National Flood Insurance Program: Background, Challenges, and Financial Status

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Summary

In 1968, the U.S. Congress established the National Flood Insurance Program (NFIP) to address the nation's flood exposure and challenges inherent in financing and managing flood risks in the private sector. Private insurance companies at the time claimed that the flood peril was uninsurable and, therefore, could not be underwritten in the private insurance market. A three-prong floodplain management and insurance program was created to (1) identify areas across the nation most at risk of flooding; (2) minimize the economic impact of flooding events through floodplain management ordinances; and (3) provide flood insurance to individuals and businesses. Major changes were made to the program in 1973, 1994, and 2004.

Until 1986, the NFIP was funded, in part, by appropriations. The NFIP was self-supporting from 1986 until 2005 as policy premiums and fees covered all expenses and claim payments. In 2005, the NFIP incurred approximately $17 billion in flood claims caused by Hurricanes Katrina, Rita, and Wilma. This amount exceeded the $2.2 billion in annual premiums and the $1.5 billion in borrowing authority from the U.S. Treasury. As a result, Congress passed and the President signed into law legislation to increase NFIP borrowing authority first to $3.5 billion (P.L. 109-65) and then to $18.5 billion (P.L. 109-106) in November 2005, and finally to $20.775 billion (P.L. 109-208) on March 23, 2006. As of January 31, 2011, the outstanding debt and accrued interest cost stood at $17.775 billion. Under current law, the funds borrowed from the U.S. Treasury must be repaid with interest. The program, however, is not in a position to repay the debt.

The 111th Congress enacted legislation to ensure that basic NFIP authorities remain in force while the debate continued on reform proposals. Legislation to reform and reauthorize the NFIP failed to pass the Senate in 2010, leaving the program with a temporary extension that will expire on September 30, 2011. Although the Federal Emergency Management Agency (FEMA) is now able to issue new policies, renew policies, increase coverage amounts, and pay claims, concerns remain that this latest extension, and the possibility of yet another lapse in authority after September 30, 2011, could result in uncertainty among lenders, borrowers, and policyholders.

In the 112th Congress, one unintended consequence of efforts to reform the NFIP involves FEMA's ongoing update of its flood hazard risk assessment processes—FEMA's Map Modernization (Map Mod) program—and its public awareness and education initiatives. As newly revised Flood Insurance Rate Maps (FIRMs) become effective in NFIP-participating communities across the country, many property owners not previously required to be covered under a flood insurance policy are learning about new flood risk data currently being produced and disseminated by FEMA. FEMA is informing homeowners that their properties have been remapped into a special flood hazard area (SFHA) and, therefore, they are subject to the NFIP's mandatory flood insurance purchase requirement.

On January 25, 2011, Representative Candice S. Miller introduced H.R. 435, the National Flood Insurance Program Termination Act of 2010, to terminate the NFIP and related mandatory purchase and compliance requirements. The bill would authorize interstate compacts to allow states to enter into agreements or compacts to make available to interested persons flood insurance coverage.

This report will be updated as events warrant.

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In 1968, Congress created the National Flood Insurance Program (NFIP) to address the increasing costs of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods.[1] Since its inception, the NFIP has earned sufficient premium in almost every year to pay flood losses incurred by policyholders, and borrowed from the U.S. Treasury in catastrophic loss years to meet revenue shortfalls. Because of extraordinary losses incurred following the hurricanes in 2005, however, the program carries a debt of $17.775 billion as of January 31, 2011. As it currently stands, there is a widespread consensus that the NFIP faces serious financial, structural, and managerial challenges and requires significant reforms to continue providing flood protection to homeowners and businesses.

This report provides an analysis of the NFIP and its financial status; summarizes the major challenges facing the program, including issues affecting its long-term financial solvency; presents some alternative approaches for managing and financing the flood losses; and describes pending legislation on this issue.

Recent Developments

Legislation to reform and reauthorize the NFIP failed to pass the Senate in 2010, leaving the program with a temporary extension that will expire on September 30, 2011. Although the Federal Emergency Management Agency (FEMA) is now able to issue new policies, renew policies, increase coverage amounts, and pay claims, concerns remain that this latest extension, and the possibility of yet another lapse in authority after September 30, 2011, could result in uncertainty among lenders, borrowers, and policyholders.

The current authorization status of the NFIP should be viewed within the larger context of efforts in Congress to reform and modernize the NFIP. Since the devastation caused by Hurricanes Katrina, Rita, and Wilma in 2005 and Ike in 2008, Congress has sought to reform and strengthen the long-term viability of the NFIP with reforms that included efforts to increase participation in the program, remapping the floodplains to encourage communities and citizens to understand their risks from flooding and mitigate against future flood damage, and setting premiums for repetitively damaged structures according to their "full risk" premium.

A lapse in NFIP authority after September 30, 2011, might be of concern to policymakers for several reasons. First, access to a stable supply of flood insurance affects the recovery of the U.S. housing market, rebuilding the Gulf Coast region after the 2005 hurricane season, to ensure the overall safety and soundness of the banking industry's loan portfolios. Second, access to flood insurance remains critical to the government's mandatory flood insurance purchase requirement given that homebuyers need to purchase flood insurance as a condition for obtaining mortgage financing from federally regulated lenders on loans that are or will be secured by property located in Special Flood Hazard Areas (SFHA). Third, federal flood insurance ensures that appropriate claims are paid for the more than 5.6 million existing NFIP policyholders who depend on the NFIP as their main source of financial protection against flooding.

On June 15, 2010, the House passed H.R. 5114, the Flood Insurance Reform Priorities Act of 2010, to reauthorize the NFIP through FY2015 and to make certain reforms to the program. These reforms include (1) a phase-in of actuarial rates for non-residential properties and non-primary

[1] FEMA administers the NFIP established by 42 USC § 4001 et seq.

residences; (2) a delay in the effective date for the mandatory purchase of flood insurance for certain areas not previously designated as having a special flood hazard; (3) a five-year phase-in of flood insurance rates for newly mapped areas not previously designated as having special flood hazard; (4) an increase in the annual limitation on premium increases; (5) the establishment of the Office of Flood Insurance Advocate; and (6) the commission of several studies on expanding mandatory flood insurance purchase requirements for low-income families and building codes. The Senate did not take up H.R. 5114.

The 111th Congress ended without a reform bill being enacted into law. The key regulatory reform issues debated in the 111th Congress that may carry over into the 112th Congress include

- long-term financial solvency of the National Flood Insurance Fund, which may include requiring the NFIP to create a reserve fund; forgiveness of the U.S. Treasury debt incurred during Hurricanes Katrina, Rita, and Wilma in 2005; and phase-in of actuarial rates for non-residential, non-primary residences, and repetitive loss properties;
- a program to review, update, and maintain flood insurance program maps and elevation standards that include mapping of the 500-year floodplains and areas behind levees;
- the requirement of FEMA to participate in state-sponsored mediation programs; and
- an additional provision for multiple-peril (windstorm) insurance in the standard NFIP policy.

In the 112th Congress, one unintended consequence of efforts to reform the NFIP involves FEMA's ongoing update of its flood hazard risk assessment processes—FEMA's Map Modernization (Map Mod) program—and its public awareness and education initiatives. As newly revised Flood Insurance Rate Maps (FIRMs) become effective in NFIP-participating communities across the country, many property owners not previously required to be covered under a flood insurance policy are learning about new flood risk data currently being produced and disseminated by FEMA. FEMA is informing homeowners that their properties have been remapped into a special flood hazard area (SFHA) and, therefore, they are subject to the NFIP's mandatory flood insurance purchase requirement.

Background

Historically, floods have been among the most costly natural disasters in the United States. Flooding along river banks has been a main public policy concern for years. An additional challenge today is flooding caused by weather-related coastal hazards—hurricanes, storm surges, and tornadoes—that are increasing in frequency and severity, creating an unprecedented threat to U.S. coastlines and Midwestern states where floods that would historically occur once every 20 years are projected to happen every four to six years.[2] This situation has become a concern of

[2] National Science and Technology Council, Climate Change Science Program and the Subcommittee on Global Change Research, *Weather and Climate Extremes in a Changing Climate - Regions of Focus: North America, Hawaii, Caribbean, and U.S. Pacific Islands*, June 2008, at http://www.climatescience.gov/Library/sap/sap3-3/final-report/sap3-3-final-all.pdf.

policymakers because more than half of the U.S. population now lives in coastal watershed counties or floodplain areas and approximately 50% of the nation's gross domestic product ($4.5 trillion in 2000) is generated in those Gulf and Atlantic coastal areas.[3] One estimate from Lloyds of London and Risk Management Solutions (RMS) predicts that flood losses along the Gulf and Atlantic coastlines would increase 80% by 2030 with a one foot rise in the sea level.[4] The corresponding surge in economic losses from coastal hazards arguably demands a national policy response to better manage the costs of existing coastal risks.

Table 1 provides a list of the top fifteen flood events in the United States in terms of NFIP payouts. The devastation from Hurricane Katrina emerged as a pivotal event in the history of federal flood control policy, with wind and flooding estimated to have caused over $200 billion in economic damages (both insured and uninsured) and more than 800 deaths.[5] The 2005 hurricanes strengthened arguments that there may be a trend increase in the cost of floods and the frequency of major flood disasters.

The U.S. governments has at times regulated private economic activity for the purpose of promoting economic recovery and protecting or supporting particular economic groups. For example, economic uncertainty stemming from widespread flooding in the mid-1960s, the need for economic relief and recovery for flood victims, and calls for a reduction in the financial burden on taxpayers led to economic regulation of the nation's floodplains and insurance markets. The government became a regulator of certain economic activity in flood-prone areas to reduce the physical and economic risks associated with flood hazards. In the absence of a sufficient supply of insurance to meet societal demand, the government took action to safeguard the economic interests of consumers, businesses, communities, and taxpayers.

Economic regulation was accomplished in two ways. First, the government acted to limit the discretion of individuals and companies engaged in economic activity in flood prone areas. Depending on whether a building is located in a government-designated SFHA, flood insurance may be required as a condition of obtaining a federally secured mortgage loan. Homeowners typically discover they need flood insurance during the home-buying process that includes a disclosure of where the property is located relative to the SFHA that is mapped on a FIRM.

Second, economic regulation was accomplished through "managerial regulation," with the government providing subsidized flood insurance for individuals and businesses in communities that undertook specific steps to regulate the floodplain through land use zoning ordinances and building standards.[6]

[3] U.S. Commission on Ocean Policy, *An Ocean Blueprint for the 21St Century*, September 2004, at http://oceancommission.gov/documents/full_color_rpt/000_ocean_full_report.pdf.

[4] Lloyds of London and Risk Management Solutions, *Coastal Communities and Climate Change: Maintaining Insurability*, 2008, at http://www.lloyds.com/NR/rdonlyres/38782611-5ED3-4FDC-85A4-5DEAA88A2DA0/0/FINAL360climatechangereport.pdf.

[5] 24/7QuoteUS.com, *67 Worst Natural Disaster: The Last 103 Years*, April 27, 2009, located at http://www.247quoteus.com/general/67-worst-natural-disasters.

[6] James Anderson, "Economic Regulation," *Encyclopedia of Policy Studies*, Stuart S. Nagel, ed. (New York; Dekker Publishers), 1994, p. 404.

Table 1. Top Fifteen Significant Flood Events Covered by the National Flood Insurance Program

(1978 – December 31, 2010; $ nominal)

Rank	Event	Date	Number of Paid Losses	Amount Paid	Average Paid Loss
1	Hurricane Katrina	Aug. 2005	167,216	$16,172,136,626	$96,714
2	Hurricane Ike	Sept. 2008	46,219	2,629,409,589	56,890
3	Hurricane Ivan	Sept. 2004	27,637	1,582,348,735	57,255
4	Tropical Storm Allison	June 2001	30,6632	1,103,877,235	36,000
5	Louisiana Flood	May 1995	31,343	585,071,593	18,667
6	Hurricane Isabel	Sept. 2003	19,860	492,830,017	24,815
7	Hurricane Rita	Sept. 2005	9,504	470,413,959	49,496
8	Hurricane Floyd	Sept. 1999	20,438	462,268,248	22,618
9	Hurricane Opal	Oct. 1995	10,343	405,527,543	39,208
10	Hurricane Hugo	Sept. 1989	12,840	376,433,739	29,317
11	Hurricane Wilma	Oct. 2005	9,609	363,798,528	37,860
12	Nor'Easter	Dec. 1992	25,142	346,150,356	13,768
13	Midwest Flood	June 1993	10,472	272,819,515	26,052
14	PA, NJ, NY Floods	June 2006	6,410	227,475,398	35,488
15	Nor'Easter	Apr. 2007	8,639	225,623,333	26,117

Source: U.S. Department of Homeland Security, Federal Emergency Management Agency.

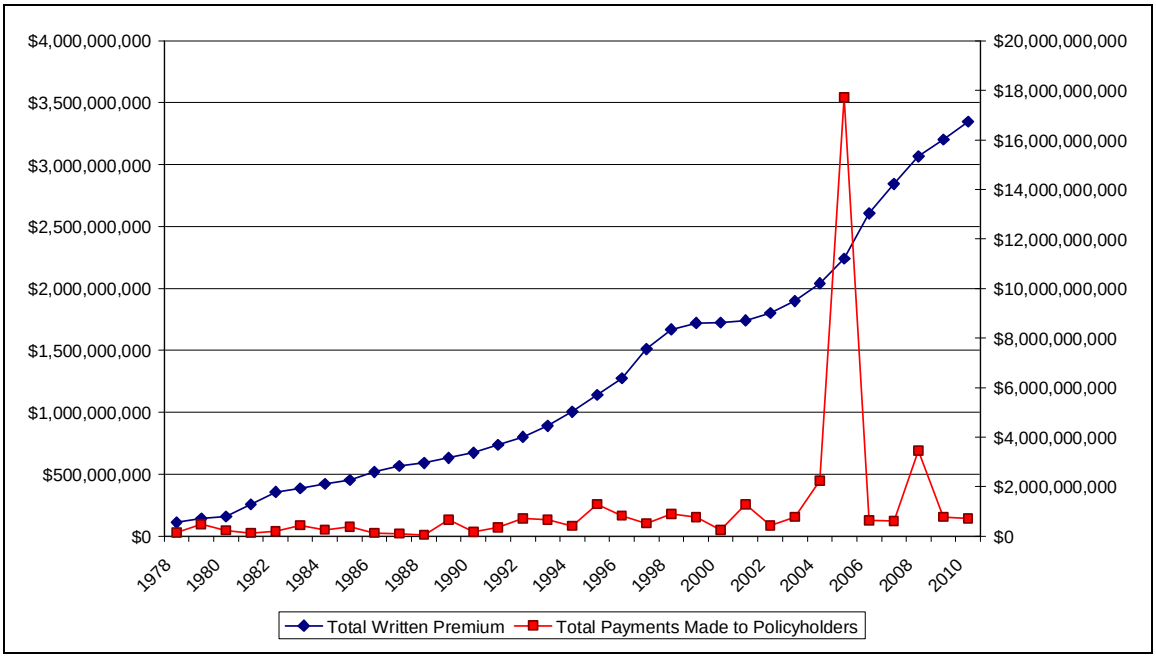
In the wake of Hurricanes Katrina, Rita, and Wilma in 2005, Hurricane Ike and the Midwest floods of 2008, and the New England region floods in 2010, Members of Congress may wish to examine the viability of the NFIP's structure, function, and financial solvency. Some also question whether the government should continue to underwrite insurance in support of coastal development and rebuilding in flood-prone areas. Meanwhile, federal expenditures for federal relief payments and insurance claims in coastal communities and along riverbanks continue to be a major challenge for the NFIP.

Exposure to Flood Hazard Risk

The United States is a geographically diverse nation that is exposed to hydro-meteorological (weather, climate and water-related) hazards that each year threaten human life, cause destruction of social and economic infrastructure, and degradation of fragile ecosystems. Floods historically constitute the most destructive hazard facing the nation. **Figure 1** shows flood loss payments and premium under the NFIP over the period from 1978 to 2010. The economic impact of floods has shown a marked upward trend over the past several decades, both in terms of unprecedented claims payments to insured victims. Post-disaster federal disaster relief to aid the uninsured population exposed to flood hazard risk has also risen sharply. Two-thirds of all presidential disaster declarations over the 1958-2010 period came as a result of floods, doubling from an average of 17 per year in the 1980s to 37 in the 2000s.

Figure 1. Total Premiums Written versus Total Payments Made to Policyholders Under the National Flood Insurance Program: 1978-2010

($ nominal)



Source: U.S. Department of Homeland Security, Federal Emergency Management Agency.

Economic Regulation and Recovery from Flood Hazards

Congress has a responsibility through the "general welfare" and "interstate commerce" clauses of the U.S. Constitution to promote national economic growth. One factor affecting the nation's economic well-being is the proper functioning of markets for natural disaster risk: do economic markets provide a sufficient amount of insurance against flood hazards? Further, to the extent that flood insurance exists, are the insuring firms sufficiently capitalized so that widespread insolvencies would not occur? These were just a few of the key questions the nation faced in the 1960s, as hurricanes caused increased havoc along the U.S. Gulf and Atlantic coasts.

There were four very broad underlying causes for economic regulation—government intervention—in the market for flood insurance in the 1960s. *First*, people insisted that social and ethical values as well as economic values should be reflected in the operation of the economy. Persons suffering economic distress or dislocation from flood hazards sought and received governmental aid in dealing with their problem. The aid was in the form of disaster relief assistance, subsidized flood insurance, and government spending on flood risk identification and mapping.

Second, government action was viewed as being necessary to bring about more efficient coordination and utilization of resources. Economic regulatory programs were thought to be needed to prescribe certain land use zoning ordinances and building code standards to govern

economic or business behavior to reduce the physical and economic risks associated with coastal hazards.

Third, as the nation experienced widespread flooding in the 1960s, people became interested in their personal security and, thus, in shifting some or all of the risk of economic life from themselves to government. In response, policymakers changed the way economic risk of flooding was defined and the means of achieving security for the individual. Economic hazards, whether man-made or natural, were initially considered inevitable or "acts of God" but came to be viewed as public problems that required government action to protect individuals, businesses, communities, and taxpayers. Government assistance in the form of subsidized insurance premiums was viewed as a solution to reduce the future costs and risks of investing in flood-prone areas.

Fourth, sole reliance on insurance markets for flood risks was not an option. This situation provided a rationale for possible government intervention in the economy to ensure that the costs and benefits of living in flood-prone areas were not ignored. Individuals and insurers at risk of flooding, however, have in the past lacked the information necessary for the market system to operate effectively. Insurers did not always have flood hazard maps, as they do now, and thus had no reliable, consistent, and cost-effective way to identify and assess flood risk. Homeowners did not and sometimes still do not, have the information needed to make rational economic decisions about real estate investments. All this resulted in a misallocation of resources which required and still requires government intervention to protect the public interest.

Evolution of the National Flood Insurance Program

Flood hazards in the United States, whether from hurricanes and the impact of storm surge on property or inland flooding on rivers, lakes and streams, was largely deemed commercially uninsurable. The standard multi-peril homeowners insurance did not provide coverage against flood hazards. Floods were perceived to be uninsurable for three reasons: (1) adverse selection meant that only individuals in flood-prone areas would purchase coverage; (2) risk-based premiums were too costly for the average household; and (3) insurers could not generate sufficient premiums to insure against a catastrophic flood event. Government mapping of areas prone to flooding, subsidized flood insurance, and floodplain management regulations were key to the program's structure and function. These concerns about flood insurance market failure led to the passage of the National Flood Insurance Act of 1968.

Traditional insurance principles indicated that private insurers would not be able to gather a large enough pool of independent risks to allow the actuarial technique of "law of large numbers" to reduce the risk. Most property owners in floodplains usually face the same flood hazard and their risks tend to be highly correlated—not independent. Correlated risks means the insurer must charge higher premiums to reflect a larger risk load or administrative cost that accounts for the uncertainty faced by the insurer in predicting future losses of the pool. In other words, the premium level that private insurers needed to adequately underwrite flood hazards would be so high that few would be willing to purchase coverage.

The NFIP was a public policy response to the flood peril and escalating costs of taxpayer-funded disaster relief for flood victims. Federally backed flood insurance was made available to home and business owners in communities that voluntarily agreed to adopt and enforce floodplain management ordinances designed to reduce flood-related property losses. The creation of the

NFIP marked a significant shift in U.S. flood control policy away from a "levee-only" flood reduction approach towards a risk identification, risk financing and floodplain management approach that was intended to foster individual responsibility and build local self-sufficiency in terms of land-use zoning ordinances and construction standards.

Federal flood insurance was considered to be an economically efficient way to indemnify flood victims and to have individuals internalize some of the risk of locating property in the floodplains.[7] The federal government would utilize its capacity to spread losses over time with the NFIP's ability to borrow money from the U.S. Treasury to offset program deficits. A federal government insurance program, it was thought, could also link the availability of flood insurance to land use regulation and building codes that would, in theory, reduce long-term flood risk.

Today, under the NFIP, the federal government is required to take certain actions to

- identify and map areas across the country that are at high risk of flooding;
- indemnify individuals and businesses against flood losses by making flood insurance widely available at actuarially sound rates or with legally mandated premium subsidies; and
- reduce future flood losses through floodplain management regulations and actions.[8]

The NFIP has undergone major changes largely in response to significant flood events over the years. For example, the program was created after Hurricane Betsy devastated the Gulf Coast in 1965. After Hurricane Agnes in 1972, recognizing the low market penetration of flood insurance, Congress enacted the Flood Disaster Protection Act of 1973[9] to establish a mandatory flood insurance purchase requirement for structures located in identified SFHA. After the 1973 Act, federally regulated lenders were obligated to require flood insurance on any loan secured by improved real estate in a FEMA-designated SFHA in a participating community.

After the 1993 Midwest floods, it became apparent to Congress that homeowners were still not adequately complying with the mandatory insurance purchase requirement. The Midwest flood of 1993 provided the impetus for strengthening lender compliance through the mandatory purchase provisions in the 1994 National Flood Insurance Reform Act.[10] Recognition of the impact of properties prone to repetitive flooding on the financial condition of the program led to the passage of the Flood Insurance Reform Act of 2004[11] which established a pilot program for the mitigation of severe repetitive loss properties (SRLPs) and the funding of mitigation activities for individual SRLPs.

Although the NFIP faces many challenges, and there is widespread agreement that the program needs to be reformed, the evidence continues to suggest broad support for the basic principle of

[7] Dan R. Anderson, The National Flood Insurance Program: Problem and Potential, *The Journal of Risk and Insurance*, 1974, vol.16 (4), p. 579-599.

[8] Flood damage reduction is thought to be achievable through extensive flood control structures, such as levees and dams and non-structural methods, including land use ordinances, buy-outs, and elevation of existing buildings and roads.

[9] P.L. 93-234, 87 Stat 975.

[10] P.L. 103-325, 108 Stat. 2255.

[11] P.L. 108-264, 118 Stat. 712.

using an insurance pooling mechanism for those who have chosen to live in high-risk areas. Some of the policy questions for the 112th Congress include the following: Is the NFIP currently encouraging unwise construction in floodplains? Are taxpayers subsidizing unwise construction as a result of inaccurate maps? If the program does encourage unwise construction or rebuilding in high-risk areas without proper first-floor elevation, what steps should policymakers take to keep the promises of safer construction made to taxpayers at the inception of the program? If premiums are inadequate to finance programs, is Treasury debt the only answer?

Lessons from Katrina and the 2008 Midwest Floods

The 2008 Atlantic hurricane season was among the costliest on record for flood losses and resulted in a large infusion of taxpayers' money to cover uninsured disaster losses. Hurricane Ike alone caused about $2.3 billion in NFIP claims along the coastal areas of Texas and Louisiana and further inland, including many areas not typically subject to tropical rain events. In addition to flooding from Hurricane Ike there was extensive 500-year flood damage in the Midwest that was not anticipated by current out-of-date methodologies. According to FEMA, more than 11 million people in nine Midwestern states were affected by the 2008 Midwest floods as major rivers in Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, and Wisconsin overflowed their banks and levees. Especially hard hit states were Iowa, Indiana, and Illinois, where the river levels surpassed levels reached in the Great Flood of 1993.

Although the 2008 Midwest floods caused dozens of levees to be breached, destroying thousands of homes and businesses, and inundating thousands of acres of agricultural cropland, the flooding did not rank among the NFIP's top 15 most costly events. Payments under the NFIP were relatively low because of low flood insurance purchases in the affected areas. Similarly, although the 1993 Midwest flood was the most devastating flooding in the region's history, it ranks 13th among the leading NFIP flood events with $273 million in NFIP claims.

In 2005, the devastating flooding caused by Hurricanes Katrina and Rita resulted in approximately $200 billion in economic losses, of which $21.9 billion was covered under the NFIP. The massive flood losses from Hurricanes Katrina and Rita financially overwhelmed the NFIP. It also focused public attention on (1) the economics of government risk-bearing through federal flood insurance when private insurers do not offer affordable coverage; (2) the exposure of the federal taxpayer to losses when program revenues do not cover costs; and (3) the effectiveness, arguably limited, of the nation's floodplain management strategy in reducing federal disaster relief expenditures.

Several lessons emerged from Hurricane Katrina and the 2008 Midwest floods that could help inform Members of the 112th Congress during policy deliberations on the reform and reauthorization of the NFIP.

- **Program Participation to Reduce Uninsured Losses**. Many homeowners do not completely recognize or internalize their flood risk and act overly optimistic about the magnitude of the flood risk to which they are exposed. Consequently, the NFIP has not achieved the level of individual participation originally envisioned by Congress. A study of the NFIP's mandatory purchase requirement nationwide conducted by the Rand Corporation indicated that only about 49% of

single family homes in SFHA are covered by flood insurance.[12] In the absence of flood insurance, the cost of repairing flood damaged property is usually borne either by the property owner from their own financial resources, or by federal relief payments instead of by flood insurance payments. This situation has resulted in billions of dollars of uninsured property losses and arguably results in higher social costs. The high degree of uninsured flood losses during the 2008 Midwest floods has raised the policy question of who should appropriately bear the cost of the decision to live in potentially high-risk areas, including areas behind flood control structures.

- **Inadequate Floodplain Management.** The altering of rivers and streams by construction of dams, levees, and other flood control structures arguably increased the risk of major floods and development throughout the affected floodplains. Policymakers learned that there are hidden costs to water resources and flood control structures and that steps must be taken to reduce the risk of future flood disasters. There is the recognition of the need to strengthen the NFIP community land-use and building standards to reduce floodplain development, improve public awareness of flood risk, and reduce cost to U.S. taxpayers. The U.S. Army Corps of Engineers has undertaken cost-benefit analysis of water resources projects. The findings of these studies could be used to better manage the NFIP's floodplain management standards.
- **Flood Risk Assessment and Mapping.** Nationwide actuarial rates and underwriting process may not reflect the actual flood risk in a given location. Property owners affected by Hurricane Katrina and the 2008 Midwest floods may have made location choices that did not consider all of the costs because of inaccurate or outdated flood hazard maps. The price charged for federal flood insurance could understate the risk; premiums may be too low or higher than the actual risk would dictate. Economists note that if property owners had to incur more of the cost of locating in flood-prone areas with the purchase of insurance, they would make more efficient location decisions. Moreover, the maps did not delineate areas of storm water and groundwater flooding or capture increases in localized storm water runoff flooding resulting from development, deforestation, and other land use changes.
- **Residual Risk Behind Levees.** Flood damage in 2008 was relatively high because of the over-reliance on levees and the false sense of security they provide. Homeowners may have thought that because they resided behind a certified levee, they were not subject to flood risk. There are significant potential economic risks of not pricing or establishing sufficient loss reserves to cover residual risks behind flood control structures. Based on the certification of levees as providing at least protection from the 1% annual chance flood, property owners may not be required to purchase flood insurance, yet they may face significant uninsured losses if the levee is overwhelmed. FEMA has consistently sought to communicate to the public the fact that certified levees do not eliminate the risk of flooding. The lack of understanding of the national flood risk, the inadequate communication of that risk, and diminished capabilities in flood risk

[12] Rand Institute for Civil Justice, "The National Flood Insurance Program's Market Penetration Rate: Estimates and Policy Implications," http://www.rand.org/pubs/technical_reports/2006/RAND_TR300.pdf.

management due to inaccurate or out-of-date flood hazard maps have been deemed major weaknesses in the program.

- **Inadequate Pricing of Flood Risks.** The most costly flood in the 41-year history of the NFIP was caused not by rainfall-river flooding but by breeched or overtopped levees that did not protect the City of New Orleans from coastal storm surges. According to FEMA, some 75%-80% of the area behind the levees protecting New Orleans was designated SFHA (high-risk zone) due to rainfall and there was an explicit flood insurance purchase requirement in effect in the affected areas. Still, the NFIP assumed the levees were going to hold back storm surge floods and the program did not adequately price the policies to reflect the possible failure or overtopping of levees.
- **Availability of Federal Disaster Assistance.** Flood victims may have thought, in retrospect correctly, that the purchase of flood insurance was not necessary to receive some compensation for flood related losses from the federal government. The availability of federally-subsidized flood insurance in high-risk areas arguably encouraged too many people to locate in flood-prone areas and to not take appropriate steps to mitigate loss, leaving these financial losses to be either uncompensated or transferred to third-parties, including taxpayers via federal disaster assistance. Economists maintain that the assurance of federal assistance in the event of a repeated disaster creates a "moral hazard" by lowering the incentives to avoid risk. In some ways, this situation arguably counteracts one of the original objectives of the NFIP, namely to minimize future flood damages and the corresponding need for federal disaster relief.

Financial Status

This section examines the current financial status of the program and borrowing from the U.S. Treasury.

Table 2 shows that the NFIP currently has more than 5.6 million policies-in-force nationwide covering approximately $1.2 trillion in property in almost 20,000 participating communities. Policyholders paid $3.35 billion in premiums in 2011. The NFIP experienced only one catastrophic loss year, in 2005, in its 42-year history, and the Midwest floods of 2008 severely tested the financial resiliency of the NFIP. In an attempt to both protect the NFIP's integrity after the 2005 hurricanes and ensure FEMA had the financial resources to cover its existing commitments, Congress passed, and the President signed into law, legislation to increase the NFIP's borrowing authority to allow the agency to continue to pay flood insurance claims: first to $3.5 billion on September 20, 2005; to $18.5 billion on November 21, 2005; and finally to $20.775 billion on March 23, 2006. FEMA had to borrow another $2.6 billion over the 2007 through 2009 period to pay claims from Hurricane Ike and the Midwest floods of 2008. The program's outstanding debt to the Treasury stands at $17.775 billion, as of January 31, 2011. FEMA is not likely to be able to repay the debt because of the considerable amount of interest associated with that level of borrowing. Interest payments on the program's debt to the Treasury is almost $1 billion annually.

Table 2. NFIP Program Statistics
(as of January 31, 2011; $ nominal)

Calendar Year	Number of Policies in Force	Total Written Premium	Total Face Value of Coverage	Total Number of Claims Paid	Total Payments Made to Policyholders
1972-1977	NA	NA	NA	4,441	$18,035,658
1978	1,446,354	$111,250,585	$50,500,956,000	29,122	$147,719,253
1979	1,843,441	$141,535,832	$74,375,240,000	70,613	$483,281,219
1980	2,103,851	$159,009,583	$99,259,942,000	41,918	$230,414,295
1981	1,915,065	$256,798,488	$102,059,859,000	23,261	$127,118,031
1982	1,900,544	$354,842,356	$107,296,802,000	32,831	$198,295,820
1983	1,981,122	$384,225,425	$117,834,255,000	51,584	$439,454,937
1984	1,926,388	$420,530,032	$124,421,281,000	27,688	$254,642,874
1985	2,016,785	$452,466,332	$139,948,260,000	38,676	$368,238,794
1986	2,119,039	$518,226,957	$155,717,168,000	13,789	$126,384,695
1987	2,115,183	$566,391,536	$165,053,402,000	13,400	$105,432,378
1988	2,149,153	$589,453,163	$175,764,175,000	7,758	$51,022,523
1989	2,292,947	$632,204,396	$265,218,590,000	36,245	$661,658,285
1990	2,477,861	$672,791,834	$213,588,265,000	14,766	$167,896,816
1991	2,532,713	$737,078,033	$223,098,548,000	28,549	$353,681,702
1992	2,623,406	$800,973,357	$236,844,980,000	44,650	$710,225,154
1993	2,828,558	$890,425,274	$267,870,761,000	36,044	$659,059,461
1994	3,040,198	$1,003,850,875	$295,935,328,000	21,583	$411,075,128
1995	3,476,829	$1,140,808,119	$349,137,768,000	62,441	$1,295,578,117
1996	3,693,076	$1,275,176,752	$400,681,650,000	52,677	$828,036,508
1997	4,102,416	$1,509,787,517	$462,606,433,000	30,338	$519,537,378
1998	4,235,138	$1,668,246,681	$497,621,083,000	57,348	$886,327,133
1999	4,329,985	$1,719,652,696	$534,117,781,000	47,247	$754,970,800
2000	4,369,087	$1,723,824,570	$567,568,653,000	16,362	$251,720,536
2001	4,458,470	$1,740,331,079	$611,918,920,000	43,589	$1,277,002,489
2002	4,519,799	$1,802,277,937	$653,776,126,000	25,312	$433,644,094
2003	4,565,491	$1,897,687,479	$691,786,140,000	36,838	$780,492,440
2004	4,667,446	$2,040,828,486	$765,205,681,000	55,825	$2,232,042,331
2005	4,962,011	$2,241,264,140	$876,679,658,000	212,778	$17,713,105,660
2006	5,514,895	$2,604,844,133	$1,054,087,148,000	24,592	$640,623,771
2007	5,655,919	$2,843,422,049	$1,141,242,230,000	23,129	$612,351,594
2008	5,684,275	$3,066,729,200	$1,197,659,846,000	74,266	$3,450,249,017
2009	5,704,198	$3,202,267,224	$1,233,005,263,000	30,821	$772,390,723
2010	5,559,313	$3,348,222,091	$1,227,932,424,400	27,165	$708,992,043

Source: U.S. Department of Homeland Security, FEMA's Office of Legislative Affairs.

NFIP Treasury Borrowing

Table 3 shows the history of U.S. Treasury borrowing and repayments under the NFIP from 1981 to 2010. The NFIP was self-supporting from 1986 until 2005, covering all administrative expenses and claim payments out of premium income and fees. Since Hurricane Katrina struck in August 2005, FEMA has had to borrow $19.64 billion, which includes amounts to pay claims from Hurricanes Ike and the 2008 Midwest floods. It appears unlikely that the $17.775 billion in debt to the U.S. Treasury, as of January 31, 2011, will be repaid within the next 10 years given annual interest payments of about $900 million and annual premium income of approximately $3.1 billion. Experts agree that even if FEMA increased flood insurance rates up to the maximum amount allowed by law (10% per year), the program would still not have sufficient funds to cover future obligations for policyholder claims, operating expenses, and interest on debt.

Table 3. History of U.S. Treasury Borrowing Under the National Flood Insurance Program

(as of January 31, 2011; $ nominal)

Fiscal Year	Amount Borrowed	Amount Repaid	Cumulative Debt
Prior to 1981[a]	$917,406,008	$0	$917,406,008
1981	$164,614,526	$624,970,099	$457,050,435
1982	$13,915,000	$470,965,435	$0
1983	$50,000,000	$0	$50,000,000
1984[b]	$200,000,000	$36,879,123	$213,120,877
1985	$0	$213,120,877	$0
1986-1993	$0	$0	$0
1994[c]	$100,000,000	$100,000,000	$0
1995	$265,000,000	$0	$265,000,000
1996	$423,600,000	$62,000,000	$626,600,000
1997	$530,000,000	$239,600,000	$917,000,000
1998	$0	$395,000,000	$522,000,000
1999	$400,000,000	$381,000,000	$541,000,000
2000	$345,000,000	$541,000,000	$345,000,000
2001	$600,000,000	$345,000,000	$600,000,000
2002	$50,000,000	$640,000,000	$10,000,000
October 2002	$0	$10,000,000	$0
2003 (Nov-Sep)	$0	$0	$0
2004	$0	$0	$0
2005[d]	$300,000,000	$75,000,000	$225,000,000
2006	$16,660,000,000	$0	$16,885,000,000
2007	$650,000,000	$0	$17,535,000,000
2008	$50,000,000	$225,000,000	$17,360,000,000
2009	$1,987,988,421	$347,988,421	$19,000,000,000

Fiscal Year	Amount Borrowed	Amount Repaid	Cumulative Debt
2010	$0	$500,000,000	$18,500,000,000
2011 to date	$0	$750,000,000	$17,750,000,000
Total	$23,707,523,955	$5,957,523,955	$17,750,000,000

Source: U.S. Department of Homeland Security, Federal Emergency Management Agency's Office of Legislative Affairs.

Notes: Borrowings through 1985 were repaid from congressional appropriations. The NFIP did not borrow in from 1986 through 1993. Since 1994, borrowings are repaid from premium and other income. The existing debt outstanding is expected to be repaid with premium income or with congressional appropriations.

a. Balance forward from U.S. Department of Housing and Urban Development.

b. Figure for the $213.1 million in cumulative debt in 1984 provided by FEMA reflects additional cost outside of the insurance program.

c. Of the $100 million borrowed, only $11 million was needed to cover obligations.

d. NFIP borrowed $300 million in 2005 to pay claims from the 2004 hurricane season, but Hurricanes Katrina, Rita and Wilma struck on August 29, 2005 and claims were submitted after the 2006 fiscal year began.

Factors Affecting Financial Solvency

Homeowners are required to purchase flood insurance coverage if they have a federally insured mortgage. Many policyholders, however, cancel their NFIP policy after a few years pass and they have not experienced a flood loss. As a result, when a flood hazard does occur, there are often a large number of uninsured flood victims and the federal government is usually called upon to provide disaster assistance. In order to stabilize future government spending to compensate flood victims, it is important to maintain the long-term financial solvency of the NFIP. In considering the NFIP's financial solvency, it may be useful to recognize two things: (1) the NFIP was not capitalized at inception by Congress; and (2) the program does not operate under the traditional insurance definition of fiscal solvency that requires the insurer to have sufficient capital/surplus to obtain authorization to sell insurance policies.

With respect to the financial solvency of the NFIP, several issues may be of interest to Congress, including the following:

- flood insurance premium discount (i.e., actuarial soundness and premium rate adequacy);
- repetitive loss properties' disproportionate share of total losses in the program;
- lack of enforcement of mandatory flood insurance purchase requirements;
- impact of outdated flood maps on the program;
- enforcement of floodplain management regulations; and
- debate over the inclusion of optional windstorm coverage in the NFIP policy.

The next six sections examine each of these concerns.

Flood Insurance Premium Discounts

The NFIP arguably faces a long-term solvency challenge because the program does not have a financing mechanism for handling catastrophic losses other than borrowing from the federal Treasury; annual premiums are not likely to cover the program's long-term expenses, claim costs, and interest and principal debt repayment to the U.S. Treasury. Taxpayers could therefore be exposed to greater financial risks as a result of the potential for future catastrophic flooding.[13]

NFIP was not established on an actuarially sound basis since it charges less-than actuarial rates for pre-FIRM structures. FEMA's rate-setting structure is designed to generate premiums at least sufficient to cover losses and loss adjustment expenses relative to the "historical average loss year."[14] There is no contingent amount added to premium for profit margins in order to build a surplus. When losses and expenses exceed premiums the program is authorized to borrow from the U.S. Treasury but must repay the funds with interest. Thus, because the program does not build loss reserves for the infrequent but very catastrophic loss years and rates are by statute underpriced to make rates affordable, the program's financial structure could impose negative externalities on taxpayers. Federal taxpayers ultimately subsidize any financial shortfalls created by the NFIP's financial structure and the tendency to underprice the insurance coverage.

The NFIP uses a two-tier rate classification system that consists of "actuarial" rates and "subsidized" rates.[15] Actuarial flood insurance premiums are calculated based on the amount of coverage, location, age, and building occupancy and, for a building in a SFHA, the elevation of the building. Based on expected losses derived from flood probability estimates and adding expected loss adjustments and other operating expenses (i.e., risk loading), FEMA is able to calculate an actuarial rate. Buildings constructed after December 31, 1974 or after the publication of a flood insurance rate map (FIRM) are charged an actuarial premium that reflects the property's risk of flooding.

Subsidized rates, on the other hand, are determined by a statutory mandate that requires rates to be affordable so individuals are encouraged to participate. Owners of properties built prior to the issuance of a community's flood hazard map or January 1, 1974, usually pay subsidized rates and are exempted from the NFIP's floodplain management standards. Even properties that are remapped into higher-risk areas pay the subsidized rates, which further contributes to the financial inadequacies of the NFIP.

Premium subsidies were initially considered necessary because occupants often did not understand the flood risk when they built in floodplains (flood maps were not available), there were no public safeguards prohibiting the occupancy on the floodplain, and premium subsidies on pre-FIRM structures could provide an incentive to local communities to participate in the program and discourage unwise future floodplains construction. Premium subsidies were

[13] U.S. Government Accountability Office, *FEMA's Rate-Setting Process Warrants Attention*, GAO-09-12, October 31, 2008.

[14] In contrast, commercial insurance premiums are typically set at a level that covers expected losses and expenses plus an amount for a profit margin. A portion of each premium dollar collected is then set aside in loss reserves which are invested and the income used to pay claims and expenses.

[15] A third category of premium discounts involve "grandfathered" policies that occur when a structure is built in compliance with the local floodplain regulation in effect at the time of construction but is later placed in a different risk zone when a flood map is changed. The structure is grandfathered so that pre-FIRM structures continue to pay the subsidized rates.

intended to be phased out over time as the number of pre-FIRM properties gradually diminished when they were damaged and rebuilt or relocated under stronger floodplain management and building codes. The NFIP requires all new and substantially improved buildings to be constructed at or above the elevation of the 1%-annual-chance flood (100-year floodplain).

Repetitive Flood Loss Properties

Properties that experience repetitive flood losses, known as a "repetitive-loss properties" (RLP) and "severe repetitive loss properties"(SRLP), account for a disproportionately large share of all the flood insurance claims filed and paid under the NFIP.[16] Historically, it is estimated that approximately 1% of the properties insured under the NFIP have accounted for over a third of claims paid. About one in 10 homes that suffer repetitive flood damages have cumulative flood insurance claims that have exceeded the value of the house. [17] FEMA approximates that 90% of all RLPs were built prior to December 31, 1974, or before the adoption of a FIRM—and, hence, are subject to premium discounts. Importantly, the annual increase in new RLPs is outpacing FEMA mitigation efforts by a factor of 10 to 1. After the 1993 Midwest flood, FEMA and other federal government agencies spent hundreds of millions to remove frequently flooded properties from the floodplain.

Table 4 shows that since 1978, a total of 157,225 RLPs have had 461,580 claims paid, which have cost the National Flood Insurance Fund a total of $11.1 billion in nominal dollars. The **Appendix** shows RLPs by state. The average claim for these properties was $24,035.

Table 4. Total Repetitive Flood Loss Properties in the NFIP: 1978 - 2011

(as of January 31, 2011: $ nominal)

Building Payments	$8,480,003,703
Contents Payments	$2,614,161,770
Total payments	$11,094,165,472
Average payment	$24,035
Number of Losses	461,580
Number of Properties	157,225

Source: U.S. Department of Homeland Security, Federal Emergency Management Agency.

FEMA has undertaken several actions over the years to address the RLP problem. The initial strategy, announced in 1999, was to identify the nation's inventory of RLPs and focus on structures that were substantially damaged (i.e., damaged 50% or more of market value) at which time they would be reconstructed, elevated, or floodproofed to prevent future damage. One

[16] A repetitive loss property (RLP) is defined as an insured property that experiences two or more flood losses greater than $1,000 within any 10-year period. A subset of RLPs, called severe repetitive loss properties (SRLP), have incurred at least four NFIP claim payments of at least $5,000 each or the cumulative amount of such claims payments exceeds $20,000 or for which at least two separate claims have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.

[17] U.S. Department of Homeland Security, Office of Inspector General, "FEMA's Implementation of the Flood Insurance Reform Act of 2004," OIG-09-45, March 26, 2009, p. 4, at http://www.dhs.gov/xoig/assets/mgmtrpts/OIG_09-45_Mar09.pdf.

reported difficulty has been reluctance and inconsistency at the local community level in declaring structures substantially damaged.

FEMA also pursued a strategy of phasing out premium subsidies on RLPs through voluntary buyouts or the imposition of full actuarially based rates for RLP owners who refuse to accept FEMA's offer to mitigate the effect of flood damage. In addition, the agency incorporated special incentives into the Community Rating System and provided data to states and communities to help them address the RLPs.

The Flood Insurance Reform Act of 2004 required FEMA to establish the Repetitive Flood Claims and the Severe Repetitive Loss Grant programs to provide funding to reduce or eliminate the long-term risk of flood damage under the NFIP. The RFC grant program provides grants to help states provide subgrants to local government to acquire properties and either demolish or relocate the structure, or elevate or otherwise floodproof the structure. Congress has appropriated $10 million annually to the RFC grant program since 2006. Going forward, a policy challenge will be to find a way to mitigate RLP given that FEMA cannot directly compel property owners in flood hazard areas to mitigate losses or impose actuarial rates on RLP.

Mandatory Flood Insurance Purchase Requirement

FEMA lacks nationwide data on the number of properties in floodplains: it is therefore difficult to make an accurate assessment of NFIP market penetration. However, estimates of penetration rates in the 100-year floodplain are arguably consistently low. A 2006 Rand Corporation study estimated that about 49% of properties in SFHAs purchased NFIP flood insurance, and 1% of properties outside SFHAs purchased insurance.[18] Concerns have also been expressed about the large number of homes that are not mortgaged and thus are not required to be insured against flood risks. The low participation rates in flood-prone areas may be of concern to Congress.

The intent and success of the NFIP rests on making insurance widely available and property owners and renters purchasing coverage. Since 1973, federal regulations have required flood insurance on all structures located in the 1% annual chance floodplain (100-year floodplain). Also, since 1994, recipients of certain flood disaster assistance have been required to purchase and hold flood insurance to protect against future flood losses, under penalty of receiving no federal disaster aid in subsequent floods.[19] Despite the existence of this mandatory flood insurance purchase requirement, take-up rates for flood insurance have historically been low and the federal government's exposure to uninsured property losses from flooding remains substantial. There are at least five possible explanations for the low market penetration for flood insurance: (1) flood insurance is not seen as being worth the cost (i.e., a poor investment); (2) the individual has misperceptions about low-probability risks and lacks information about the NFIP;[20] (3) private insurance agents do not market NFIP policies; (4) lack of compliance with the mandatory purchase requirement or failure to ensure that property owners maintain coverage for the life of the loan; and (5) many homeowners in risky areas either do not have a mortgage or

[18] Rand Institute for Civil Justice, "The National Flood Insurance Program's Market Penetration Rate: Estimates and Policy Implications," at http://www.rand.org/pubs/technical_reports/2006/RAND_TR300.pdf.

[19] CRS Report RS22945, *Flood Insurance Requirements for Stafford Act Assistance*, by Edward C. Liu.

[20] Howard C. Kunreuther, "The Changing Societal Consequences of Risks from Natural Hazards." Annals of the American Academy of Political and Social Science 1979, vol. 443, pp. 104-116.

have a mortgage from an unregulated lender that is not subject to the mandatory purchase requirement.

Flood Hazard Mapping

FEMA is required by statute to identify and map the nation's floodplain areas and to establish flood-risk zones in such areas. FIRMs are used for setting flood insurance rates, regulating floodplain development and communicating information about the 1%-annual-chance flood hazard to those who live in floodplains. FIRMs also are used to determine whether property owners are required by law to obtain flood insurance as a condition of obtaining mortgage loans or other federally related financial assistance. Without accurate and updated flood hazard maps, property owners and small businesses could underestimate their exposure to flood risks and make poor financial decisions about protecting their properties (i.e., where to build and whether to purchase flood insurance or take other measures to protect their properties).

A major challenge facing the NFIP is ensuring the accuracy of the nation's inventory of FIRMS and improving the mapping, communication, and management of flood-related data. Other flood risk assessment and mapping issues that may be of concern to Congress include (1) the sudden inclusion in a floodplain that can result from FEMA Map Modernization program; (2) large areas that appear to be outside of SFHA that should actuarially be in the high-hazard area; (3) hazard mitigation and local planning for capital investments behind suspect levees and below aging dams so property owners will continue to be exempt from the mandatory purchase requirements;(4) expiring Provisional Accredited levee agreements; and (5) certification/liability issues with levee-like structures.[21]

When FEMA's map modernization program began in 2003, nearly 70% of the nation's 92,222 flood maps were more than 10 years old and many of these maps did not reflect the current flood hazard risk or new estimation techniques.[22] In many cases, water flow and drainage patterns have changed due to surface erosion, land use and natural forces. The probability of inland and riverine flooding in certain areas has changed along with these factors. Most experts agree that flood maps with high-accuracy and high-resolution land surface elevation data would be helpful. The benefits of accurate flood hazard maps include improved risk zone designations as well as insurance premiums and building restrictions that reflect actual flood risks facing individuals and businesses.

The Map Modernization program called for FEMA to produce a new nationwide Flood Insurance Study (FIS) and the accompanying FIRMs.[23] FEMA is now completing the update and conversion to digital food hazard maps using new technologies such as Light Detection And Ranging (LiDAR) and other remote sensing technologies within a geographic information system (GIS) format to systematically update floodplain maps on a watershed scale.

[21] National Committee on Levee Safety, *Recommendations for a National Levee Safety Program: A Report to Congress from the National Committee on Levee Safety*, January 15, 2009, at http://www.iwr.usace.army.mil/ncls/docs/NCLS-Recommendation-Report_012009_DRAFT.pdf.

[22] U.S. Government Accountability Office, *Flood Map Modernization: Federal Emergency Management Agency's Implementation of a National Strategy*, GAO-05-894, July 12, 2006.

[23] For more information on FEMA's Map Modernization, see *FEMA Map Modernization: An Overview*, http://www.fema.gov/plan/prevent/fhm/mm_main.shtm.

Any community that currently participates in the NFIP, or is now identified as having flood hazard prone areas in the FIS and on the new FIRMs, must officially adopt the county-wide FIS and the accompanying FIRMs. Such official action is the most critical community action that FEMA requires of all communities having flood hazard prone areas. Any participating community failing to meet the FEMA map adoption deadline faces immediate suspension or sanctions from the NFIP.

In October 2008, FEMA announced the discontinuation of the paper FIRMS, FIS reports, and related flood hazard map products.[24] Only digital map images and digital geospatial flood hazard data will be distributed by FEMA and are equivalent to the paper maps for official activities under the NFIP. The paper maps will still be available through the FEMA Map Service Center. This change is expected to result in printing and distribution cost savings for FEMA during the map modernization process by eliminating the need to generate large format film negatives to support offset printing.[25] FEMA has also announced its Risk Mapping, Assessment, and Planning Strategy aims to follow-up to the Map Modernization initiative. The new strategy aims to combine flood hazard mapping, risk assessment tools, and mitigation planning into one seamless program.

Floodplain Management Regulations

FEMA is prohibited from providing flood insurance to property owners residing in communities that do not participate in the NFIP.[26] Local communities must adopt and enforce certain minimum floodplain management ordinances as a condition of participation in the NFIP. FEMA estimates that $1.2 billion in flood losses are avoided each year from community floodplain management requirements. Efforts to guide construction and development away from high-risk areas through community-based land use and zoning ordinances, however, have reportedly been subordinated to building and elevation requirements that lead to further development of the floodplains, according to the National Wildlife Federation.[27] Even in hazard-prone floodways and coastal areas, building and rebuilding are allowed under NFIP standards, with the cost of insurance varying with property elevation.

An important floodplain management issue for the 112th Congress is reconciling FEMA's implementation of its policy on federal assistance for recovery and hazard mitigation projects located in coastal velocity zones—the so-called V zones on FIRMS—with that of other federal departments and agencies charged with implementing Executive Order 11988.[28] President Jimmy Carter signed into law E.O. 11988 to require federal agencies to avoid direct and indirect support of floodplain development by taking action "to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities."[29]

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[24] U.S. Department of Homeland Security, Federal Emergency Management Agency, "FEMA: Availability of Flood Hazard Maps and Data," *Federal Register*, vol. 73, no. 206, October 23, 2008, p. 63184.

[25] Ibid.

[26] 44 CFR 59.21.

[27] National Wildlife Federation, *Heavy Rainfall and Increased Flooding Risk: Global Warming's Wake-up Call for the Central United States*, 2008, at http://www.nwf.org/extremeweather/pdfs/Heavy_Rainfall_and_Increased_Flooding-Wake-Up_Call_for_Central_U.S2.pdf.

[28] U.S. Department of Homeland Security, Office of Inspector General, "FEMA Policy Related to Coastal Velocity Zones," OIG-09-71, May 27, 2009, at http://www.dhs.gov/xoig/assets/mgmtrpts/OIG_09-71_May09.pdf.

[29] U.S. President Jimmy Carter, "Floodplain Management" Executive Order 11988, *Federal Register*, May 24, 1977, p. (continued...)

Although the regulatory guidelines for E.O. 11988 are clearly outlined in 44 CFR Part 9, there has arguably been a lack of clarity in interpreting those guidelines to determine whether officials are to support recovery and community development in V Zones. FEMA staff must (1) determine eligibility and required elevation of all new construction in coastal high hazard areas on the Gulf Coast; and (2) decide whether new structures or the costs of repair or replacement of facilities in V Zones are eligible for FEMA funding. The decision to approve and obligate FEMA recovery funds for public assistance projects located in V Zones is an essential element in the reconstruction or redevelopment of coastal areas devastated by Hurricane Katrina.

Federal Multi-Peril Insurance Program

In the aftermath of Hurricanes Katrina and Rita, individuals and businesses in Louisiana, Mississippi, and Alabama protested against what they claimed were inappropriate obstacles to the payment of their property damage insurance claims. When insurance adjustors and damage experts assessed the properties damaged by Hurricane Katrina, they were faced with the issue of allocating damages between wind (a covered loss) and flood (an excluded loss). Post-Katrina insurance claims litigation and the delays and economic uncertainty generated for consumers and insurers raised concerns about post-event judicial interpretations of the scope of insurance coverage.

One issue of contention that emerged from the wind vs. water claims dispute was the interest in expanding the NFIP to allow policyholders to purchase optional wind coverage. Proponents of adding the wind peril provision argue it is necessary to eliminate coverage disputes when wind and flood both contribute to a loss. Optional wind coverage is also said to be needed because of the difficulty that property owners have in obtaining affordable private wind coverage in states along the Gulf and Atlantic coasts. Private insurers have dramatically increased premiums and deductibles, reduced coverage or withdrawn altogether from these areas out of concern about catastrophic risk exposure. In those areas, homeowners must instead purchase their wind coverage from state pools, where the premiums can be prohibitively expensive.

Opponents of adding wind coverage to the NFIP believe that there is adequate wind coverage capacity in every state through either the traditional private market or through the state residual market program (e.g., wind pools). Some critics of the optional wind proposal would instead like to see the development of federal programs to provide economic incentives to encourage the adoption and enforcement of stronger building codes and other loss mitigation efforts. According to these critics, expanding the NFIP to add wind coverage would dramatically increase the exposure of the NFIP, losses to the federal government and the potential for huge taxpayer subsidies. Concerns have also been expressed about the NFIP's ability to determine actuarially sound rates for the windstorm portion of this coverage and avoid wide-scale financial deficits in the program following a catastrophic flood event. Even if actuarial rates are implemented they may not produce sufficient premium income to bear program administration costs and losses in the event of a catastrophic event.

The Government Accountability Office (GAO) issued a report in 2008 that outlined some difficulties that FEMA could face in implementing an optional wind coverage provision. Some of the obstacles included (1) the concern about "adverse selection" or the likelihood that only those

(...continued)

26951, at http://www.fema.gov/plan/ehp/ehplaws/attachments-laws/eo11988.pdf.

property owners at highest risk would purchase coverage; (2) wind hazard prevention standards that communities would have to adopt in order to receive coverage; (3) uncertainty about the adoption of programs to accommodate wind coverage; (4) difficulties in establishing a new rate-setting process; (5) enforcement of new building codes; and (6) administration and oversight of the program.[30]

Options for Managing and Financing Flood Risk

Despite investing significant resources in managing flood risk and minimizing future disaster relief costs, the United States has not been able to curb the rising costs of flood damage. This was the conclusion of the Gilbert F. White National Flood Policy Forum held in November 2007 at George Washington University. The Forum brought together 92 diverse experts to consider the future of floodplain management under a "business-as-usual scenario" and under an alternative scenario of aggressive action to address increasing flood risk in the nation. The experts at the forum concluded that (1) an unprecedented set of conditions (e.g., population growth and migration, changes in climate, and degradation of water-based resources) now face the United States that could increase flood losses more rapidly in the near future; and (2) existing programs and policies at all levels are short-sighted, fragmented, focused on economic development at the expense of sustainability and that future losses must be managed more pro-actively than in the past.[31]

What might the policy response be to the current financial and management challenges facing the NFIP? There are at least five options.

- **Reform and modernize the NFIP.** Reform of the NFIP could include (1) a gradual phase in of actuarial rates for non-residential properties, non-primary residences and RLPs; (2) strengthening floodplain management regulations designed to restrict development in high-risk areas, and require new construction to be elevated three feet above the base flood elevation (BFE); (3) authorizing an ongoing program to review, update, and maintain flood insurance program maps and include 500-year floodplains and areas that are behind levees, downstream of a dam, or in a coastal area that could see a major hurricane; (4) strengthening and enforcing mandatory insurance purchase requirements; (5) forgiving the full debt owed by the NFIP to the Treasury; (6) eliminating the current subsidy for older structures and expand to include areas where a flood or storm surge is likely if a weather event reaches catastrophic levels; (7) creating a catastrophe reserve fund for extremely rare catastrophic loss years; and (8) encouraging private sector incentives for participation.
- **Long-term flood insurance contracts (LTFI).** LTFI coupled with mitigation loans arguably would encourage investment in risk-reduction measures.[32] The

[30] U.S. Government Accountability Office, GAO-08-504, *National Catastrophe Insurance: Analysis of Proposed Combined Federal Flood and Wind Insurance Program*, April 25, 2008.

[31] Association of State Flood Plain managers, *Floodplain Management 2050: A Report of the 2007 Assembly of the Gilbert F. White National Flood Policy Forum*, November 6-7, 2007.

[32] See Carolyn Kouky and Howard Kunreuther, "Improving Flood Insurance and Flood Risk Management: Insights from St. Louis, Missouri," *Resources for the Future*, February 2009, at http://www.rff.org/rff/documents/rff-dp-09-07.pdf.

idea is for private insurers to offer 5-, 10-, or 20-year flood insurance contracts combined with long-term mitigation loans (e.g., for retrofitting, elevation, and floodproofing of structures) tied to the mortgage. Mitigation loans would be offered to help finance the high upfront costs associated with investing in mitigation measures. The long-term flood insurance policies would have a maturity that corresponds to the length of the mortgage on the property and the policy would not terminate when the property owner sells the property.

The economic rationale for using LTFI to pre-fund disaster costs is that insurers, generally, need guaranteed premiums for a long time period if rates are to be based on expected losses. By lengthening the term of the property insurance contract, and spreading the risk through a mandatory purchase requirement, LTFI contracts could implicitly permit insurers to compensate for their present inability to prepare adequately for rare and unpredictable flood events.

- **Shift flood insurance back into the private sector.** FEMA has a responsibility to examine the NFIP's contingent liabilities and recommend ways to provide financial stability to the federal flood insurance program. This activity is performed in conjunction with the program's annual rate-setting process. Recognizing the shortcomings of the current financing arrangement, two basic alternatives have emerged: an all-hazard insurance approach and a federal-insurance (reinsurance) framework that would enable private insurers to cover more flood risks.

  With the development of computer simulation catastrophe risk models and remote sensing technologies, some private insurers have argued that flood hazards are now insurable by private companies working in partnership with government. Some economists have suggested that floods and other catastrophic risks are now insurable because of insurer's ability to transfer catastrophic risks to the capital markets through securitization of the risk. In this context, FEMA could require private insurers to "make available" private flood insurance policies at actuarially determined prices in flood-prone areas with the federal government providing federal reinsurance. FEMA could also open the NFIP to a competitive bid contractor to have one firm take over the entire Write-Your-Own program and the government reinsure the risk.

  In 2000, FEMA undertook a study with the assistance of accounting firm Deloitte & Touche to explore alternative financing arrangements to reduce the need for U.S. Treasury borrowing.[33] FEMA was concerned about the NFIP's erratic cash flow and the potential for catastrophic losses within a short period of time. The option that received the most attention was to create a reinsurance vehicle to finance catastrophic losses. After review by the Office of Management and Budget (OMB), this option was not adopted because it was determined that the cost to borrow from the U.S. Treasury was lower.

- **Community Group Flood Insurance Policy.** The local community purchases a group policy from the NFIP on behalf of residents in a designated SFHA. Policies are issued to all residents and paid either through property taxes or as a utility payment. Professor Dwight Jaffee at University of California, Berkley, and

[33] Federal Emergency Management Agency, *National Flood Insurance Program: Discussion of Financial Stabilization Possibilities*, FEMA Unpublished Internal Document, November 20, 2000.

Howard Kunreuther at the Wharton School, the University of Pennsylvania are leading advocates for the long-term flood insurance contract proposal.[34]

- **Interstate Compacts for Flood Control and Management.** In response to recurring flooding on the Red River, Members of the 112th Congress may wish to consider addressing the long-term flooding challenges facing residences along the Red River Valley. One way to do this would be to create a Red River Valley Interstate Compact Authority with the power to address water quality and flooding issues in the Red River watershed.[35] Some disaster experts believe this could potentially serve as a model for the nation. Officials from North Dakota, South Dakota, and Minnesota envision this entity as an efficient and cost-effective approach to handling the high cost of maintaining dams and levees, land purchases for water retention, diversion of the river, and reducing the time it takes to complete water management projects. Before any request for an interstate compact were presented to Congress, the state legislatures in North Dakota, South Dakota and Minnesota might need to approve separate resolutions to set up the compact. The status quo is an ad hoc approach with multiple states each responding to its own flood hazards and the federal government providing post-disaster relief assistance.

[34] Dwight Jaffee and Howard Kunreuther and E. Michael-Kerja, "Long-Term Insurance for Addressing Catastrophic risk," *National Bureau of Economic Research Working Paper*, August 2008.

[35] *Officials Seek Long-Term Solution for Red River Flood Control*, by Dan Gunderson, January 20, 2010, located at http://minnesota.publicradio.org/display/web/2010/01/19/red-river-flood-plans/.

Appendix. National Flood Insurance Program: Repetitive Flood Loss Properties

Table A-1. Repetitive Flood Loss Properties in the National Flood Insurance Program

(as of January 31, 2011; $ nominal)

State Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
Alabama	$400,834,596.31	$80,774,339.67	$481,608,935.98	$35,125.73	13,711	4,808
Alaska	750,670.54	113,603.42	864,273.96	11,839.37	73	28
Arizona	7,450,558.54	1,337,779.96	8,788,338.50	14,845.17	592	257
Arkansas	23,011,224.88	8,117,340.97	31,128,565.85	17,920.88	1,737	613
California	152,307,758.95	37,285,339.66	189,593,098.61	21,105.77	8,983	3,265
Colorado	951,272.38	334,658.34	1,285,930.72	10,046.33	128	55
Connecticut	50,471,305.22	17,807,466.90	68,278,772.12	15,574.54	4,384	1,467
Delaware	21,918,262.36	12,592,486.65	34,510,749.01	34,894.59	989	363
District Columbia	595,978.08	16,919.85	612,897.93	18,572.66	33	14
Florida	1,066,643,326.93	282,305,083.66	1,348,948,410.59	32,266.09	41,807	16,475
Georgia	102,514,382.18	26,662,103.48	129,176,485.66	29,736.76	4,344	1,602
Guam	350,626.18	52,467.45	403,093.63	13,899.78	29	14
Hawaii	9,633,475.42	2,243,355.12	11,876,830.54	24,846.93	478	168
Idaho	577,539.26	99,298.69	676,837.95	11,669.62	58	23
Illinois	117,408,150.37	25,182,703.84	142,590,854.21	12,355.16	11,541	3,813
Indiana	50,097,108.25	10,006,920.62	60,104,028.87	16,062.01	3,742	1,384
Iowa	48,431,623.76	11,606,692.82	60,038,316.58	23,162.93	2,592	1007
Kansas	20,209,688.27	9,079,441.57	29,289,129.84	23,831.68	1,229	434
Kentucky	81,816,969.44	26,548,408.91	108,365,378.35	18,892.15	5,736	1,772
Louisiana	1,991,308,397.79	637,037,282.21	2,628,345,680.00	27,397.72	95,933	29,279
Maine	9,846,680.32	2,791,201.38	12,637,881.70	20,650.13	612	227
Maryland	40,063,422.42	15,207,780.67	55,271,203.09	26,083.63	2,119	883
Massachusetts	124,519,565.79	27,189,404.96	151,708,970.75	17,618.04	8,611	2,976
Michigan	12,650,629.95	5,025,034.94	17,675,664.89	10,817.42	1,634	636
Minnesota	21,705,222.50	3,628,123.23	25,333,345.73	16,460.91	1,539	622
Mississippi	433,058,921.46	129,521,515.24	562,580,436.70	32,809.26	17,147	5,976
Missouri	196,078,881.19	93,805,275.77	289,884,156.96	16,969.16	17,083	4,930
Montana	802,931.06	114,904.58	917,835.64	9,271.07	99	45
Nebraska	7,822,972.41	2,862,518.14	10,685,490.55	11,807.17	905	366
Nevada	6,955,148.57	3,435,927.12	10,391,075.69	59,377.58	175	76

State Name	Building Payments	Contents Payments	Total Payments	Average Payment	Losses	Properties
New Hampshire	17,200,468.92	2,663,197.29	19,863,666.21	23,043.70	862	337
New Jersey	459,644,468.67	162,088,184.02	621,732,652.69	18,990.00	32,740	10,322
New Mexico	1,187,339.29	60,885.43	1,248,224.72	13,716.76	91	39
New York	237,758,052.44	82,384,680.16	320,142,732.60	13,522.40	23,675	8,688
North Carolina	349,324,008.07	60,328,216.73	409,652,224.80	19,247.86	21,283	7,769
North Dakota	13,681,399.91	1,832,343.22	15,513,743.13	24,202.41	641	273
Ohio	72,300,428.51	24,711,627.74	97,012,056.25	17,635.35	5,501	1,990
Oklahoma	44,840,257.16	14,091,973.48	58,932,230.64	19,366.49	3,043	937
Oregon	17,510,705.12	5,702,259.30	23,212,964.42	25,965.28	894	341
Pennsylvania	333,353,670.62	107,637,434.18	440,991,104.80	24,447.89	18,038	6,587
Puerto Rico	15,938,654.24	38,547,251.72	54,485,905.96	8,882.61	6,134	2,093
Rhode Island	24,886,412.12	11,383,376.76	36,269,788.88	33,897.00	1070	384
South Carolina	70,507,605.94	15,534,613.84	86,042,219.78	22,987.50	3,743	1,480
South Dakota	2,927,068.46	466,431.54	3,393,500.00	14,627.16	232	106
Tennessee	45,051,665.47	13,031,536.49	58,083,201.96	19,843.94	2,927	1027
Texas	1,316,561,411.51	464,741,103.82	1,781,302,515.33	27,449.42	64,894	20,458
Utah	895,525.28	202,236.88	1,097,762.16	19,258.99	57	23
Vermont	1,894,526.85	563,161.71	2,457,688.56	14,372.45	171	72
Virgin Islands	11,932,975.99	22,051,880.60	33,984,856.59	50,125.16	678	251
Virginia	246,402,631.42	51,293,547.59	297,696,179.01	21,444.76	13,882	5,543
Washington	83,674,120.25	17,561,559.21	101,235,679.46	26,845.84	3,771	1,316
West Virginia	91,961,005.04	39,889,135.57	131,850,140.61	17,015.12	7,749	2,981
Wisconsin	19,575,744.44	4,578,718.28	24,154,462.72	16,785.59	1,439	621
Wyoming	206,266.45	31,034.15	237,300.60	10,786.39	22	9
Total	$8,480,003,702.95	$2,614,161,769.53	$11,094,165,472.48	$24,035.20	461,580	157,225

Source: U.S. Department of Homeland Security, Federal Emergency Management Agency.

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