, HUD and Independent Agencies Appropriations, 2002, report on H.R. 2620 (H.Rept. 107-159, July 17, 2001). The Subcommittee recommended \$100 million for a “new flood map modernization program” in lieu of the President’s request for funding of \$300 million; however, no appropriations were approved for FMMI in FY2002.

¹⁹ U.S. Congress, House Committee on Appropriations, the *Omnibus Consolidated Appropriations Act, 2003*, conference report to accompany H.J.Res. 2, (H.Rept. 108-10, Div. L, Homeland Security Act of 2002 Amendments). See FEMA, “Flood Map Modernization Fund,” Feb. 13, 2003, p. 1475.

submitted his FY2001 budget in February 2000, FEMA's digital map customer service component, the "Map Service Center," was providing access to a limited number of DFIRMs that were available on Compact Disk for sale.²⁰ FEMA noted in the August 1999 update that because of operational advances alone, the incremental costs associated with product distribution would be reduced by \$23 million, as compared with May 1999 estimates.²¹

Table 1. Early Cost Estimates for FMMI
(\$ millions)

FMMI Component	May 1999	August 1999
FEMA-funded flood data updates	748	385
Digital conversion and map maintenance	56	191
Unmapped communities	132	118
Ongoing activities	234	344
Map and customer services initiatives	23	—
Conversion to metric and NAVD88	42	62
Contracted administrative staff	—	13
Total mapping costs	\$1,235	\$1,114
Expected income from existing fees	\$364	\$364
Incremental appropriations needed for FMMI	\$871	\$750

Source: *Modernizing FEMA's Flood Hazard Mapping Program*, May 2001, estimating total mapping costs and incremental appropriations needed for FY2003 through FY2007.

FEMA indicated another possible cost saving could result from routinely employing high-tech remote sensing instrumentation on satellites in the "near future" that is capable of collecting much of the environmental and geophysical data needed as part of FHSs.²² One of the most promising applications FEMA has tested for acquiring flood hazard risk data is Light Detection And Ranging radar (LIDAR). FEMA noted that this technology can be employed on the ground or mounted in aircraft to survey land features which are known to signal potential flood hazard

²⁰ FEMA, "Welcome to the Map Service Center's Online Access to National Flood Insurance Products," at [<http://www.msc.fema.gov/contact.shtml>].

²¹ Matt Miller, Chief, Hazards Study Branch, Hazard Mapping Division, FEMA, *Cost Estimate for the Flood Map Modernization Plan*, Aug. 27, 1999.

²² "Flood Hazard Mapping: Modernizing FEMA's Flood Hazard Mapping Program," *Work in Progress* (e-newsletter), May/June 1999, at [http://www.fema.org/mit/tsd/mm_lidar.htm]. FEMA published guidelines for the use of airborne Light Detection And Ranging (LIDAR)® radar systems for use in flood insurance studies.

risk.²³ USGS geophysicists had demonstrated before that airborne-mounted LIDAR can penetrate dense vegetation and expose underlying terrain and was used to produce digital imagery of the Earth's "geological surface." Mapping professionals reported that when reconciled with aerial photography, LIDAR could be used to validate spatial measurements on maps. They noted further that a geographic information system (GIS) provides the means to superimpose LIDAR and visual data "layers" to produce derivative maps depicting more precisely the spatial boundaries of flood hazard risks.²⁴

FEMA also conducted trials with international space agencies that operate satellite-mounted Interferometric Synthetic Aperture Radar (IFSAR). IFSAR is a microwave imagery technology whose data can be overlain on visual surface imagery, including USGS maps, to demonstrate subtle environmental changes occurring in as little as a 24 hour period, which may include shifting river beds and channels.²⁵ IFSAR also sense physical topographical changes at *regional* scales making it possible for floodplain managers to monitor flood conditions at the watershed level and validate changing base flood elevations (BFEs). At that scale, IFSAR can depict maximum area of flood inundation and also measures the rate of receding waters, which is important for post disaster assessment and for safe repopulation in previously inundated flood-stricken areas. Still another technology used by flood plain managers and USGS hydrologists is the satellite-based global positioning system (GPS), which can detect real-time changes in depth, speed, and volume of FEMA-regulated floodways.

Increasing Costs. Countering promising costs savings, the August 1999 report also projected potential cost increases for other components of FMMI, which included (1) maintaining the physical infrastructure and equipment required to produce, revise, and manage a growing volume of DFIRMs in the long-term (if those were to be maintained in-house); (2) acquiring regional and local digital imaging and mapping resources for previously unmapped communities with an FHS; and (3) procuring technology and expertise to convert the balance of paper FIRMs to digital file format. (See **Table 1.**) The 1999 Update concluded that FEMA would need to republish about 17,500 FIRMS requiring new FHSs; convert the balance of FIRMS to DFIRMs; and perform five-year map updates mandated by the National Flood Insurance Program Reauthorization Act (NFIPRA) of 1994 for at least 74,500 NFIP communities. Two years later, in May 2001, FEMA released a second *FMMI*

²³ "LIDAR Provides Better Digital Elevation Modeling (DEM) Data," *GEOworld*, Nov. 2000, pp. 30-31. This article discusses the role of aircraft-borne lasers for making more accurate topographical measurements. For flood analysis and "bare earth models," see "Discover the Importance of LIDAR technology," *GEOworld*, Jan. 2001, pp. 30-3.

²⁴ Chad Mills, "Surviving the 500-Year Flood: Citywide GIS Helps North Dakota Citizens Recover from the States Worst Winter on Record," *GEOworld*, Dec. 2002, pp. 38-41.

²⁵ National Aeronautics and Space Administration, Shuttle Radar Topography Mission (SRTM) at [http://www.jpl.nasa.gov/srtm/p_status.htm]. FEMA relies on USGS digital elevation data collected by NASA and international space agency programs. These have been made publically available on a limited basis. See also, "Satellite Imagery Used to Reduce Seasonal Flood Risks," *GEOworld*, Jan. 2002, p. 10, for Canadian Space Agency's applications of IFSAR aboard its Radarsat mission satellite.

Progress Report, which discussed additional short-term management needs for implementing FMMI. This report also focused on contracting from the private sector mapping program administrators, digital spatial data management experts, and managers to oversee FHSs conducted in previously unmapped areas.²⁶

Other unforeseen cost increases resulted from Executive Order 12770, which required that all federal agencies switch from English to metric measurements when calibrating scientific instrumentation, conducting land surveys, and mapping spatial data.²⁷ The May 2001 FMMI Update indicated that FEMA would bear all costs of revising FHSs published prior to the issuance of E.O. 12770, so that older flood map metrics could be made uniform with post-1988 ones; measurements be made more accurate; and “footprints” of map objects be drawn more precisely. FEMA reported that private contractors would be hired to republish pre-1988 FHSs using metric measurements. In addition, FEMA advised affected state and local officials that E.O. 12770 could change historically determined base flood elevation (BFE) in several NFIP communities and result in changes to existing boundaries of Special Flood Hazard Areas (SFHAs) and *regulatory floodways* on FIRMs. (See **Glossary**.)

Despite some changes in the FMMI since August 1999, those cost estimates continued to be used as a baseline for proposed spending in the *May 2001 FMMI Progress Report*. All told, FEMA had projected that total and incremental costs for FMMI from FY2003 through FY2007 would decline by 10% and 14% respectively, as compared with May 1999 estimates. FEMA estimated that fully implemented, FMMI would “prevent \$26 billion in flood damages to new buildings over a 50-year time horizon.”²⁸

FEMA Multi-Year Flood Hazard Identification Plan. In November 2004, FEMA released a Multi-Year [flood] Hazard Identification Plan (MHIP) for FY2004 through FY2008.²⁹ This report detailed a five-year-based schedule and funding requirements for converting old flood hazard data and creating DFIRMs for the most vulnerable communities to flooding. Those figures were presented as projected outlays for FY2003-FY2008 as shown in **Table 2**.

FEMA’s MHIP emphasized that “the map modernization budget must fund data maintenance and technical and program support in addition to map production and

²⁶ *Modernizing FEMA’s Flood Hazard Mapping Program: A Progress Report*, May 2001, sect. 1, p. 4.

²⁷ E.O. 12770, “Metric Usage in Federal Government Programs,” July 25, 1991. FEMA is required to reference pre-1988 flood insurance studies to vertical benchmarks redefined by the USGS National Vertical Datum standard that was revised in 1988 (NAVD88), with respect to base flood elevations published in FIRMs. See Metric Conversion Act of 1975, P.L. 94-168 (15 U.S.C. §205(a) *et seq.*), as amended by §5164 of the Omnibus Trade and Competitiveness Act of 1988, P.L. 100-418.

²⁸ *Modernizing FEMA’s Flood Hazard Mapping Program*, May 2001, sect. 1, p. 2.

²⁹ *FEMA, Multi-Year Hazard Map Program: Acquisition Plan and Acquisition Program Baseline* (Washington, D.C: May 2004).

distribution.”³⁰ The agency reclassified former FMMI budget categories to reflect the goals of the new scheduling plan. However, except for addition of FY2008 figures, totals obligations did not differ significantly from May 2001 estimates.

**Table 2. Revised Projected Annual Spending for FMMI
(FY2003-FY2008)**

(\$ millions)

Description	FY2003- FY2004	FY2005	FY2006	FY2007	FY2008	Total
Engineering/Mapping	364	188	194	200	206	1,152
Customer Care & Outreach	16	20	20	20	20	96
Technical Support/Systems & Tools	42	20	15	13	10	100
Program Management Support	27	25	25	25	25	127
Total Spending	\$449	\$253	\$254	\$258	\$261	\$1,475
Cumulative Spending	\$449	\$702	\$956	\$1,214	\$1,475	—

Source: FEMA, *Multi-Year Flood Hazard Map Program: Acquisition Plan and Acquisition Program Baseline*, May 2004.

The MHIP indicated that funding would be distributed for specific flood hazard studies and flood map production for the most vulnerable counties mentioned in the report and ranked by priority. Funding would not be disbursed en bloc to states or directly to local governments but instead to private contractors who participate as Cooperative Technical Partners (CTPs) in NFIP communities. In this way, FEMA stated, channels could be opened to leverage costs of DFIRM development. Also, FEMA noted that contributions from CTPs could increase the value of the final product (DFIRMs) in the long-run, such as for commercial applications, while augmenting the volume of local spatial data resources made available to the federal government for future DFIRM updates. FEMA did not attempt to quantify what those future benefits might be or how they might affect future costs of FMMI, however.³¹

To assist in developing annual spending plans for FMMI through FY2006 and beyond, FEMA reported that it would concentrate on developing reliable national flood data sets.³² FEMA stated that by providing state and local governments and the private sector access to federal spatial data, an incentive would be created for the latter to exchange local and regional spatial data/maps to the federal government. It noted further that based upon increasing demands for access to federal spatial data and maps — which would be limited to only those entities that could provide local

³⁰ FEMA, *Multi-Year [flood] Hazard Identification Plan*, FY04-FY08 (Version 1.0), “Distribution of Funds to the Region,” Sect. 3, pp. 1-9.

³¹ *Ibid.*, Sect. 3, p 1.

³² *Ibid.*

data/map resources in digital format for DFIRMs in return — the response would provide the agency a sense of where resources for local flood mapping should be distributed to lesser economically advantaged communities throughout FEMA’s 10 regions.³³

Federal Assistance, FMMI Partnerships, and Community Outreach

Historically, FEMA has used spatial (geographic) and environmental data and information about local communities acquired from land surveys, local maps, and public records, such as property tax assessments, provided by local authorities as part of the Flood Hazard Study (FHS) process. FEMA officials note that these resources, for the most part, have been available at little, if any, cost to the agency. Also, because FEMA requires a FHS and subsequently a Digital Flood Insurance Risk Map (DFIRM) be produced before a community can be accepted in the National Flood Insurance program (NFIP) and, because the FHS provides the means for FEMA’s Federal Insurance Mitigation Administration (FIMA) to set local federal flood insurance rates and areal coverage, it considers contributions of local flood hazard data and mapping a reasonable exchange for federal flood insurance coverage, and a reciprocal benefit to be shared among state and local government officials.³⁴

Many communities participating in the NFIP were concerned when conversion to digital flood maps was outlined in President Clinton’s FY1999 budget request. In his budget he indicated that “all new FIRMs and those in need of updating would be produced digitally, beginning with that fiscal year’s procurement.”³⁵ It appears that concerns and confusion still affect newly mapped communities and established ones overdue for flood map updates. In July 2005, a Government Accountability Office (GAO) official testified that

According to FEMA ..., if affected property owners do not understand why their communities are being mapped (or re-mapped) or why their property is now in a flood zone, the unexpected additional expense of new or increased flood insurance premiums can form the basis of significant community opposition to map modernization activities and lead to formal appeals, litigation, and delays in implementing map changes.³⁶

³³ Ibid. See also *FEMA Regions* at [<http://www.fema.gov/regions>].

³⁴ Association of State Floodplain Managers, Inc., “The Future of the National Flood Insurance Program,” testimony of Chad Berginnis ... before the Senate Committee on Banking, Housing, and Urban Affairs, Oct. 18, 2005, available at [<http://www.floods.org>].

³⁵ Office of Management and Budget, *Budget of the United States Government for Fiscal Year 2000* (Washington: GPO, 1999).

³⁶ U.S. Government Accountability Office, *Flood Map Modernization: Federal Emergency Management Agency’s Implementation of a National Strategy*, “Statement of William O. Jenkins, Jr., Director, Homeland Security and Justice Issues before the House Subcommittee on Housing and Community Opportunity, Committee on Financial Services,” GAO-05-894, (continued...)

When FEMA had released its first *Map Modernization Progress Report* in September 1999, and announced that *all* FIRMs would be converted to DFIRMS by the end of 2007, many county and local community governments realized that they could be facing mandatory flood map revisions imminently, or at any time over the following seven years. These authorities, local businesses, and citizens alike anticipated economic hardship if federal flood insurance coverage were to be affected and if FEMA were to revoke eligibility for it after digital flood map revisions were made. (See **Figure 1**.) Early opponents of the initiative argued that they were already strained financially and struggling to comply with previous federal unfunded mandates, while trying to achieve their own economic goals with limited fiscal resources. Although some private surveying and mapping enterprises stood at the ready to provide digital flood map-related assistance to local authorities; few, if any, contracts were awarded.³⁷

FEMA officials tried to convince potentially affected parties that the new digital mapping requirements were not intended as a financial burden for local governments, or individual citizens, but meant to ensure the public safety and limit financial losses in areas vulnerable to potential flooding hazards. As an incentive to gain public acceptance of FMMI, FEMA flood mapping partners urged the agency's heads to seek federal funding for non-reimbursable grants to states and channel direct funding to more economically challenged communities.³⁸ In that way, communities could be availed of private sector digital mapping services and assist with local DFIRM development.

FEMA had reported from the outset that the FMMI would be a capital-intensive venture initially; not only because of the costs associated with building an operational infrastructure for producing and managing DFIRMS, but also because of having to retain professional digital mapping expertise to provide FEMA the capacity to convert its remaining paper FIRM inventory to a digital one. In its May 2001 *FMMI Progress Report*, FEMA announced that private sector contractors would perform new flood hazard studies (FHSs) and manage other flood map modernization activities. It also stated that professional cartographers would be retained to certify the precision and accuracy of DFIRMS. (See "Technological Challenges.")

³⁶ (...continued)

July 12, 2005 (Washington, DC: July 2005).

³⁷ A number of private companies provide "certified" flood hazard determinations for private property owners using pre-certified FEMA mapping data which are in the public domain. These services are directed to individual homeowners or businesses who wish to accurately validate the location of their property on FEMA flood maps to challenge a FEMA flood hazard determination. See, for example, FloodSource.com: Flood Hazard Information at [<http://www.floodsource.com/FSW/servlet/FswServlet>].

³⁸ FEMA, *Flood Map Modernization Progress Report*, May 2001.

Figure 1. Example of Economic Impact of FMMI: City of San Mateo, California

“Changing Flood Zones Increases Insurance Costs: San Mateo Neighborhood Victim of Flood Map Restructuring,” abc7news.com, October 17, 2001. This article discussed how, in San Mateo, California, more than 6,000 homes were retrospectively designated as being in a flood hazard zone by FEMA. A previous FHS for the area completed in 1993 showed no flood risk. However, after the Army Corp of Engineers issued new federal engineering standards for levees and flood control canals, FEMA found one levee in the community to be structurally too low to prevent flooding. Without retrofitting the levee, the community would be in violation of the NFIP and might lose federal flood insurance coverage altogether. FEMA instructed San Mateo's Director of Public Works to retrofit the levee and, in the meantime, the community would have to accept the new flood hazard determination, meaning increased flood insurance coverage. As a gesture, FEMA offered reduced Pre-FIRM rates for those who responded within a proscribed time limit. That notwithstanding, FEMA would be required to revise the city's SFHA boundaries. Because this determination was made after the FMMI plan went into effect, the new map would be required to be produced as a DFIRM. Higher insurance rates, engineering costs, having to provide local data and maps in digital format, would leave the the community economically challenged.

Although the city has spent about \$6 million to date, it is estimated that they will need to raise an additional \$22.5 million to complete all projects, to achieve the goal of being completely removed from FEMA SFHA determination by engineering means. For an overview of what measures the city's Public Works Department has taken since to reduce flood vulnerability and lower its insurance rates, see “FEMA Flood Insurance Rate Update” at [<http://www.cityofsanmateo.org/dept/pubwks/fema.html>] accessed January 27, 2006.

Because FEMA recognized it would likely assume most of the financial costs of FMMI, it has sought to distribute available funding where it is needed most. In FY2003, the Bush Administration announced a “new direction” for the federal flood mapping program which was premised on Congress appropriating \$300 million in aggregate for FMMI through FY2008. (See **Table 1.**) FEMA officials described the “new direction” as not all that new, because some NFIP-participating communities had already or were implementing the FMMI with federal assistance. The FY2003 request stated that a new direction would require FEMA to (1) implement DFIRM standards nationally; (2) broaden public outreach to encourage federal flood insurance program participation; and (3) allocate federal funding for DFIRM development “more equitably and consistently across NFIP communities.”³⁹ The strategies proposed by FEMA were as follows:

- provide matching grants to state and Native American tribal governments for purchasing digital surveying tools and automated mapping technologies and support robust digital mapping efforts in progress

³⁹ FEMA, *Flood Map Modernization Initiative Progress Report*, May 2001.

- provide direct funding or non-reimbursable grants to financially challenged local government jurisdictions to retain private sector land surveying, digital data collection, digital map production services, and to digitally convert local maps and spatial data
- provide “in-kind” advisory services to any community that requested them and to detail FEMA or FEMA-contracted employees to assist in managing the FMMI workload in the field
- enlist technical assistance from other federal mapping agencies, such as USGS, as needed
- contract directly with private land and aerial surveying and mapping firms on behalf of communities to collect geographic data for DFIRM updates, revise earlier FHSs, and undertake new FHSs in flood-prone areas which have not had previous flood risk assessments

Although FEMA and federal budget managers would have preferred to have larger financial contributions from, work responsibilities shared with, and digital data provided gratuitously by non-federal entities, the prospect for raising resources from local authorities to offset any significant proportion of federal funding needed to implement and sustain the FMMI would be low. FEMA concluded that it would need to employ different combinations of all of the above strategies on a case-by-case basis to attain its long-term FMMI’s goal.

State, Tribal, and Local Government Assistance

Communities that are financially challenged but in imminent need of federal flood insurance coverage have been able to apply for federal grants or receive flood map-related services directly from FEMA, based on needs. Such services have been provided for specific projects, including preparing flood hazard boundary maps (pre-FIRMs) as a prerequisite for timely flood disaster payments, and subsequently for conducting FHSs in the aftermath of a presidentially declared flood disaster in areas that were not previously mapped. Funding is provided for such from the FEMA Disaster Relief Fund (DRF) and made available through FEMA’s Flood Insurance and Mitigation Administration (FIMA). In addition, FEMA has extended various classification of grants to state and tribal governments to address natural disasters.

Federal grants and in-kind services for non-emergency flood mapping for implementation of the FMMI are funded by the Flood Map Modernization Fund (FMMF), which, since FY2003, is an annual discretionary appropriation for FEMA. Prior to FY2002, flood disaster mitigation assistance was provided under FEMA’s Project Impact.⁴⁰ Criteria for eligibility for assistance were developed through a congressionally authorized Cooperative Technical Partners (CTP) program, which is still active under FEMA. Since FY2002, funding for pre-disaster mitigation grants

⁴⁰ Begun in 1997, FEMA’s Project Impact was funded at around \$25 million annually to address local community mitigation projects for all types of natural and man-made disasters. Funding for Seattle Project Impact was provided through a grant from FEMA to the “City of Seattle Emergency Management.” See [<http://www.cityofseattle.net/projectimpact/>]. (See also “FEMA Community Outreach,” below.)

(PDMG) has been authorized by Title II of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (“The Stafford Act,” 42 U.S.C. 5121) and those grants are extended en bloc to states. The PDMGs primarily assist local emergency management authorities in developing disaster mitigation strategies for *all* natural disasters including, hurricanes, tornadoes, wind and water damage, fires, and earthquakes, and terrorist acts. FEMA allocated grants to state and tribal governments who determine how PDMGs will be used to address all possible disasters in their respective emergency planning. There can be stiff competition among states’ various disaster mitigation programs for use of PDMGs. In some states, these have been used to fund county-based FMMI projects such as (1) complying with NFIP-regulated flood map requirements; (2) mitigating localized flood hazards; and (3) minimizing potential economic losses for small businesses due to flooding.

Some states have independently launched digital hazards mapping initiatives. In some cases these are helping to identify flood risks, landslides, and earthquake zones among other “geohazards” within county jurisdictions. Although some have been assisted with FEMA grants, which require state funding matches, other states have funded projects entirely on their own. North Carolina’s success is often presented as a model state for its accomplishments. Prompted by the disaster left in the wake of Hurricane Floyd in 1999, North Carolina began compiling digital spatial data and producing maps at geographic scales that are also important for DFIRM development and for future revisions (updates). However, it is not alone.⁴¹ Many state mapping programs now operate with an “open GIS” policy for data and map sharing. Access to state-collected and compiled spatial data, and digital hazard maps produced from them, is virtually free or available at minimal cost of reproduction.

FEMA program managers have recognized that partnerships with accomplished state digital mapping programs could reduce the costs of implementing the FMMI in the long run, because of unrestricted access to and use of local data and maps to produce new DFIRMs or revise them in the future. One possible outcome could be an opportunity for FEMA to have reciprocal arrangements with states providing digital data and maps for DIRMs, whereby the agency would help those states to offset costs of other nationally important natural hazard risk assessment map projects, such as for identifying seismic hazards, landslides, and coastal-zone flooding. Alternatively, FEMA might “repay” states in-kind by providing disaster response training for local emergency management officials and first responders, and preparedness and safety training for the public within the local community.

⁴¹ Washington State, South Carolina, et al.

FEMA Community Outreach

Other types of assistance FEMA provides are Hazard Mitigation Program Grants (HMPGs) and Flood Mitigation Assistance Grants (FMAGs). These are for post-flood disaster repairs and retrofits, such as elevating or reinforcing structures. In-kind services are provided through the Cooperating Technical Communities (CTC) partnerships developed under Project Impact.⁴² With respect to HMPGs and FMAGs, FEMA's role has been to work directly with state, tribal, and local emergency managers through CTCs to (1) develop mitigation strategies to minimize potential flood hazards; (2) educate and prepare local citizens for flood emergencies; (3) assist communities in assessing post-flood damage; and (4) help restore "critical" services (medical, fire, police, etc.) soon after a flood disaster.⁴³

In FY2002, President Bush requested and Congress established the Pre-Disaster Mitigation Grant (PDMG) program managed by FEMA under the Emergency Preparedness and Response Directorate (EPRD) of DHS.⁴⁴ Since FY2003, The Flood Insurance and Mitigation Administration (FIMA) has extended flood disaster mitigation (FDM) grants through the "Community Assistance Program: State Support Services Element (CAP-SSE)" that was created to encourage greater participation of flood-prone communities in the NFIP.⁴⁵ Another form of FEMA assistance to local communities has been the Emergency Management Performance Grants (EMPGs) authorized by the Stafford Act. EMPGs are extended to improve the infrastructure and administration of local emergency response, but can also be used by local government officials to implement disaster mitigative *processes* (e.g., promulgating regulations requiring standardized building codes, or funding studies to minimize flood hazards as part of local or regional emergency planning).⁴⁶

⁴² A final progress report, released in May 2001, focused on the Cooperating Technical Partners (CTP) initiative with respect to strengthening and coordinating federal-state-regional-local government and private sector partnerships for FMMI. It also reviewed work of the TMAC established to advise FEMA about the future of flood map programs. See National Research Council, *Spatial Data Needs: The Future of the [USGS] National Mapping Program* (Washington, D.C.: National Academy Press, 1990).

⁴³ See 42 U.S.C. §4101 et seq., "Chapter 50, Subchapter III, Coordination of Flood Insurance with Land Management Programs in Flood Prone Areas." This section of the Code authorized FEMA to enter into disaster mitigation partnerships, after Project Impact was terminated in FY2001, for the Pre-Disaster Mitigation (PDM) program created by Title II of the Stafford Act. PDM grants, issued *en bloc* to state governments, were funded at \$25 million beginning in FY2002.

⁴⁴ U.S. Congress, House of Representatives, *VA, HUD, and Independent Agencies Appropriations, 2003*, report to accompany H.R. 5605, 107th Cong., 2nd sess. H.Rept. 107-740 (Washington: GPO, 2002), pp. 133-134.

⁴⁵ Originally published in *Catalog of Federal Domestic Assistance*, June 2002. "83.105 ... CAP-SSSE."

⁴⁶ American Rivers, *Floodplain protection toolkit — resource materials*, "PDM initiatives include relocating people out of flood-prone areas, promoting restrictions on floodplain development, and restoring riverine habitat, and modernizing flood maps." Archived at [http://www.americanrivers.org/site/PageServer?pagename=AMR_content_1da1].

Commercial Ventures and Federal Contracting

Organizations representing corporate and small mapping enterprises have testified before Congress about private sector capabilities to perform land surveys, aerial photography, and flood map determination services, which many of them have been doing for local community governments as Cooperating Technical Partners (CTPs). They are eager for business generated from FEMA's nationwide implementation of FMMI.⁴⁷ Some of these already perform such work under contract to FEMA, and foresee a groundswell of opportunities that a multi-year stream of federal funding for flood map modernization could generate.⁴⁸

Other private enterprises likewise have business interest in the FMMI, including vendors of digital mapping technologies, such as geographic information systems (GIS), digital surveying equipment, and hand-held GPS locating devices. Some provide services such as aerial photography. Still others specialize in digital map conversion or market industrial size optical scanners which can almost instantly convert large paper maps to digital map files. Aerospace industries market high-end technology such as LIDAR and IFSAR used for collecting data by remote sensing data. Businesses with aircraft that serve as platforms for such instruments also stand to benefit as FEMA moves closer to wholesale remote sensing for environmental and geophysical digital data collection needs.⁴⁹

FMMI supporting industries who work under contract to FEMA argue that the initiative can be a boon for the U.S. economy in many ways, including the following:

- returning federal taxpayer investments in flood prevention many times over

⁴⁷ Bryan J. Logan, Photo Science, Inc., for the Management Association for Private Photogrammetric Surveyors (MAPPS), "Opportunities for Management Reforms at NOAA," Apr. 24, 1997. Written Testimony prepared for the Senate Subcommittee on Oversight of Government Management, Restructuring, and the District of Columbia. MAPPS is a lobbying group on Capitol Hill. Logan stated that aerial photography, used to produce topographic, planimetric, and other forms of maps, is a commercial activity and is provided by some 250 firms in the United States. He added that NOAA, the Corps of Engineers, Geological Survey, Forest Service, and Federal Highway Administration have active contracting programs to obtain such services from the private sector.

⁴⁸ "FEMA Selects AMEC [p.l.c.] for Flood Studies," *PR Newswire*, p.1 (New York: Oct. 10, 2001). "Under the indefinite delivery contract with FEMA, AMEC will perform up to \$10 million in services necessary to conduct new and updated flood studies for communities throughout FEMA Region III ... to update old, inadequate, and often times inaccurate flood-hazard maps and to study and map some flood-prone communities for the first time."

⁴⁹ MAPPS is a national association representing firms in the surveying, spatial data and geographic information systems field in the United States. Its members are engaged in surveying, photogrammetry, satellite and airborne remote sensing, aerial photography, hydrography, aerial and satellite image processing, GPS and GIS data collection and conversion services. MAPPS urges Congress to require that the federal "government increase contracting out to private firms and reduce agency competition that is less efficient than the private sector." See MAPPS website at [<http://www.mapps.org/aboutus.htm>].

- reducing flood disaster relief costs and lower flood insurance premiums
- enabling a national clearinghouse of shared digital spatial data resources
- structuring a distributive hazard risk analysis infrastructure within local communities
- maintaining currency and classifying local spatial data and mapping resources for periodic DFIRM revisions.⁵⁰

Technological Challenges

DFIRMs production can be complex, costly, and labor intensive if local digital data or maps needed to produce them are not available. These electronic maps compile diverse spatial data — digital and otherwise — from many different sources. The maps used to develop DFIRMs can be generated at different geographic scales (e.g., local community, county, incorporated city limits, or watersheds) and be compiled for user-specific purposes. Map objects (e.g., buildings, highways, canals, dams, and levees) need be assigned precise geographic coordinates for flood insurance purposes. As a result, disparate geospatial data and maps need to be reconciled and normalized or, according to professional cartographers (map makers), be “registered” with the map scales used by USGS-certified digital maps. Although registering a map requires cartographic expertise, the time consuming, simple manual digitizing (tracing) of the “footprint” and boundaries of maps objects on paper flood maps can be performed by a qualified mapping technician. Even so, a USGS mapping expert would likely have to certify the digitized end product, possibly requiring further “massaging” by cartographers.

FEMA has hired Mapping Coordination Contractors (MCCs) to register digital images, integrate diverse digital spatial data, and also digitize line maps to ultimately produce a DFIRM. The “layering” of a series of data standardized by the USGS creates a “framework” upon which all map objects will be depicted at the same geographic scale.⁵¹ The base map used is a USGS visual map called a Digital Ortho Quad (DOQ), which depicts earth surface areas of 7.5° x 7.5°. Other products of differing resolution and scale that require registration include local line maps and low-altitude aerial photography.

In the spring of 2002, FEMA established a Map Needs Assessment Team (MNAT), which it also chairs. MNAT found that FHSs were still required for about 2,700 previously unmapped flood-prone communities.⁵² The assessment teams’

⁵⁰ For description of available analytical tools for flood disaster planning, see “Flood Hazard Mapping: Software,” at [http://www.fema.gov/fhm/frm_soft.shtm].

⁵¹ For more information about the role of MCCs, see Joshua Price and Tom Schweizer, P.E., “Before the Deluge: FEMA, Floodplains, and GIS,” *Geospatial Solutions*, Oct. 2002, pp. 38-42.

⁵² Section 575 of 1994 NFIPRA (P.L. 103-325) required a “Mapping Needs Assessment (continued...)”

ongoing responsibility has been to schedule and plan for routine five year updates of DFIRMs. The five-year cycle has actually been required since the 1963 NFIPA was amended in 1994 by the NFIPRA.⁵³ On October 4, 2005, at a briefing of the Senate Banking Committee on the National Flood Insurance Program, committee staff present expressed concerns that FEMA has not been able to keep pace with legislatively-mandated five year updates for flood maps. Specifically, their concerns were about recent flooding in Gulf of Mexico states in the aftermath of Hurricane Katrina, and whether more timely updates might have prevented some flood losses. FEMA has acknowledged that it does not have the manpower to meet all flood map revision requirements. Instead, it will prioritize its resources for updating maps for post-flood emergency updates, areas of potential flood risk losses, and facilitating the FHS process in previously unmapped areas. (See “Multi-Year Flood Hazard Identification Plan.”)

Reorganization of FEMA and Possible Changes to the FMFI

FEMA was originally established by President Carter’s Reorganization Plan No. 4 of 1978 as an independent federal agency. Since March 2003, however, it has operated under the management of the DHS Emergency Preparedness and Response Directorate. FEMA’s mission is to provide a coordinated federal response and recovery operation for disasters occurring in the United States. This includes coordinating disaster response with other federal agencies and state and tribal government and issuing federal disaster relief payments and recovery services to victims of Presidentially declared disasters.⁵⁴

In 1979 FEMA assumed management of the National Flood Insurance Program (NFIP) and the associated flood hazard mapping program. In addition, FEMA monitors, compiles, and acts on disaster-related information contributed by other federal agencies such as seismic alerts from the U.S. Geological Survey (USGS) and severe weather warning and tsunami detection from the National Oceanic and Atmospheric Administration (NOAA). FEMA’s other responsibilities have included maintaining liaison with state, tribal, and local and international government

⁵² (...continued)

Process (MNAP)” to document all map update needs nationally on a five-year cycle and to develop cost estimates (including for engineering, mapping, production printing, and distribution costs). MNAP was conceived by the MNAT and is supported by an automated Map Needs Update Support System (MNUSS) for scheduling DFIRM updates.

⁵³ 42 U.S.C. §4101(e) Identification of flood-prone areas, Review of flood maps: Once during each five-year period (the first such period beginning on Sept. 23, 1994) or more often as the Director determines necessary, the Director shall assess the need to revise and update all floodplain areas and flood risk zones identified, delineated, or established under this section, based on an analysis of all natural hazards affecting flood risks.

⁵⁴ See 95th Cong., 2nd sess., 1978 *USCCAN*: 9808. For further information about FEMA’s present federal role, see CRS Report RL33064, *Organization and Mission of the Emergency Preparedness and Response Directorate: Issues and Options for the 109th Congress*, by Keith Bea.

emergency management officials, exchanging information, and alerting them of imminent or potential disasters. FEMA works with the media for emergency warnings. It coordinates federal emergency response and evacuation at the behest of affected states by supporting regional and local government authorities. It also performs post-disaster risk assessment providing input for future building code modifications.

FEMA's functions have expanded over time. Beginning in 1994, under the Clinton Administration, the agency was authorized to assist various communities with mitigating hazards associated with natural disasters (pre-disaster mitigation), either by extending federal grants to states and tribal governments or by funding to at-risk populations directly.⁵⁵ FEMA's flood-related role also grew to include visibility in the community, where on-site agents work directly with state and local officials. FEMA fieldwork includes "in-kind" services such as (1) educating authorities at all levels of national government about disaster response and advising them in emergency management and planning; (2) training local floodplain managers, land-use planning agencies, and prospective emergency management personnel about how to assess local flooding risks and damage in the aftermath; and (3) assisting with local officials to conduct public education campaigns, such as promoting individual citizens' awareness of flood dangers and how to prepare for them.

Criticism of FEMA's effectiveness catalyzed by two successive damaging hurricane seasons for the Gulf of Mexico and Florida has prompted Bush Administration officials and some U.S. lawmakers to consider whether the agency is properly poised to handle such disasters. If the current status of FEMA were to change, stakeholders have asked how might the FMMI and FEMA's flood map program be affected?

Department of Homeland Security Reorganization. In July 2005, when Michael Chertoff was confirmed as Director of the DHS, he proposed reorganizing the agency structure created by his predecessor, Former Governor Tom Ridge of Pennsylvania.⁵⁶ Known as the 2SR initiative, Chertoff's proposal directs FEMA to report directly to him rather than the head of the Environmental Preparedness and Response Directorate (EPRD). He continues to support the change of status of FEMA in keynote addresses given at various meetings he has attended.⁵⁷ Chertoff has stated that FEMA would return to focusing on coordinated national response to

⁵⁵ The Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C. 5121 et seq., See CRS Report RL33053, *Federal Stafford Act Disaster Assistance: Presidential Declarations, Eligible Activities, and Funding*, by Keith Bea.

⁵⁶ U.S. Department of Homeland Security, "Secretary Michael Chertoff, U.S. Department of Homeland Security Second Stage Review Remarks," Ronald Reagan Building, Washington, DC (July 13, 2005), pp. 1-2, available at [<http://www.dhs.gov/dhspublic/display?theme=44&content=4597&print=true>].

⁵⁷ "Remarks by Secretary Michael Chertoff, U.S. Department of Homeland Security at the Association Fire Chiefs Leaders Summit, Washington, DC, Nov. 4, 2005," available at [<http://www.dhs.gov/dhspublic/display?theme=44&content=4926&print=true>]. "First we must re-tool FEMA and enhance this vital agency's capabilities ... supporting response and recovery."

disasters, natural or human-induced, provide disaster relief payments and recovery services for individuals, and assist economic recovery in disaster affected areas.⁵⁸ In that event, FEMA would no longer head pre-disaster mitigation efforts and assistance.⁵⁹ The 2SR plan was released prior to Hurricane Katrina striking the northern Gulf coast on August 29, 2005. Widespread criticism of FEMA's response to that disaster resulted in a change of leadership at the top of the EPRD.⁶⁰ Public criticism had also been leveled at emergency preparedness and responses to the hurricane of some state and local officials.⁶¹

Options and Alternatives Proposed for FEMA. Under the 2SR Initiative FEMA is to divest its disaster prevention and mitigation functions, which Director Chertoff now views as a separate mission. Its long-term partners are now questioning the fate of the Flood Map Modernization Initiative. Negative feedback about FEMA's response to Hurricanes Katrina and Rita has prompted some Bush Administration officials to propose dismantling FEMA entirely. They favor introducing different options for the U.S. government for conducting national emergency management operations. For example, some Department of Defense officials are advocating a coordinated national emergency management response led by the U.S. military.⁶² Others have suggested that FEMA return to being an independent agency with cabinet-level status as it stood prior to its transfer to DHS.⁶³ However, critics of the deconstruction of FEMA, or establishing it as an independent agency, assert that close collaboration and communication between FEMA and the DHS for reasons of national security purposes is vital. They prefer existing synergies at DHS that meld natural disaster and terrorism response activities, which Director Chertoff's plan would foster.

⁵⁸ Ibid. “[W]e intend to integrate the Departments existing preparedness efforts ... into a single directorate for Preparedness.”

⁵⁹ Ibid. “FEMA will become a direct report to the Secretary [of DHS], allowing it to focus on response and recovery....”

⁶⁰ U.S. Government Accountancy Office, *Preliminary Observations on Hurricane Response to Hurricane Katrina*, Statement of Comptroller General David M. Walker, GAO Report, GAO-06-365R (Washington, D.C., Feb. 1, 2006).

⁶¹ Gov. Kathleen Babineaux Blanco, “Rebuilding Louisiana,” speech delivered Sept. 14, 2005. “We all know that there were failures at every level of government: state, federal and local.

At the state level, we must take a careful look at what went wrong and make sure it never happens again. The buck stops here. And, as your governor, I take full responsibility.” See [<http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&catID=4&articleID=871&navID=13&printer=1>].

⁶² Office of the Press Secretary, “Press Gaggle with Scott McClellan Aboard Air Force One En Route Andrews Air Force Base, Maryland, Sept. 25, 2005. Available at [<http://www.whitehouse.gov/news/releases/2005/09/print/20050925-2.html>].

⁶³ Office of Senator Hillary Clinton, “Clinton Unveils Legislation to Restore FEMA to Independent Status: And Launch Katrina Commission to Investigate Hurricane Recovery Efforts,” Press Release, September 6, 2005. “The legislation will ... restore FEMA to cabinet-level ... the FEMA director would report directly to the President.” available at [<http://www.dlc.org/print.cfm?contentid=253525>] accessed Jan. 27, 2006.

National Flood Mapping-Related Issues. A core concern for the FMMI if FEMA's status as an agency were to change is the mutual dependency of the flood mapping program and the Flood Insurance and Mitigation Administration (FIMA). Some argue that FMMI is practically privatized now, given that flood hazard studies (FHSs), flood hazard determination validation, and some flood map modernization management responsibilities are wholly managed by private contractors. Some in the Bush Administration have suggested that production and distribution of flood maps be transferred to the USGS or another federal mapping agency. Nevertheless, that would still require coordination with FIMA or its equivalent entity if FEMA were to be disestablished. Federal flood insurance rates would still have to be determined based on flood risk with the flood map as the critical tool of determination.

Decentralizing the flood map program or transferring it wholesale to another federal mapping agency could diminish the flood map program's profile due to established mapping responsibilities and priorities of its new host.⁶⁴ Also, concerns are that federal discretionary funding for flood mapping programs and the importance of FMMI implementation could diminish.⁶⁵ Existing synergies between flood mapping, flood map modernization, and FIMA operations within FEMA have prompted many emergency management professionals to question such an action.⁶⁶ FEMA's current successes with FMMI and the flood mapping program have resulted from long-established partnerships within NFIP communities. Concerns are that CTPs forged over time could be undermined. Finally, some argue that maintaining the status quo, or continuing FEMA's management may make sense, because: (1) operations of the flood map modernization program and DFIRM-related services is now well-established; (2) there is an associated integral processing infrastructure; and (3) it maintains a highly rated customer services center, all of which point to successful administration by the agency.

A popular solution appears to be elevating FEMA, including all of its current responsibilities and functions (including disaster prevention and mitigation), within DHS through the establishment of a Natural Hazard Mitigation, Response, and Recovery Deputy Directorate reporting directly to Director Chertoff. While similar to 2SR, it would ensure that preparation, mitigation in addition to response, and

⁶⁴ Association of State Flood Plain Managers, Inc., "Testimony," Oct. 18, 2005.

⁶⁵ Ibid.

⁶⁶ U.S. Congress, House Committee on Government Reform, *The Homeland Security Department's Plan To Consolidate and Co-locate Regional and Field Offices: Improving Communication and Coordination*, Joint Hearing of the Subcommittee on Energy Policy, Natural Resources and Regulatory Affairs, and the Subcommittee on National Security, Emerging Threats and International Relations, March 24, 2004 (Serial No. 108 — 168, Washington, DC, GPO, 2004). Testimony of James Lee Witt, former Director of FEMA, pp. 92-94, "I want you to know that I and many others in the emergency management community across the country are deeply concerned about the direction FEMA is headed. First, we are greatly concerned that the successful partnership that was built between local/state/federal partners and their ability to communicate, coordinate, train, prepare, and respond has been sharply eroded." He continued, "I felt that many of the pieces in place to manage the consequences of a disaster or terrorist attack were not broken and didn't need "fixing." I saw no need to reinvent the wheel...."

recovery functions of FEMA remain intact. Proponents of this approach argue that FEMA would assume a higher profile within DHS, while maintaining traditional long-standing agency culture and partnerships developed between state, tribal, and local government officials and the private sector. From their perspective, instead of becoming an independent agency, FEMA would be in a position to share resources and expertise with other directorates of DHS that deal more closely with terrorism-related disasters.⁶⁷

Conclusions

The development of FEMA's digital flood maps, or DFIRMs, continues under the Flood Map Modernization Initiative (FMMI), although some critics might contend that implementation has not been timely or uniform. FEMA was authorized by Congress to build an inventory of more than 100,000 digital flood hazard maps. Completion of digital conversion is now expected by the end of 2008.⁶⁸ President Bush wants to make most, if not all, of these digital flood hazard maps available on the Internet, so commercial uses of DFIRMs might help to recoup some of the costs of FMMI.

FMMI stakeholders, which include state, tribal, and local government officials, flood plain managers, land-use planners and developers, and mapping professionals generally concur with FEMA's position that a wholesale conversion of paper flood maps to DFIRMs may in the long-run reduce costs of flood insurance coverage for the federal government. They foresee a reduction of flood insurance claims throughout the nation because of production and easy updating of digital flood maps. FEMA flood mapping partners working through Community Technical Partnerships (CTPs), and who many are also stakeholders, attribute possible future savings to the federal flood insurance program because of three technological developments, which FEMA now routinely employs to identify and designate flood hazard risk areas on DFIRMs. These include (1) automated tools for geographical and environmental analysis; (2) more precisely calibrated digital data collected by ground and space-based remote sensing instrumentation; and (3) more accurate metric spatial data measurements. All of these, they say, will complement the process of setting federal flood insurance premiums in the near-future, perhaps as soon as the next five years.⁶⁹

Shortly after the FMMI was launched, FEMA encountered economic barriers in implementing FMMI, because of unmet expectations in leveraging program costs with non-federal entities. Initially, many economically challenged communities protested that the FMMI would result in financial hardships locally. Economically challenged and advantaged communities alike are concerned about the results of digital map conversion, and whether the new DFIRMs could mean higher premiums. Local officials anticipated cases where some citizens or entire communities might

⁶⁷ Association of State Flood Plain Managers, 2005.

⁶⁸ Appropriations of \$150 million for FMMI were authorized in FY2003, one fiscal year later than anticipated.

⁶⁹ Association of State Flood Plain Managers, Inc., "Testimony," Oct. 18, 2005.

become ineligible for federal flood insurance based on a private structure's "footprint" such as a home, barn, or other structure redrawn on a DFIRM.

By May 2001, FEMA recognized it would have to finance most of the activities necessary to complete the FMMI. As it stands, FEMA has offered matching grants to states and tribal governments to encourage digital mapping programs undertaken independently of the federal government contingent upon at least a 20% match of funding. Non-reimbursable grants have been provided directly to some economically challenged local communities in hopes of jump starting FMMI through the creation of new NFIP communities and new CTPs. FEMA officials consider these types of federal assistance tools for sharing FMMI's cost in the long-run. They say that by providing incentives for greater participation of all levels of government in the FMMI, the federal government's payoff will be gaining access to local digital data and information and cooperation from local partners, a situation that is necessary for keeping DFIRMs as current as possible.⁷⁰

Most observers of emergency management believe that achieving the goals of the FMMI will depend upon expanding and reinvigorating Cooperating Technical Partnerships. However, because of uncertainty surrounding FEMA's fate as a federal agency, including whether it will remain within the DHS and continue its same function; be reestablished as an independent agency; have its component programs divested and reassigned to other federal agencies; or cease to exist — some are concerned that implementation of FMMI could be threatened. There are concerns that state, tribal, and local governments might retreat from contributing to a robust sustained federal digital flood map program. FEMA states that the effectiveness of the recently introduced Multi-Year Flood Hazard Identification Plan (MHIP) that schedules future flood map updates is premised on balancing critical priorities.⁷¹ These include updating out-of-date flood maps, performing FHSs in unmapped areas in immediate danger of flooding, and ensuring that FMMI resources are distributed equitably among present and potential NFIP communities.

Completion of the FMMI, meaning the digital conversion of the entire inventory of FEMA flood maps seemingly is linked to retaining momentum regardless of whether the program emerges in FEMA, or whatever other entity that might administer it in the future. Proponents of the mapping program maintain that it will lead to cost savings for the federal flood insurance program in the future. In any event, most observers assert that effective management of FMMI will require continued collaboration and coordination within DHS and with its local stakeholders.

It should be noted that wholesale digital map conversion and meeting the required five-year cycle for updating DFIRMs are separate goals for FEMA. Although digital conversion of older paper flood maps is now anticipated to be completed by 2008, the process of DFIRM revision (updates) will be ongoing and requires long-term collaboration with state, tribal, and local government authorities and private sector partnerships to obtain the necessary digital contributions. For

⁷⁰ FEMA, Cooperating Technical Partners (CTP), "Flood Hazard Mapping: Why the CTP is Important," at [http://floodmaps.fema.gov/fhm/ctp_main.shtml].

⁷¹ *MHIP*, Nov. 2004.

FEMA (or whatever entity might administer the flood insurance map program in the future), the need to perform flood hazard studies and revise DFIRMs in a timely manner will be critical, especially as new flood hazard risks in potentially flood-prone areas across the nation are discovered, and after flood disasters occur. FEMA's goal is to provide communities at risk for flooding adequate and equitable federal flood insurance coverage.

Acronyms

BFE	Base Flood Elevation
CBRRA	Coastal Barrier Resources Reauthorization Act of 1999
CFHA	Coastal Flood Hazard Area (Zone “V” on D/FIRMs)
CTC	Cooperating Technical Community with FEMA
CTP	Cooperative Technical Partner of FMFI
DEM	Digital Elevation (contour) Model
DFIRM	Digital Flood Insurance Rate Map
DHS	Department of Homeland Security
DRF	Disaster Relief Fund (FIMA)
EPA	Environmental Protection Agency
EPRD	Emergency Preparedness and Response Directorate of DHS
FEMA	Federal Emergency Management Agency
FGDC	Federal Geographic Data Committee (USGS)
FHS	Flood Hazard Study
FIA	Federal Insurance Administration (now FIMA)
FIMA	Federal Insurance and Mitigation Administration (FIMA)
FIS	Flood Insurance Study-now Flood Hazard Study (now FHS)
FMMF	Flood Map Modernization Fund (FIMA)
FMFI	Flood Map Modernization Initiative
GIS	Geographic Information Systems
GPS	Global Positioning System (satellites)
IFSAR	Interferometric Satellite Aperture Radar
LIDAR	Light Detection and Ranging Radar
MHIP	Multi-Year [flood] Hazard Identification Plan
MNAT/P	Mapping Needs Assessment Team/Process
MNUSS	Map Needs Update Support System
NMD	National Mapping Division (USGS)
NASA	National Aeronautics and Space Administration
NFIF	National Flood Insurance Fund (FIMA)
NFIP	National Flood Insurance Program
NFIPA	National Flood Insurance Program Act of 1968
NFIPRA	National Flood Insurance Program Reform Act of 1994
NIMA	National Imaging and Mapping Agency (DOD)
NOAA	National Oceanic and Atmospheric Administration (DOC)
NSA	National Security Agency (White House)
SFHA	Special Flood Hazard Area (“Zone A,” the 100-year flood plain)
TMAC	Technical Mapping Assessment Council
USGS	U.S. Geological Survey (DOI)

Glossary of Flood Hazard Mapping Terms

Definitions extracted, in part, from Federal Emergency Management Agency, *Guide to Flood Maps: How to Use a Flood Map to Determine Flood Risk for a Property*, FEMA Report 258 (Washington, D.C., May 1988.)

Base Flood

The flood having a 1% probability of being equaled or exceeded in any given year; also referred to as the 100-year flood.

Base Flood Elevation (BFE)

The height of the base (100-year) flood in relationship to a specified datum, either the National Geodetic Vertical Datum of 1929 or North American Vertical Datum of 1988.

Coastal Flood Hazard Area (CFHA)

An area of special flood hazards extending from offshore to the inland limit of a primary frontal dune along an open coast, and any other area subject to storm surge and high velocity wave action from storms or seismic sources, which FEMA designates as “Zone V” on flood maps. Sometimes called Coastal High Hazard Area.

Countywide Map

A flood map, such as a DFIRM, that shows flooding for the entire geographic area of a county, including incorporated communities.

Effective Map

The latest FIRM (or DFIRM) issued by FEMA, which is in effect as of the date shown in the title box of the flood map as either “Effective Date,” “Revised ...,” or “Map Revised”

Extraterritorial Jurisdiction

Authority of a community to establish land-use zones and issue building permits in areas outside its corporate limits.

Flood Boundary and Flood Way Map

A flood plain management map issued by FEMA that shows, based on detailed and approximate analyses, the boundaries of the 100-year and 500-year flood plains and the 100-year regulatory flood way. (See **FHBM**.)

Flood Hazard Area/Flood Plain/Flood-Prone Area

Land subject to inundation by water from any flooding source.

Flood Hazard Boundary Map (FHBM)

Initial flood insurance map issued by FEMA that identifies approximate areas of 100-year flood hazards in a community after a flood emergency.

Flood Insurance Rate Map (FIRM)

Insurance and flood plain management map issued by FEMA that identifies areas of 100-year flood hazard in a community. In some areas, the map also shows base flood elevations, 500-year flood plain boundaries and, regulatory flood way boundaries. These maps are referred to as FIRMs, or simply flood maps, by people who work with them frequently. FEMA’s current electronic digital data version of the maps is known as a **DFIRM**.

Flood Insurance Study (FIS)/Flood Hazard Study (FHS)

Engineering study performed by FIMA to identify flood hazard areas, flood insurance risk zones, and to collect other flood data in a community. The Flood Hazard Study (FHS) has become the accepted terminology among professionals.

Flood Plain Management

The operation of a program of corrective and preventive measures for mitigating flood damage, including, but not limited to, emergency preparedness plans, flood-control works, and flood plain management regulations.

Flood Plain Management Regulations

(Land-use) zoning ordinances, subdivision regulations, building codes, special-purpose ordinances, and other applications of enforcement for mitigation of flood damage.

Map Repository

The community's office that stores copies of the Flood Map and Flood Insurance Study report, now the Flood Hazard Study (FHS), and makes them available for review.

National Flood Insurance Program (NFIP)

Federal program to identify flood-prone areas nationwide and make flood insurance available to the owners and lessees of structures on a property in communities that voluntarily participate in the program. Communities may participate in NFIP by adopting and enforcing flood plain management standards consistent with FIMA.

National Geodetic Vertical Datum 1929, North American Vertical Datum 1988

Standard reference planes from which elevations from sea-level are measured. These were established 1929, and updated in 1988 by the federal government. The latter is used by USGS in digital elevation models (DEM) which delineate topographical contours on land surfaces.

Regulatory Floodway

The area defined as the channel of a stream and the adjacent land areas reserved to discharge a 100-year flood without cumulatively increasing the elevation of the 100-year flood more than a designated height (usually, 2-3 feet above BFE).

Riverine Flood Hazard Area

Area subject to inundation by flooding of rivers, streams, and creeks.

Special Flood Hazard Area (SFHA)

Land area that is subject to inundation by a flood that has a 1% or greater probability of being equal to or exceeding the base, or 100-year, flood during any given year.

Undeveloped Coastal Barrier

An area, adjacent to the Atlantic, Pacific, the Gulf of Mexico, or the Great Lakes, where federal flood insurance would not be available for substantially improved older structures or new construction. These areas are designated by the U.S. Fish & Wildlife Service, mapped by USGS, and protected by the Coastal Barrier Resources Reauthorization Act of 1999 (CBRRA) to discourage development in an attempt to preserve dunes, beaches, and wildlife habitats.

Water Surface Elevation

The height in relation to a national vertical datum (or other local datum where specified) of floods of various magnitudes and frequencies in flood hazard areas. In riparian areas it is also known as the river stage. WSE is also the measurement of the maximum height of the flood above the BFE for a given flood at a given site.

Appendix

This appendix summarizes the budget history of the Flood Map Modernization Initiative (FMMI). It provides background on how the program was created by Congress and how funding was originally authorized. It further tracks the President's annual budget and congressional appropriations action from FY2003 through FY2006.

Early Spending Authorization for Flood Map Modernization

In 1994, a National Flood Insurance Fund (NFIF) was established by Congress in the National Flood Insurance Program Reform Act (NFIPA, U.S.C. 42 §5000 et seq.) as a portion of total emergency monies available in FEMA's Disaster Relief Fund (DRF). Administered by the Flood Mitigation and Insurance Administration (FIMA) monies from the NFIF were made available for updating flood maps after a presidentially declared flood disaster emergency.⁷² The NFIF covered costs of (1) developing a preliminary flood hazard map (PFIRM), or crude flood boundary map, so that federal emergency flood insurance coverage could be extended temporarily; and (2) initiating a FHS to assess the potential for a future significant flood hazard risk in the effected community. These were also the first steps in the FEMA process for acceptance in the NFIP, setting federal flood insurance rates, and extending permanent coverage once a FIRM was produced.⁷³

In FY2003, President Bush requested that additional spending for FEMA of \$50 million be authorized to produce digitally updated (or modernized) flood maps (DFIRMs) after a presidentially declared disaster. Also, President Bush proposed that spending authority be offset by a Flood Policy Fee (FPF) imposed on commercial uses of flood maps by mortgage lenders. However, Congress did not approve the FPF. Also, it has not authorized emergency funding for *non-emergency* flood mapping uses since FY2002. Instead, in FY2003, it chose to appropriate funding for federal emergency and non-emergency flood map activities through the FMMF.

Establishment of the Flood Map Modernization Fund. In FY2000, Congress established the Flood Map Modernization Fund (FMMF) in the Department of Veterans Administration, Housing and Urban Development, and Independent Agencies Appropriations Act (VA, HUD, and Independent Agency Appropriations). Emergency monies could be transferred from the DRF to the FMMF, which was created to pay for expeditious digital flood map revisions needed after a presidentially declared flood emergency, through the NFIF. In addition, Congress authorized FEMA limited spending authority through use of income derived from commercial flood map services for non-emergency, risk-averse studies as a prelude

⁷² These funds are authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 106-390. (42 U.S.C. 5121 *et seq.*)

⁷³ As authorized by the 1968 NFIPA (42 U.S.C. §1360(f)(2)). See, U.S. Congress. House, *Makings Appropriations for VA, HUD, and Independent Agencies, Fiscal Year 2000*, conference report to accompany H.R. 2684, H.Rept. 106-379, Oct.13, 1999, p. 42.

to developing digital flood maps for unmapped, risk-prone communities.⁷⁴ Although it appropriated \$5 million initially to establish the FMMF in FY2000, no further appropriation for FMMI activities was forthcoming until FY2003.⁷⁵

Table 3. Spending Authority and Appropriations History for FMMI
(\$ million)

Fiscal years		2000	2001	2002	2003	2004	2005	2006
Source	T	Spending authority			Appropriations			
Request	ne	0.0	17.7	25.0	300.0	\$200.0	200.0	200.1
	e	5.0	15.0	7.0	50.0	—	—	—
House	ne	0.0	0.0	50.0	200.0	200.0	150.0	200.0
	e	5.0	30.0	15.0	—	—	—	—
Senate	ne	0.0	7.0	7.0	100.0	200.0	200.0	200.0
	e	0.0	5.0	0.0	—	—	—	—
Conf.	ne	5.0	17.7	7.0	150.0	200.0	200.0	200.0
	e	0.0	15.0	25.0	—	—	—	—
Final		\$5.0	\$32.7	\$32.0	\$149.0	\$198.8	\$199.8	\$200.0

Source: Compiled by CRS from House Appropriations Committee, Senate Appropriations Committee, and conference committees' authorizations through FY2002. Request figures are from FEMA budget justifications through FY2002. Congressional funding was found in annual VA, HUD, and Independent Appropriations through FY2004. Amounts requested for FMMI for FY2004 through FY2006 are taken from the DHS-EPRD budget justification. After FY2003, congressional funding for FMMI is found in annual DHS appropriations.

Abbreviations: T=type; n/e=non-emergency funds; e=emergency spending authority.

Notes: The \$5 million listed under FY2000 is a one-time appropriation to establish the FMMF. Final amounts may reflect appropriation rescissions, except for FY2006, pending approval of OMB of a 1% rescission on all federal discretionary spending.

Table 3, above, shows (1) the President's request for the FMMF/FMMI; (2) Congress's spending authority for emergency and non-emergency flood map production and updates passed through to the FMMI for FY2000; (3) other congressional spending authority for the FMMF from FY2001 through 2002; and (4)

⁷⁴ See "Federal Emergency Management Agency, Fee Schedule for Processing Requests for Map Changes, for Flood Insurance Study Backup Data, and for National Flood Insurance Map and Insurance Products," *Federal Register*, Aug. 1, 2002: 49922-49925.

⁷⁵ Non-emergency federal grants are provided through some state institutions to cities, towns, villages, and Metropolitan Sewerage Districts that want to become NFIP participants and are in imminent danger from flooding. Grants are used for conducting Flood Hazard Studies (FHS) and developing preliminary flood insurance rate maps.

congressional appropriations for FMMI which began in FY2003. The time line which follows briefly summarizes early presidential requests for FMMI and for spending authority through FY2002. This is followed by a brief summary of presidential requests and appropriations for FMMI from FY2003 through FY2006.

FY2000. In his FY2000 budget, former President Clinton requested \$5 million and congressional approval to establish a “Flood Map Modernization Fund” to support a “National Flood Map Modernization Program,” which initially would pay for developing digital flood maps (DFIRMs) after presidentially declared flood disasters. (See **Table 3.**) As the means for conducting a nonemergency flood hazard mapping program, former Director of FEMA, James Lee Witt, testified before Congress that “Increased budget authority [of \$58 million] could be offset with a \$15 Flood Policy Fee imposed on all federally regulated mortgages issued during FY2000.”⁷⁶

On August 3, 1999, The House Appropriations Committee reported out H.R. 2684, the VA, HUD, and Independent Agencies Appropriations Act of 2000 (H.Rept. 106-286) which recommended establishing a flood map modernization program with an appropriation of \$5,000,000, but noted that “on-going operation of the fund will require additional funding,” and that “FEMA is encouraged to propose mechanisms other than the fee on federally regulated mortgages in order to fully finance this program.”⁷⁷ Also, the House authorized FEMA to accept financial contributions or services on behalf of the program from states and local FMMI partners.

The Senate Appropriations Committee reported out S. 1596 (S.Rept. 106-161, September 16, 1999), its version of the FY2000 VA, HUD, and Independent Agencies funding bill. In that report, the committee expressed concern about President Clinton’s flood map modernization goal because “it would commit Congress to spend \$900 million over the life of the program,” from FY2000 through FY2007. As a consequence, the Senate deferred further action on the appropriation request of \$5 million to establish the FMMF.

The conference committee on H.R. 2684 disapproved the President’s request for use of the annual Flood Policy Fee (FPF) leveed on all new mortgages to fund the flood map modernization program (H.Rept. 106-379, October 20, 1999). In lieu, it would transfer \$15 million from FEMA’s Disaster Relief Fund (DRF) for emergency “flood map modernization activities in areas impacted by presidentially declared disasters.”⁷⁸ Congress passed H.R. 2684, authorizing a \$5 million appropriation for

⁷⁶ U.S. Congress, House Appropriations Subcommittee on VA, HUD, and Independent Agencies Appropriations for 2000, “Testimony of former Director of FEMA, James Lee Witt,” hearings (Washington, D.C., Mar. 2, 1999). “Right now we spend \$59 million a year out of the flood insurance policy holder fees to try and maintain flood maps, to re map as much as we can, and particularly to do new maps that communities have asked for.”

⁷⁷ U.S. Congress, House, Committee on the Whole on the State of the Union, VA, HUD, and Independent Appropriations Bill, 2000, H.Rept. 106-286, Aug. 3, 1999, p. 76.

⁷⁸ American Meteorological Society, “FEMA Director Cautions Still Much Work to be Done to Reduce Hurricane Losses,” *AMS Newsletter*, May 2001. On Apr. 11, 2001, speaking (continued...)

FEMA to establish the FMMF for non-emergency flood map modernization activities. P.L. 106-74 was signed by the President on October 20, 1999. In total, Congress approved \$20 million in spending for all flood map activities for FY2000.

FY2001. President Bush requested total spending authority of \$134.4 million for FEMA to implement the FMMI in his FY2001 budget submission. At least \$30 million of that, he stated, would be for “immediate map revisions warranted after Presidential disaster declarations” to be derived from the DRF. The President stated further that the balance, or \$104.4 million in spending authority, would be “offset by a \$12 Map Determination Fee (MDF) for those who use flood maps professionally.”⁷⁹

In H.R. 5482, VA, HUD, and Independent Agencies Appropriations for 2001, the House Appropriations Committee recommended \$30 million be transferred to the FMMF from the DRF instead (H.Rept. 106-674, June 7, 2000). The committee reported that “the proposal to replenish the Fund [FMMF] through the establishment of a flood map license fee has not yet been enacted.” It added that “In recognition of the need to update flood maps, the Committee recommends using a portion of disaster relief funding for this purpose, with the expected result being the long term reduction in losses caused by structures being placed in flood-prone areas.” This would be the first time Congress authorized use of the DRF for “non-emergency” flood map-related applications.

The Senate Appropriations Committee had reported out S. 4635 (amended), its alternative to H.R. 5482 (S.Rept. 106-10, September 13, 2000). The committee had recommended extending spending authority of \$5 million from the DRF for FY2001.

Conferees on H.R. 4635 (amended), the Omnibus Consolidated and Emergency Supplemental Appropriations Act for FY2001, agreed instead that “up to \$15 million be obligated for flood map modernization activities following disaster declarations” from the DRF (H.Rept. 106-988, October 18, 2000).⁸⁰ In total, Congress approved \$32.7 million in spending authority for FMMI for FY2001. It reported that the balance of spending authority (\$17.7 million) would be “offset by the equivalent of unspent income from sales of FIRMs and fees for flood map services collected

⁷⁸ (...continued)

before the National Hurricane Conference in Washington, D.C., FEMA Director, Joe M. Albaugh stated that “FEMA has received authorization [from Congress] to spend up to \$15 million from the Disaster Relief Fund to modernize and update its flood maps nationwide.”

⁷⁹ The President noted that flood map income would fund matching grants for states’ and tribal governments, and be used to support of local digital flood mapping activities.

⁸⁰ Since 1997, limited spending authority has been approved for the “Flood Hazard Mapping Program,” and is derived from a \$30 “Flood Policy Fee” (FPF) charged on each flood insurance policy. Congress also authorized use of \$46 million in fees for emergency flood mapping. In its first year, the FPF accounted for about 95% of all fees collected by the agency for flood mapping services. Of the remaining 5%, fees were collected for (1) individual requests for FEMA to overturn a flood hazard determination affecting their property on a FIRM and (2) from purchases of flood maps.

between 1994 and 1998" and was to be used in FY2001.⁸¹ H.R. 4635 (amended) was signed into law as P.L. 106-377 on October 27, 2000.

FY2002. When he submitted his FY2002 budget, President Bush requested spending authority for FEMA of \$7 million for emergency flood mapping activities. Also, for the first time appropriations were requested for the FMMI, President Bush requested \$25 million to be used for non-emergency map modernization activities.

The House Appropriations Committee reported out H.R. 2620, the VA, HUD, and Independent Appropriations Act of 2002 (H.Rept. 107-159, July 17, 2001) and authorized \$15 million in spending for the FMMF to be transferred from the DRF for emergency flood map activities. The committee stated that "While the atrocious state of the FEMA flood map data base is well-known, there has been little success in dealing with the problem over the last three years." It continued, "Proposals to create a funding mechanism to finance the process of updating flood maps have been met with criticism from affected parties or lack of action by the appropriate ... committees of jurisdiction." In response, the committee recommended an appropriation of \$50 million as a "down payment on a \$700 million process to update flood maps."

The Senate Appropriations Committee reported out S. 1216, its version of the VA, HUD and Independent Agencies funding bill for FY2002 (S.Rept. 107-43, July 20, 2001), which stated that "a viable program can be put in place to address the serious need for flood map modernization." The committee's recommendation included authority to transfer \$15,000,000 from the DRF to the FMMF for flood emergencies and use of up to an additional \$7,000,000 from prior year flood insurance policy fees for flood map modernization activities. The committee urged FEMA "to consult with other Federal and State entities and authorizing committees so that a viable program can be put in place to address the serious need for flood map modernization."

The conference committee on H.R. 2620 did not recommend appropriations for the FMMI as requested by the President and proposed by the House and Senate. Instead, it authorized \$25 million for emergency flood mapping activities to be transferred to the FMMF from the DRF (H.Rept. 107-272, November 8, 2001). Conferees also authorized FEMA to spend \$7 million in fees collected during fiscal years FY2000 and FY2001 for use of the FMMI in FY2002. In total, Congress authorized \$32 million in spending for flood mapping activities for FY2002. This was \$700,000 less than that authorized for FY2001, but the amount requested by President Bush who signed H.R. 2620 into law on November 26, 2001 (P.L. 107-73).

⁸¹ U.S. Congress, Senate Subcommittee on VA HUD, and Independent Appropriations, FY2001, hearing, May 16, 2000, "Testimony of Joe M. Allbaugh, Director of FEMA." Allbaugh stated that President Bush requested Congress to authorize FEMA to spend a \$30 fee per mortgage transaction imposed on all new properties requiring federal flood insurance coverage. The Administration estimated \$58.5 million in revenue for FMMI would have been generated; however, that spending authority was not approved in FY2001.

FMMI Budget Requests and Appropriations: FY2003-FY2006

In his FY2003 budget submission, President Bush requested “\$300 million for a five-year investment in FMMI” as part of a federal government-wide initiative to “implement cost-effective disaster prevention strategies.”⁸² The President’s budget projected that fees collected for flood map services over the next five years could offset about half of the estimated incremental costs of FMMI. (See **Table 1.**) Acting upon the Administration’s request, Congress *appropriated* funding for non-emergency activities of the FMMI for the first time since FY2000, although at half the amount requested for FY2003.

President’s Request. In justification of his request for \$300 million for FMMI, the President’s FY2003 budget stated that “Focusing flood reduction efforts on identifying the areas at risk for flooding and steering development away from those areas can be a less-costly, long-term approach to [flood] mitigation.” He added that “Modernizing flood maps would be critical to that effort.” The budget reflected the Bush Administration’s view point about the quality of FEMA flood maps, stating that many were “out of date and inaccurate.” Accompanying statistics showed that (1) 63% of those maps were 10 years old, (2) 33% were 15 years or older, and (3) an estimated 2,700 communities prone to severe flooding were not mapped at all.⁸³ The President also announced that availability of DFIRMs on FEMA’s website over the Internet would be expedited. That action, he stated, could help generate revenue for additional spending authority to offset some costs of FMMI (e.g., fees for commercial uses of DFIRMS, sales of professional licenses, public downloads of DFIRMs, sales of hard copies of DFIRMs, and provision of other web-based flood map services).⁸⁴

Congressional Appropriations Actions. The House Appropriation Committee estimated that if Congress were to approve the President’s request for FMMI and appropriate \$300 million for fiscal years 2003 through 2007, it would result in an 11-fold annual increase in budget authority for the program, compared with all flood mapping activities in FY2002. Some Appropriation committee staff were concerned about whether the President’s \$300 million request could be obligated effectively by FEMA. Also, congressional budget managers concerned about results-based budgeting as a tool for prioritizing appropriations were concerned whether the proposed annual funding levels for FMMI could be sustained over the life of the initiative. At issue were mandatory reporting of performance measures and program outcomes for FMMI required by the 1993 Government Performance and Results Act (GPRA). Budget officials suggested that other than tallying the number

⁸² Ibid. The President also requested \$50 million in spending authority from Stafford Act disaster relief funds for map modernization projects after declared flooding disasters.

⁸³ *Fiscal Year 2003, Budget of the U.S. Government*, p. 316 (Washington, D.C.: GPO, 2002).

⁸⁴ For a floodmap services fee schedule, see [http://www.fema.gov/fhm/frm_fees.shtm].

of new DFIRM produced or updated annually, FMMI performance and effectiveness could not be measured or ascertained until after a flood disaster occurred.⁸⁵

Nonetheless, Congress chose to appropriate funding to FEMA in FY2003 for FMMI for the first time. FEMA officials and flood mapping partners, including flood plain management professionals, mapping and cartography professionals, local governments, insurance industries, and loan guarantors considered dedicated federal funding for non-emergency flood map activities, accompanied by spending authority for emergency supplemental spending authority after a Presidentially declared flood disasters, a positive turning point and impetus for forging ahead with FMMI.

FY2003. The House Appropriations Committee reported H.R. 5605, and recommended \$300 million for FMMI for FY2003, the same as was requested by the President (H.Rept. 107-740, October 9, 2002). The report noted that the committee would have recommended a \$150 million appropriation for FMMI in FY2002; however, at that time, “the conference committee [on H.R. 2629] was not able to endorse the House position because of lack of funding.” H.Rept. 107-740 also noted that “modernization of flood maps should not sacrifice quality for quantity and program performance goals should not emphasize short-term quantity over product quality.” It added that

- Community engagement improves the quality of the new maps and heightens local risk awareness;
- Voluntary contributions, either monetary or in-kind is expected so that the investment of federal dollars is leveraged; and
- Cost shares will vary on a case by case basis but a goal of 20% is to be sought.

It recommended further that no less than \$75,000,000 be obligated for ‘basin-wide’ flood hazard risk analyses to support of the President’s proposal for a new direction for flood mapping. In addition, up to \$45,000,000 of FEMA’s budget would be earmarked for working partnerships with State, tribal and local government authorities and the private sector through Cooperating Technical Partnership (CTP) agreements. In that way, FEMA said that it could use local flood hazard-related knowledge and capabilities as well as private capital for DFIRM development.

Although the House is usually the legislative body to make discretionary funding recommendations for federal programs first, on July 25, 2002 the Senate Appropriations Committee reported out S. 2797 (S.Rept. 107-222), its version of VA, HUD, and Independent Agency Appropriations for 2003. It recommended \$300 million for the FMMI, stating that S. 2797 “will allow FEMA to move forward in meeting ... flood plain mapping needs.” After voting on the measure, the full Senate

⁸⁵ FEMA and all federal agencies are required to comply with the Administration’s and Congress’ annual results-based management requirements established by the 1993 GPRA. See, U.S. General Accounting Office, *Flood Insurance: Emerging Opportunity to Better Measure Certain Results of the National Flood Insurance Program*, “Statement of JayEtta Hecker, Director, Physical Infrastructure Issues before the Senate Subcommittee on VA, HUD, and Independent Agencies,” GAO-01-736T, May 16, 2001 (Washington, DC: 2001).

had approved \$200 million for FMMI, \$100 million less than the President's request and the House appropriation.

On February 13, 2003, conferees on H.J.Res. 2, the Consolidated Appropriations Act of 2003, reported out H.Rept. 108-10. The act would fund FEMA and, therefore, FMMI for the last time under VA, HUD, and Independent Appropriations. Congress appropriated \$150,000,000 (\$149.3 million after rescission) for the FMMF in support of FMMI. With respect to defining eligibility for funding, conferees reported that "for the sake of federal assistance, certain state programs in the process of developing statewide Geographic Information System [GIS] clearinghouses, and responsible for collecting and distributing GIS data to various federal, state and local users ... are consistent with the goals of FEMA's Flood Map Modernization Program." On February 20, 2003, the President signed H.J.Res. 2 into law as P.L. 108-7.

FY2004. On February 6, 2003, President Bush requested \$200 million for the FMMI for FY2004 in VA, HUD and Independent Agency Appropriations. However, on March 3, 2003, FEMA was transferred to the Department of Homeland Security (DHS) established on January 24, 2003, by Congress in response to the September 11, 2001 terrorist attacks on New York City and Washington, DC.⁸⁶

When Congress convened in January 2003, it established House and Senate appropriations subcommittees for DHS, which eventually assumed jurisdiction over FEMA and FMMI funding from VA, HUD, and Independent Agencies appropriations subcommittees. The President's request for FMMI for FY2004 under DHS appropriations did not change. In the FY2004 budget justification for the Emergency Preparedness and Response Directorate (EPRD) of DHS, which currently manages FEMA, the President requested that FEMA undertake a nationwide program of local topographical and basin-wide flood maps and continue its coastal flood mapping programs. President Bush stated that "These new types of flood maps would provide ... the means to assess flood hazard risks from different geographic perspectives."⁸⁷ Also, he indicated that the federal government would seek a 20% cost-share for flood modernization projects through CTP programs.

The House passed H.R. 2861, VA, HUD and Independent Appropriations for FY2004 on June 24, 2003 and appropriated \$200 million for the FMMI. The House report (H.Rept. 108-169) noted the value of state and local contributions as an effective means to leverage the cost of FMMI for the federal government and encouraged EPRD to continue the practice. It also recommended that FEMA provide financial assistance to communities imminently in need of flood map revision, and to fund FHSs and DFIRMs production for "at risk" communities.

⁸⁶ For background on the Homeland Security Act of 2002, P.L. 107-296 (116 Stat. 2135 et seq.), see CRS Report RL32242, *Emergency Management Funding for the Department of Homeland Security: Information and Issues for FY2005*, by Keith Bea, Shawn Reese, Wayne Morrissey, Frank Gottron, and C. Stephen Redhead.

⁸⁷ *U.S. Budget of the United States*, Fiscal Year, 2004, U.S. Office of Management and Budget (Washington, D.C.: GPO, 2003).

The Senate Appropriations Committee reported out S. 1584 (S.Rept. 108-86) on July 10, 2003, its version of the FY2004 spending bill recommended \$200 million for FMFI. The committee directed further that FEMA “continue the practice of providing funds to communities, states and regions with a demonstrated commitment to digitizing and improving the accuracy of area flood maps.” FEMA’s goal to compile up-to-date flood maps for the Nation within five years was also recognized by the committee which recommended funding levels requested by the President to support that goal. It noted that this account would (1) support the functions necessary to modernize and digitize flood maps used to determine appropriate risk-based premium rates for NFIP; (2) complete flood hazard determinations required of the Nation’s lending institutions; and (3) assist in developing appropriate disaster response plans for Federal, State, and local emergency management personnel. Although the Senate passed H.R. 2861 by unanimous consent, the measure was not acted upon further by Congress.

Instead, on September 24, 2003, Congress passed H.R. 2555, Department of Homeland Security Appropriations, 2004, which provided \$200 million for the FMMF. Henceforth, DHS appropriations would be the account from which all FMFI-related activities would be funded, emergency or otherwise (H.Rept. 108-280, September 23, 2003, p. 50). Conferees on H.R. 2555 authorized FEMA to use “such additional sums as may be provided by State and local governments or other political subdivisions for cost-shared mapping activities.” On October 1, 2003, the President signed H.R. 2555 into law as P.L. 108-90.

FY2005. President Bush requested \$200 million for FMFI in his FY2005 budget submission. He stated that an interim goal would be to provide \$40 million in grants through state and local government partnerships as an incentive to “provide digital GIS flood hazard data to 20 percent of the U.S. population via the internet.”⁸⁸

The House Appropriations Committee recommended \$150 million for FMMF in H.R. 4567 (H.Rept. 108-541, June 9, 2004). This amount was \$50 million less than the President’s request for FY2005 and \$48.8 million less than amounts for FMMF appropriated in FY2004 (after a 0.38% rescission). The committee recommended budget reductions based on “excessive unobligated balances” and directed EPRD to pursue funding for ongoing flood mapping projects at levels provided for in P.L. 108-7.⁸⁹ Report language was included limiting administrative costs of FMFI to three percent of total funding for it for FY2005. The committee added that appropriations approved for FY2005 remain available until expended.

The Senate Appropriations Committee reported S. 2537 (S.Rept. 108-280, June 17, 2004), its version of DHS funding for FY2005, and recommended \$200 million for FMFI, the same amount as requested by the President. The committee’s report encouraged FEMA “to continue its practice of providing funds to communities, States and regions with a demonstrated commitment to digitizing and improving the

⁸⁸ U.S. Department of Homeland Security, *Budget in Brief: Fiscal Year 2005*, pp. 37-39.

⁸⁹ U.S. Congress, House, *Making Further Continuing Appropriations for the Fiscal Year 2003, and for Other Purposes*, conference report to accompany H.J.Res. 2 H.Rept. 108-10, Feb. 13, 2003 (Washington: GPO, 2003).

accuracy of area flood maps.” It also urged the EPRD to “consider using available high resolution elevation models to develop flood hazard data to support flood map modernization for counties that have experienced flooding disasters.” The committee noted that “flood map modernization funds should be provided through the most efficient approach to updating the Nation’s flood maps, and that projects identified as “high risk” by States ... be funded, when possible, without adversely impacting the overall goal of completing the flood map modernization project within five years.”

Congress passed H.R. 4567 (amended) and appropriated \$200 million for FMMI, the funding level requested by the President for FY2005 (H.Rept. 108-774, October 9, 2004). It was signed into law as P.L. 108-334 on October 18, 2004.

FY2006 Request and Appropriations. For FY2006, President Bush requested \$200.7 million for the FMMI. (See **Table 1.**) The *Analytical Perspectives* volume of the President’s FY2006 budget submission stated that “The NFIP ... operates a flood hazard mapping program to quantify the geographic risk of flooding” and that, with respect to flood map modernization, “These efforts have made substantial progress.”⁹⁰

With passage of H.R. 2360, the House had appropriated \$200 million for FMMI, or \$0.68 million less than the President’s request. The House Appropriations Committee report (H.Rept. 109-79, May 13, 2005) stated that “the Committee understands that this five-year, \$1,000,000,000 program will not update all flood maps; some maps will merely be converted to a digital format.” It noted further that it is “concerned that this program was originally portrayed as a means to update all of the Nation’s flood maps.” At issue was new data and information presented in FEMA’s Multi-Year Flood Hazard Identification Plan FY04-FY08, Version 1.0, November 2004 (MHIP) that focused on scheduling of future DFIRM revisions (updates). The House directed that DHS provide a report no later than January 16, 2006 disclosing the percentage of maps that will actually be updated by the original target date (the end of 2007). It also directed FEMA to exclude FIRMS that had been converted to digital format only. Finally, the committee directed DHS to provide the percentage of total U.S. population that the updated maps would cover with federal flood insurance within that period. The House also addressed FEMA authority pertaining to (1) collection of sums from nonfederal cost-shared mapping activities; (2) limitation of total administrative costs (up to three percent of the FMMF appropriation); and (3) time limitations on the appropriation.

The Senate Appropriations Committee had also recommended funding of \$200 million for FMMI in S. 2537, its version of Homeland Security Appropriations for FY2004 (S.Rept. 109-83, June 17, 2005). On September 14, 2005, the full Senate recommended that H.R. 2360 pass as reported by the House.

Conferees on H.R. 2360 approved \$200 million for FMMI for FY2006 (H.Rept. 109-241, October 9, 2005), the same amount appropriated by the House and recommended by the Senate. The conference report encouraged FEMA to “prioritize

⁹⁰ *Budget of the United States Government, Fiscal Year 2006, Analytical Perspectives*, p. 104, at [<http://www.whitehouse.gov/omb/budget/fy2006/pdf/spec.pdf>].

as criteria the number of stream and coastal miles within the state, the Mississippi Delta Region [as a ranking factor for funding distribution], and participation of the state in leveraging non federal contributions.” In addition, conferees directed FEMA to “prioritize funding for the program to support those states that integrate the [flood map modernization] Program with other state programs to enhance greater security efforts and capabilities in the area of emergency management, transportation, and planning and disaster response.” Further they recognized the importance of updated flood maps in state planning as an efficient use of federal dollars (S.Rept. 109-241, pp. 74-75)