

# **Flood-Risk Reduction and Resilience: Federal Assistance and Programs**

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## Summary

Recent flood disasters have raised congressional and public interest in not only reducing flood risks, but also improving flood resilience, which is the ability to adapt to, withstand, and rapidly recover from floods. In the United States, flood-related responsibilities are shared. States and local governments have significant discretion in land-use and development decisions, which can be major factors in determining the vulnerability to and consequence of hurricanes, storms, extreme rainfall, and other flood events. Congress has established various federal programs that may be available to assist U.S. state, local, and territorial entities and tribes in reducing flood risks. Among the most significant federal activities to reduce communities' flood risks and improve flood resilience are

- assistance with infrastructure projects (e.g., levees, shore protection) and other flood mitigation activities that save lives and reduce property damage; and
- mitigation incentives for communities that participate in the National Flood Insurance Program (NFIP).

This report provides an overview of these assistance programs and the NFIP-related mitigation incentives; it also raises flood-related policy considerations associated with federal programs and practices.

### Assistance Programs

Each federal program that provides flood-related assistance has its own focus, statutory limitations, and way of operating. Some programs are triggered by certain declarations or actions and may be available only to areas or states subject to recent disasters. These programs include

- the Hazard Mitigation Grant Program (HMGP) administered by the Federal Emergency Management Agency (FEMA), which is triggered by a Stafford Act disaster declaration; and
- Community Development Block Grant–Disaster Recovery (CDBG–DR) assistance administered by the Department of Housing and Urban Development (HUD), which may be available if Congress provides supplemental appropriations.

Although subject to available appropriations, other federal assistance may be more broadly accessible. These assistance programs include

- FEMA's Pre-Disaster Mitigation (PDM) grant program and the Flood Mitigation Assistance (FMA) grant program;
- U.S. Army Corps of Engineers (USACE) risk-reduction projects;
- U.S. Department of Agriculture (USDA) acquisition of floodplain easements and flood-risk-reduction project grants;
- National Oceanic and Atmospheric Administration (NOAA) coastal resilience grants;
- U.S. Environmental Protection Agency (EPA) support for state-administered loan programs and direct credit assistance for stormwater management; and
- HUD's Community Development Block Grant (CDBG) programs.

## **Flood Insurance**

In order for federal flood insurance to be available to homeowners and business owners in a community, the NFIP requires participating communities to develop and adopt flood maps and enact minimum floodplain standards based on those flood maps. The NFIP encourages communities to adopt and enforce floodplain management regulations such as zoning codes, building codes, subdivision ordinances, and rebuilding restrictions. The NFIP also encourages communities to reduce flood risk through three programs: the FMA, Community Rating System, and Increased Cost of Compliance (ICC) coverage.

## **Context for Federal Activities and Policy Considerations**

Since the 1960s, the federal role in responding to catastrophic and regional flooding has expanded both through the NFIP and federal disaster response and recovery efforts. Hurricane Katrina and subsequent events have generated concern about the nation's and the federal government's financial exposure to flood losses and floods' economic, social, and public health impacts on individuals and communities. Members of Congress and other decisionmakers are faced with numerous policy questions, including whether federal programs provide incentives or disincentives for state and local entities to prepare for floods and manage their flood risks, and whether changes to how federal assistance programs and the NFIP are implemented and funded could result in long-term resilience benefits.

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## Introduction

Recent flood disasters have raised congressional and public interest in not only reducing flood risks, but also improving flood resilience, which is the ability to adapt to, withstand, and rapidly recover from floods. Congress has established various federal programs that may be available to assist U.S. state, local, and territorial entities and tribes in reducing flood risks. Among the most significant current federal programs assisting communities with improvements to reduce their flood risks and improve their flood resilience are (1) programs that assist with flood-risk-reduction infrastructure and other flood mitigation activities,<sup>1</sup> and (2) programs of the National Flood Insurance Program (NFIP) that provide incentives to reduce flood risks. This report provides information about these federal programs; it is organized into the following sections:

- primer on flood policy and federal flood-related activities;
- descriptions of selected federal assistance programs;
- introduction to flood insurance and related programs; and
- policy considerations.

Although this report covers a broad range of federal programs that may be able to assist with reducing community flood risk and improving resilience, it is not comprehensive. Multiple aspects of flood policy and specialized federal programs are not addressed herein.<sup>2</sup> Although this report is largely an overview of existing federal programs, it also raises various policy considerations as context for these programs and the nation's flood challenge.

In the United States, flood-related responsibilities are shared. States and local governments have significant discretion in land-use and development decisions (e.g., building codes, subdivision ordinances), which can be factors in determining the vulnerability to and consequence of hurricanes, storms, extreme rainfall, and other flood events. Flood events, particularly Hurricane Katrina in 2005 and subsequent events, have generated concern about the nation's and the federal government's financial exposure to flood losses, as well as the economic, social, and public health impacts on individuals and communities.

Congress and other policymakers may be faced with various policy questions related to flood policy, federal programs, and federalism, including the following:

- Are federal programs providing cost-effective assistance to state and local entities to reduce flood risks not only in areas that recently experienced floods, but also other areas at risk of flooding?

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<sup>1</sup> The suite of actions and measures intended to save lives and reduce damage to property from floods generally are considered flood mitigation.

<sup>2</sup> For example, programs specifically targeted at tribes are not presented, and the federal role and activities related to dam safety are not addressed. For more information on dam safety, see CRS In Focus IF10606, *Dam Safety: Federal Programs and Authorities*, by Charles V. Stern et al. Assistance to individuals and businesses, such as loans from the Small Business Administration (SBA) and agricultural conservation programs under USDA, are beyond the scope of this report. For information on SBA, see CRS Report R41309, *The SBA Disaster Loan Program: Overview and Possible Issues for Congress*, by Bruce R. Lindsay. This report does not include information on federal investments in broad-scale monitoring, science, and information dissemination (e.g., hurricane surge warnings) that may assist with flood-risk reduction. A discussion of federal flood-fighting and emergency response also is beyond the scope of this report; for more on the principal federal programs for responding to disasters, such as flood events, see CRS Report R44808, *Federal Disaster Assistance: The National Flood Insurance Program and Other Federal Disaster Assistance Programs Available to Individuals and Households After a Flood*, by Diane P. Horn.

- Could changes to how federal assistance programs or the NFIP are implemented and funded result in long-term net benefits in terms of avoided federal disaster assistance, lives lost, and economic disruption associated with floods?
- Do federal programs provide incentives or disincentives for state and local entities to prepare for floods and manage their flood risks?

## Primer on Flood Policy and Federal Flood-Related Activities

### Evolution of Efforts to Address Flood Risk

Over the decades, U.S. flood policy has evolved from trying to control floodwaters to more comprehensive management of flood risks. Early efforts focused on *flood control* and *flood-damage reduction* using engineered structures such as dams and levees. In the late 20<sup>th</sup> century, the approach shifted to *flood-risk reduction* and *mitigation*, which expanded the measures employed to include buyouts, easements,<sup>3</sup> elevation of structures, evacuation, and other life-saving and damage-reducing actions. More recently, the concept of *flood resilience* has become more prominent.<sup>4</sup> This evolution in part derives from efforts to address the different components that contribute to flood risk. Flood and other types of natural-disaster risk are often expressed as a probabilistic function of

- a hazard, which is the local threat of an event (e.g., probability of a particular community experiencing a storm surge of a specific height);
- vulnerability, which is the pathway that allows a hazard to cause consequences (e.g., level of protection and performance of shore-protection measures); and
- consequences of an event (e.g., loss of life, property damage, economic loss, environmental damage, and social disruption).

For managing flood risks, some stakeholders promote policies to reduce the hazard (e.g., climate change mitigation to reduce sea-level rise). Some stakeholders are interested in reducing vulnerability. These stakeholders may support construction of levees, dams, and shore-protection measures; they also may support protection of natural features that provide flood-management benefits, like coastal wetlands and natural dunes. Some stakeholders support policies to reduce consequences through measures such as development restrictions, building codes, floodproofing of structures, buyouts of vulnerable properties, and improved evacuation routes. Efforts to improve flood resilience often combine trying to reduce consequences, vulnerabilities, and in some cases hazards.

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<sup>3</sup> A flood or floodplain easement is a right granted by a landowner to allow that the land be temporarily inundated.

<sup>4</sup> In 2016, the National Institute of Standards released a Community Resilience Planning Guide to help communities develop plans to improve resilience to natural, technological, and human-caused hazards; it is available at <https://www.nist.gov/topics/community-resilience/community-resilience-planning-guide>.

## Federal Flood-Related Activities

### Flood Control

Although U.S. local, state, and territorial entities and tribes maintain significant flood management responsibilities, the federal role has expanded over the decades in response to catastrophic and regional flood events. Some of the earliest federal involvement was construction of specific flood-control works after significant flood disasters. Examples include construction by the U.S. Army Corps of Engineers (USACE, or Corps) of levees and floodways as part of the Mississippi River and Tributaries (MR&T) project, which Congress authorized in 1928,<sup>5</sup> and drainage structures of the Central and Southern Florida project in and around the Florida Everglades, which Congress authorized in 1948. Since the early 1900s, the federal government has constructed many dams, levees, and other water resource projects to reduce riverine flood damages. Starting in the mid-1950s, the federal government also has participated in many cost-shared coastal flood-risk reduction projects consisting of engineered coastal dunes and beaches, floodwalls, storm surge barriers, and levees.<sup>6</sup> Nonfederal entities (e.g., municipalities, irrigation districts, county flood-control entities) also make their own investments in flood-control infrastructure.<sup>7</sup> Although local governments often preferred structural measures to control flooding (and for their other benefits like recreation at engineered beaches), some stakeholders and groups opposed these measures because of concerns about their environmental impacts. Other interests raised concerns that flood-control structures may encourage development in flood-prone areas, and that the residual risks behind levees and shore protections and downriver from dams were underappreciated.

USACE is the principal federal agency engaged in construction of flood-control measures (e.g., levees and engineered coastal dunes).<sup>8</sup> When appropriations are available, the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture (USDA) has acquired

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<sup>5</sup> Prior to the Lower Mississippi River Flood of 1927, the federal role in flood control was limited. In addition to authorizing USACE to design and construct significant flood-control projects along the Mississippi River (and on the Sacramento River in California), the Flood Control Act of 1928 reiterated the sense of Congress, at the insistence of President Coolidge, that there should be local contribution toward flood-control infrastructure.

<sup>6</sup> For much of this federally constructed infrastructure (except multipurpose dams and ongoing beach nourishment projects), nonfederal entities are the owners and are responsible for most of the operation, maintenance, and regular repair and rehabilitation.

<sup>7</sup> No federal program specifically regulates the design, placement, construction, maintenance, or minimum level of protection for nonfederal flood-control works; however, many such works may require federal permits (e.g., §404 Clean Water Act or §10 River and Harbor Act permits) or otherwise be influenced by federal programs and policies. For example, the assessment of how much protection is provided by flood-control infrastructure for purposes of mapping for the NFIP results in some federal influence over how and where nonfederal entities choose to construct such works. Local governments often have pursued flood-control systems that provide 100-year protection, rather than a significantly higher or lower level of protection, in order to have their community mapped out of the 1%-annual chance floodplain (i.e., the 100-year floodplain) for purposes of the NFIP. Also, some nonfederal public owners of levees, shore protection projects, and certain dams may qualify and participate in a federal program to fund repairs from water, wind, and wave damage known as the Rehabilitation and Inspection Program (RIP); this program has minimum requirements for participation and requires ongoing operations and maintenance of flood-control works. For more information on RIP, see relevant sections of CRS Report R41243, *Army Corps of Engineers: Water Resource Authorizations, Appropriations, and Activities*, by Nicole T. Carter and Charles V. Stern.

<sup>8</sup> Other federal entities operating flood-related infrastructure as part of their primary missions include Bureau of Reclamation in the Department of the Interior, which operates multipurpose water projects in 17 western states; the Tennessee Valley Authority, which has multipurpose dams; the International Boundary and Water Commission, which operates U.S.-Mexico border dams and levees; the Bureau of Indian Affairs; and the four federal land management agencies.



floodplain easements and supported construction of small levees and dams in rural areas. Some flood-control infrastructure owned by local and state entities also has received support from hazard mitigation assistance programs administered by the Federal Emergency Management Agency (FEMA).

### **Insurance, Land Use, and Standards**

In 1968, Congress shifted the federal role in managing flood risks by entering the flood insurance market after private firms had largely abandoned offering flood insurance. Congress established the NFIP in the National Flood Insurance Act of 1968 (NFIA; 42 U.S.C. §4001 et seq.). The new program aimed to alter development in flood-prone areas identified as the 100-year floodplain; this floodplain also is referred to as the 1% annual-chance floodplain, or the floodplain for the Base Flood Elevation (BFE) for purposes of the NFIP.<sup>9</sup> The NFIP's multipronged regulatory system consists of community flood-risk assessment and mapping, purchase requirements for flood insurance for certain residential and commercial structures, and the adoption of minimum local land-use and building-code requirements for vulnerable areas. The NFIP allows for residential and commercial construction in known floodplains, with the proviso that construction must follow building-code regulations that reduce future flood damage and prevent new development from increasing flood risk.

Although the federal government through the NFIP requires that participating communities adopt minimum land-use and building-code regulations, local and state governments maintain the dominant role in adopting building codes (and local governments in their enforcement), including those related to flood risk. A broader federal role in land use and building codes was discussed in the late 1960s. It largely was not adopted with a few exceptions for coastal land use (as discussed in the text box titled "Land-Use Planning and Federal Statutes Related to Coastal Management").

In 1977, President Carter signed Executive Order (E.O.) 11988 (Floodplain Management), which requires that federal actions are to avoid supporting development in the 100-year floodplain if alternatives are available. Also, federal agencies responsible for real property are to design and construct structures and facilities consistent with NFIP regulations. In 2015, President Obama signed E.O. 13690; among other things, the order established a Federal Flood Risk Management Standard (FFRMS) for federally funded projects, which required a higher level of flood resilience than E.O. 11988.<sup>10</sup> On August 15, 2017, President Trump signed E.O. 13807 in an effort to streamline federal infrastructure approval. Among other actions, E.O. 13807 revoked E.O. 13690. By revoking E.O. 13690, E.O. 13807 appears to have eliminated the FFRMS and returned federal floodplain policy to the original text of E.O. 11988.

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<sup>9</sup> FEMA defines the BFE as the water-surface elevation of the base flood, which is the 1%-annual-chance flood. That is, the probability is 1% that rising water will reach the BFE height in any given year.

<sup>10</sup> The FFRMS was first published on January 30, 2015; it was updated and published on October 8, 2015, as Appendix G to the interagency implementing guidance for E.O. 11988 and E.O. 13690, available at [https://www.fema.gov/media-library-data/1445008152304-5118422c7699bbe7ab4a8f06e05cbc36/FINAL-IGAppendicesA-H\\_8Oct15\\_508rev.pdf#page=44](https://www.fema.gov/media-library-data/1445008152304-5118422c7699bbe7ab4a8f06e05cbc36/FINAL-IGAppendicesA-H_8Oct15_508rev.pdf#page=44). E.O. 13690 required that federal agencies apply the FFRMS as a minimum flood-resilience standard for federally funded projects. Federally funded projects were defined as actions where federal funds were used for new construction, substantial improvement, or to address substantial damage to structures and facilities.

### Land-Use Planning Nationally and Federal Statutes Related to Coastal Land Use

Prior to the late 1960s, localities largely administered land-use planning and regulation, with some states having roles in specific issues. After about 1968, that relationship changed as many states assumed more planning responsibilities, mostly for environmental protection. During this period, the federal government and Congress considered a national land-use planning program. Although a national role and program for land-use planning were ultimately rejected, Congress did create a program limited to the nation's coastal zones—the Coastal Zone Management Act of 1972, as amended (CZMA; P.L. 92-532, 16 U.S.C. §1451-1464). Congress later enacted the Coastal Barrier Resources Act of 1982 (CBRA; P.L. 97-348) to address development pressures on undeveloped coastal barriers and adjacent areas.

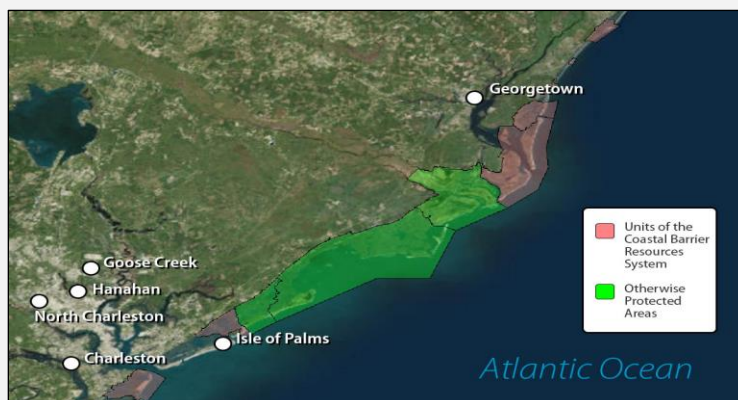
#### Coastal Zone Management Act

Under the CZMA, the National Oceanic and Atmospheric Administration (NOAA) approves coastal zone management programs developed by participating coastal states and U.S. territories and provides limited funding for coastal zone planning and management. The CZMA was enacted to encourage planning to protect natural resources while fostering wise development in the coastal zone. The CZMA recognizes that states (and, in some states, local government) have the lead responsibility for planning and managing their coastal zones. The CZMA authorizes grants to states and territories to develop and implement coastal management programs to address competing development, economic, and recreation pressures. Thirty-four of the 35 eligible states and 5 territories participate in CZMA. CZMA grants can be used for numerous CZMA-defined coastal zone objectives, including managing the effects of sea-level rise and reducing threats to life and property. Participating states and territories have developed widely varying programs that emphasize different elements of coastal management. The state programs are intended to discourage unwise development in flood-prone and exposed areas and to encourage preservation of natural protective features along the coast, including beach systems, coastal barriers, and wetlands. For more on CZMA, see CRS Report RL34339, *Coastal Zone Management: Background and Reauthorization Issues*, by Harold F. Upton.

#### Coastal Barrier Resources Act

The CBRA and subsequent amendments to it have designated undeveloped or relatively undeveloped coastal barriers and adjacent areas. Most federal spending that would support additional development is prohibited in the CBRA system units. The U.S. Fish and Wildlife Service administers CBRA activities. There are 585 of these “system units” encompassing nearly 1.3 million acres of land and associated aquatic areas. The units are along the Gulf of Mexico, the Atlantic Coast, and the Great Lakes and around Puerto Rico and the U.S. Virgin Islands. Each CBRA system unit is identified in law and with a reference to a map. The designation of units and the drawing of boundaries have been contentious for some units. Only Congress can modify the unit boundaries, and it has enacted numerous site-specific amendments. This program does not prohibit or regulate any nonfederal activity; it only prohibits the federal government and federal programs from being used to support additional development within any designated unit. Also, CBRA does not preclude federal expenditures to restore designated units to former levels of development after natural disasters (e.g., reconstruction of roads and water or sewer systems to former dimensions and capacity). In addition to system units, the CBRA system also includes 272 “otherwise protected areas” encompassing 1.9 million acres, which generally coincide with existing conservation or recreation areas, such as state parks and national wildlife refuges. Unlike the broader prohibitions of system units, the only CBRA prohibition in these areas is the prohibition on federal flood insurance. An illustration of system units and otherwise protected areas is provided below.

**Figure 1. Coastal Barrier Resource Designations Near Charleston, SC**



**Source:** Congressional Research Service, using data from U.S. Fish and Wildlife Service.

## Mitigation, and Nonstructural and Green Infrastructure Approaches

After extensive flooding in the Midwest in 1993, federal programs were created or adjusted to increase support for a wider array of activities to reduce damage and prevent loss of life, such as moving flood-prone structures and developing evacuation plans. Nonstructural mitigation is now regularly used as part of the flood management system for new development and when repairing damaged property and communities. Some local, state, and federal agencies and programs allow or support approaches that mimic nature or are “nature-based” (e.g., placement of oyster beds along coastlines to reduce erosion), especially if there are multiple benefits (e.g., erosion reduction and water quality benefits from oyster beds).

Natural flood resilience can be reduced by development that degrades wetlands and ecosystems (e.g., mangroves, coral and oyster reefs) and increases impervious surface in the watershed (e.g., reducing rainfall infiltration into absorbent prairie ecosystems). Department of the Interior agencies (e.g., U.S. Fish and Wildlife Service, National Park Service), NOAA, USACE, and the U.S. Environmental Protection Agency (EPA) are involved in ecosystem restoration and protection activities, as well as permitting and planning activities, that may protect these natural features and their flood-risk-reduction benefits.

Runoff from rainfall in urban areas is often referred to as *stormwater*. For decades local governments and public works officials constructed stormwater infrastructure to move rainwater rapidly away from urban areas. This was done largely through *grey infrastructure* using pipes, gutters, ditches, and storm sewers. Although these systems were able to collect and move water away from developed areas, the stormwater discharged from these systems to surface waters often contained pollutants. In recent years local governments and public works officials have both increasingly expressed interest in and adopted *green infrastructure* for stormwater as a way to manage rainfall to reduce flood losses and to prevent pollution. For stormwater, green infrastructure often consists of using or mimicking natural processes to infiltrate, evapotranspire, or reuse stormwater runoff on-site where it is generated; this helps to reduce or delay runoff that contributes to high water levels in streams and rivers, as well as manage the pollutants entering surface water. Other communities and water users are looking to use green infrastructure to recharge groundwater with urban stormwater and other types of floodwater.

Until recently, the major federal role in stormwater had been EPA regulations to reduce pollution from stormwater runoff pursuant to objectives and requirements in the Clean Water Act.<sup>11</sup> That is, the federal government, if it participated financially in stormwater management, focused on the pollution prevention aspects. As a result of legislative and administrative changes by EPA and states administering the Clean Water State Revolving Fund (CWSRF), activities that “manage, reduce, treat, or recapture stormwater” are now eligible for financial support.<sup>12</sup> Such activities may have flood mitigation as well as pollution prevention benefits.

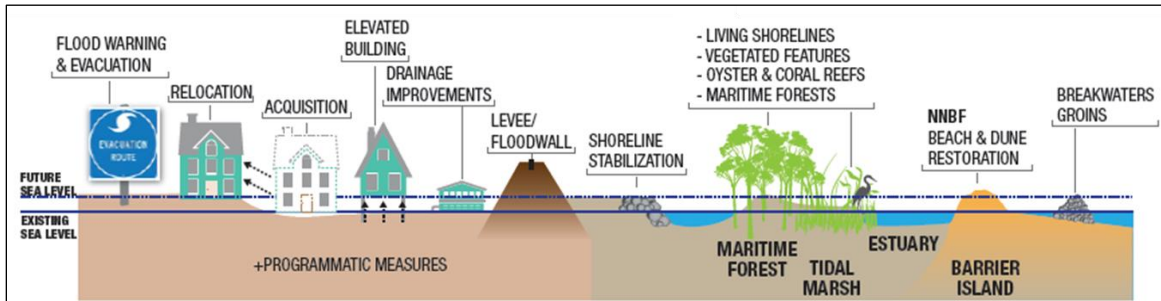
**Figure 2** provides an illustration of the suite of flood-risk reduction and resilience improvements, including both structural and nonstructural measures, for coastal communities and states. A similar suite of options is available for managing flood risks for communities along rivers. A

<sup>11</sup> Stormwater discharges into surface waters are subject to regulation under §402(p) of the Clean Water Act. As the rain that has fallen moves across urban surfaces, it picks up toxic contaminants, oil and grease, organic material, and other substances, which can be directly discharged into streams, thus delivering pollutants into nearby waterways. Or, it can enter the public sewer system through storm drains, and then the water quantity and water quality problems are joined in the water infrastructure system.

<sup>12</sup> See 33 U.S.C. 1383(c), which was amended by the Water Resources Reform and Development Act of 2014 (P.L. 113-121).

flood-risk management response may incorporate multiple types of improvements. For example, **Figure 3** illustrates how levees can be set back from a river to allow for a larger floodplain and how other structural and nonstructural components can be combined to create a more comprehensive flood-risk management system.

**Figure 2. Selected Coastal Flood-Risk Reduction and Resilience Improvements**



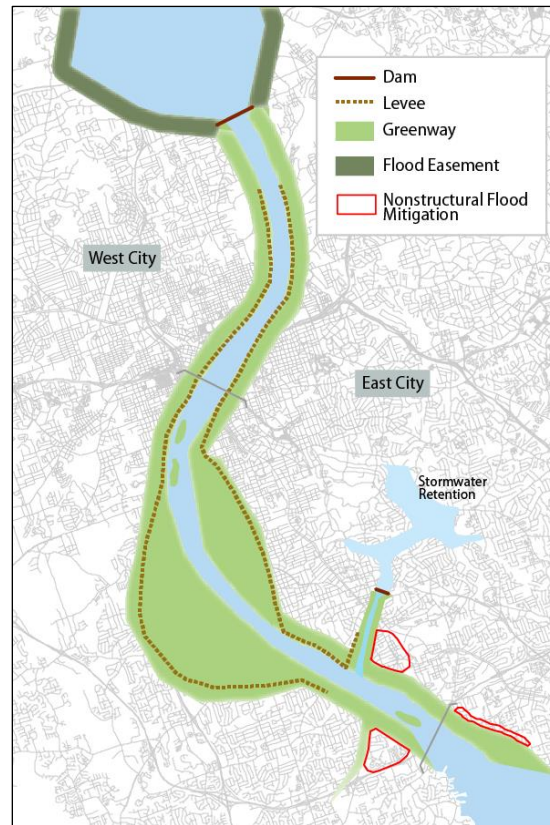
**Source:** U.S. Army Corps of Engineers, *North Atlantic Coast Comprehensive Study: Resilience Adaptation to Increasing Risk*, January 2015, p. 7, [http://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS\\_main\\_report.pdf](http://www.nad.usace.army.mil/Portals/40/docs/NACCS/NACCS_main_report.pdf).

**Note:** Other options to reduce risk also are available, including other forms of zoning and building codes (e.g., floodproofing of lower floors of structures).

## Understanding Risk Through Monitoring, Modeling, and Mapping

The federal government is involved in monitoring and modeling flood risk along with nonfederal and private entities. Federal entities engaged in understanding flood hazards, including flood inundation mapping, include DOI's U.S. Geological Survey (USGS) and NOAA. For example, federal agencies survey coastlines and conduct research to understand coastal processes, hazards, and resources and report on weather-related hazards, including hurricane storm surge warnings.<sup>13</sup> Also, the National Science Foundation supports research on related topics. Advancements in technologies have assisted in better understanding weather and climate, hydrology and hydraulics, and also mapping. Although many types of data are needed to estimate flood risk and produce flood maps, elevation data are fundamental to constructing accurate estimates and maps. Federal agencies along with state, local, and private entities have been using advanced sensing technologies to collect better elevation data for a wide variety of applications, including for maps that can then be used to model and manage flood risk.<sup>14</sup>

**Figure 3. Illustration of Flood-Risk Reduction Measures**



Source: Congressional Research Service.

## Federal Assistance Programs

Congress has created various federal programs that may be able to assist state, local, territorial, and tribal entities with flood-risk reduction and flood-resilience improvements for communities. **Table 1** summarizes some of these federal programs.<sup>15</sup> Each program shown in **Table 1** was created for a specific purpose and has statutory limitations. For example, some programs are triggered only after certain declarations or actions; others are part of regular agency operations. Discussions later in this report provide more information on each of the programs listed in **Table 1**. Although the subsequent discussions examine geographic eligibility generally, some programs may not be eligible in certain areas designated under the Coastal Barrier Resources Act. **Table 1**

<sup>13</sup> For more on federal hurricane research and warnings, see CRS In Focus IF10719, *Forecasting Hurricanes: Role of the National Hurricane Center*, by Peter Folger.

<sup>14</sup> For more information on the initiative to collect elevation data, see <https://nationalmap.gov/3DEP/>.

<sup>15</sup> The discussion of programs and authorities herein is not intended to be comprehensive. For example, it does not include programs targeted at providing for trust species that may have flood mitigation benefits or programs that are targeted at specific types of infrastructure, such as drinking water facilities or transportation infrastructure. This report also does not include programs that have been authorized but have received no appropriations.



provides information on FY2017 available assistance. Available information on FY2018 funding is provided in the more detailed discussions about each program; for many of the programs, the information provided relates to the Administration's budget request for FY2018. As a result of the Continuing Appropriations Act of FY2018 (P.L. 115-56, Division D) providing discretionary appropriations through December 8, 2017, many of the programs that rely on annual discretionary appropriations are likely to be operating through December 8, 2017, at a funding level similar to their FY2017 level of discretionary appropriations.

The first set of assistance programs shown in **Table 1** are those that provide assistance targeted specifically at flood-related improvements. The second set addresses not only flood but also other hazard mitigation and resilience activities. The third set are broader programs that include flood-risk reduction, resilience, or stormwater activities among multiple eligible activities.

**Table 1. Overview of Selected Federal Programs That Support Flood-Risk Reduction and Resilience Improvements**

Program	Agency or Department	Type of Assistance	Trigger	FY2017 Federal Funding <sup>a</sup>
<b>Flood-Specific Programs</b>				
Flood Mitigation Assistance	FEMA	Grant	Annual competition	\$160 million
Flood-Damage Reduction Projects	USACE	Construction	Congressional authorization	\$982 million
Flood-Related Continuing Authorities Programs	USACE	Construction	Program funding	\$14.0 million
Emergency Watershed Protection—Floodplain Easements	USDA	Easement Acquisition	Program funding	\$103 million
<b>Mitigation and Resilience Programs</b>				
Pre-Disaster Mitigation	FEMA	Grant	Annual competition	\$100 million
Hazard Mitigation Grant Program	FEMA	Grant	Major disaster declaration	Unknown, determined per disaster
Watershed and Flood Prevention	USDA	Grant	Annual competition	\$150 million
Coastal Resilience Grants	NOAA	Grant	Annual competition	\$15 million
<b>Multi-Purpose Programs</b>				
Clean Water State Revolving Fund <sup>b</sup>	EPA	Loans and other subsidization	State project selection	\$1.394 billion
Water Infrastructure Finance and Innovation Act Program	EPA	Loans	Annual competition	\$1.5 billion <sup>c</sup>
Community Development Block Grant (CDBG)	HUD	Grant	Formula-based	\$3 billion
CDBG Section 108 Loan Guarantees	HUD	Loan guarantee	Open application linked to CDBG application	\$300 million loan-commitment ceiling
CDBG—Disaster Recovery	HUD	Grant	Supplemental appropriations	Varies

**Source:** Congressional Research Service.

**Notes:** USACE = U.S. Army Corps of Engineers, HUD = U.S. Department of Housing and Urban Development.

- a. Many of these programs provide assistance for multiple natural hazards or multiple categories of eligible activities. Therefore, funding levels are not exclusively provided for flood-only related projects.
- b. This EPA program is implemented by the states. It supports a range of projects and activities, including stormwater infrastructure and stormwater treatment and management. Historically, the majority of this program's funding has supported wastewater infrastructure activities.
- c. EPA documents indicate that the \$25 million in federal appropriations that covers the subsidy costs for loan activities allows the agency to lend approximately \$1.5 billion for a wide range of water infrastructure, including stormwater projects.

In some instances, a state may carry out some activities supported by the programs shown in **Table 1** in a coordinated manner. Each state has a State Hazard Mitigation Officer who helps to compile a state mitigation plan, administers certain mitigation funding, and generally has knowledge of the state's existing mitigation resources and its history of programs and funding awards in this area. Also, a few federal programs allow for funds provided through them to be used to satisfy the nonfederal cost-sharing requirement for another federal program (e.g., see entry for CDBG in **Table 12**).

The below sections discuss the programs shown in **Table 1**; discussions of the programs are grouped by the federal agency or department administering them. The order followed is FEMA, USACE, USDA, NOAA, EPA, and HUD (U.S. Department of Housing and Urban Development).

## Federal Emergency Management Agency<sup>16</sup>

FEMA administers three mitigation grant programs that relate to flood-risk reduction and resilience:

- Pre-Disaster Mitigation (PDM) grant program;
- Hazard Mitigation Grant Program (HMGP); and
- Flood Mitigation Assistance (FMA) program.<sup>17</sup>

HMGP assistance is triggered by a major disaster declaration by the President under the authorities of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act), whereas the PDM program makes awards on an annual basis to states and, in recent years, through a competitive process. The FMA awards also are made on an annual basis and are traditionally funded through the insurance premiums of NFIP policyholders. Collectively, FEMA refers to these programs as its Hazard Mitigation Assistance Grant Programs.<sup>18</sup> **Table 2**, **Table 3**, and **Table 4** include information on PDM, HMGP, and FMA, respectively.<sup>19</sup> FMA is also discussed in "NFIP Flood Mitigation."

<sup>16</sup> This section was prepared by Jared T. Brown, Analyst in Emergency Management and Homeland Security Policy.

<sup>17</sup> See, respectively, §203 and §404 of the Stafford Act for PDM and HMGP (42 U.S.C. §5133 and §5170c) and §1366 of the National Flood Insurance Act for the FMA (42 U.S.C. §4104c). Some mitigation projects may also be funded as part of infrastructure repair grants under §406 of the Stafford Act (42 U.S.C. §5172). See CRS Report R43990, *FEMA's Public Assistance Grant Program: Background and Considerations for Congress*, by Jared T. Brown and Daniel J. Richardson, for additional information.

<sup>18</sup> For summary information on these programs, see Federal Emergency Management Agency, *The Hazard Mitigation Assistance Grant Programs*, at [https://www.fema.gov/media-library-data/1441133724295-0933f57e7ad4618d89debd1ddc6562d3/FEMA\\_HMA\\_Grants\\_4pg\\_2015\\_508.pdf](https://www.fema.gov/media-library-data/1441133724295-0933f57e7ad4618d89debd1ddc6562d3/FEMA_HMA_Grants_4pg_2015_508.pdf).

<sup>19</sup> Research indicates that for every dollar invested by FEMA in flood mitigation between 1993 and 2003, society as a whole saved \$5 due to reduced future flood losses (see Table 6.5 in National Institute of Building Sciences, *Natural* (continued...))

**Table 2. FEMA: Pre-Disaster Mitigation (PDM)**

<b>Purpose</b>	To assist applicants to implement a sustained natural hazard mitigation program prior to disasters. PDM addresses flood and other hazards, including tornadoes, earthquakes, and wildfires.
<b>Eligible Flood-Related Improvements</b>	Eligible projects may include, but are not limited to, property acquisition, structure demolition, floodproofing of structures, structure relocation, structure elevation, mitigation, localized and nonlocalized flood-risk reduction projects.
<b>Type of Federal Assistance</b>	Grants to state agencies, federally recognized tribes, and local governments for mitigation projects as well as mitigation planning.
<b>Federal/Nonfederal Cost-Share</b>	Up to 75% / 25%, or up to 90% / 10% if the applicant or tribal applicant is a small, impoverished community.
<b>Maximum Project Assistance</b>	\$4 million for mitigation projects. \$400,000 for new mitigation plans. \$150,000 for local mitigation plan update. Other conditions apply.
<b>Role of Flood in Program</b>	Historically, program funding concentrated on nonstructural projects such as buyouts of repetitively flooded properties. On June 27, 2014, FEMA issued new policy guidance for eligible projects, including major flood-control projects (dikes, dams, levees, etc.) that previously were ineligible for consideration under PDM.
<b>Program Trigger</b>	Annual appropriations.
<b>Action to Access Program</b>	Grant application process. State emergency management agency or the office that has primary emergency management responsibility applies directly as an applicant.
<b>Geographic Eligibility</b>	Funding is provided to all 50 states, Indian reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	\$100 million for PDM (of which \$10 million is set aside for tribes); PDM is not limited to flood hazards. Provided in annual Homeland Security appropriations. No supplemental appropriations.
<b>FY2018 Funding</b>	Administration budget request is \$39 million.
<b>Authorization</b>	Section 203 of the Stafford Act, 42 U.S.C. §5133.
<b>Website</b>	<a href="https://www.fema.gov/pre-disaster-mitigation-grant-program">https://www.fema.gov/pre-disaster-mitigation-grant-program</a>

**Source:** Congressional Research Service.

(...continued)

*Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities, Volume 2: Study Documentation*, Washington, DC, 2005, p. 137, at [https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/MMC/hms\\_vol2\\_ch1-7.pdf](https://c.ymcdn.com/sites/www.nibs.org/resource/resmgr/MMC/hms_vol2_ch1-7.pdf).



**Table 3. FEMA: Hazard Mitigation Grant Program (HMGP)**

<b>Purpose</b>	To reduce risk to individuals and property while reducing reliance on future federal disaster response and recovery funds.
<b>Eligible Flood-Related Improvements</b>	Eligible projects may include, but are not limited to, property acquisition, structure demolition, floodproofing of structures, structure relocation, structure elevation, mitigation, localized and nonlocalized flood-risk reduction projects.
<b>Type of Federal Assistance</b>	Grants to state agencies, federally recognized tribes, local governments, and certain private nonprofit organizations for mitigation projects as well as mitigation planning.
<b>Federal/Nonfederal Cost-Share</b>	Up to 75% / 25%
<b>Maximum Project Assistance</b>	<p>The total amount of HMGP funding is derived from a formula in law based on the total amount of other grant assistance provided through the Stafford Act (§404(s) of the Stafford Act, 42 U.S.C. §170c). In summary, it is as follows:</p> <ul style="list-style-type: none"> <li>• 15% for amounts not more than \$2 billion;</li> <li>• 10% for amounts of more than \$2 billion and not more than \$10 billion; and</li> <li>• 7.5% on amounts of more than \$10 billion and not more than \$35.333 billion of the estimated aggregate amount of grants to be made (less any associated administrative costs).</li> </ul> <p>States that have an Enhanced State Hazard Mitigation Plan under Section 322(e) of the Stafford Act receive 20% of the total amount.<sup>a</sup></p>
<b>Role of Flood in Program</b>	Historically, program funding concentrated on nonstructural projects such as buyouts of repetitively flooded properties, structurally elevating properties, or limited small flood-control projects. On June 27, 2014, FEMA issued new policy guidance for eligible projects including major flood-control projects (dikes, dams, levees, etc.), which previously were ineligible for consideration under HMGP. <sup>b</sup>
<b>Program Trigger</b>	Triggered by a Stafford Act major disaster declaration by the President.
<b>Action to Access Program</b>	Funds are typically made available statewide in the state that received the declaration, not just in the declared counties.
<b>Geographic Eligibility</b>	Funding is provided to all 50 states, Indian reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	<p>Unknown, determined per disaster. HMGP is one of many activities funded by appropriations to the Disaster Relief Fund.</p> <p>Provided in annual Homeland Security Appropriations or supplemental appropriations.</p>
<b>FY2018 Funding</b>	Not applicable. HMGP is one of many activities funded by appropriations to the Disaster Relief Fund.
<b>Authorization</b>	Section 404 of the Stafford Act, 42 U.S.C. §5170c.
<b>Website</b>	<a href="https://www.fema.gov/hazard-mitigation-grant-program">https://www.fema.gov/hazard-mitigation-grant-program</a>

**Source:** Congressional Research Service.

- a. For a current list of states with enhanced mitigation plans, see FEMA's website at <https://www.fema.gov/hazard-mitigation-plan-status>.
- b. See Federal Emergency Management Agency, *Eligibility of Flood Risk Reduction Measures Under the Hazard Mitigation Assistance Programs*, FP 204-078-112-1, June 27, 2014, at <https://www.fema.gov/media-library/assets/documents/96140>.

**Table 4. FEMA: Flood Mitigation Assistance (FMA)**

<b>Purpose</b>	To mitigate flood-damaged properties in order to reduce or eliminate claims under the NFIP.
<b>Eligible Flood-Related Improvements</b>	Eligible projects may include, but are not limited to, property acquisition, structure demolition, floodproofing of structures, structure relocation, structure elevation, mitigation, localized and nonlocalized flood-risk reduction projects.
<b>Type of Federal Assistance</b>	Grants to state agencies, federally recognized tribes, and local governments for mitigation projects as well as mitigation planning.
<b>Federal/Nonfederal Cost-Share</b>	For NFIP insured properties and planning grants: 75% / 25%.  For repetitive loss property with repetitive loss strategy: 90% / 10%.  For severe repetitive loss property with repetitive loss strategy: 100% / 0%.
<b>Maximum Project Assistance</b>	Various restrictions exist on maximum awards depending on the type of activity funded. <sup>a</sup>
<b>Role of Flood in Program</b>	Program is limited to flood-related mitigation that reduces the risk of properties that repetitively flood and to lessen future insurance claims for the NFIP. <sup>b</sup>
<b>Program Trigger</b>	Annual appropriations. FMA receives funding through an offsetting collection of NFIP premiums in annual appropriation acts.
<b>Action to Access Program</b>	Grant application process.
<b>Geographic Eligibility</b>	Funding is provided to all 50 states, Indian Reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	\$160 million (of the \$175 million authorized through offsetting collections). <sup>b</sup> Provided in annual Homeland Security Appropriations. No supplemental appropriations.
<b>FY2018 Funding</b>	Administration budget request of \$175 million.
<b>Authorization</b>	Section 1366 of the National Flood Insurance Act, 42 U.S.C. §4104c
<b>Website</b>	<a href="https://www.fema.gov/flood-mitigation-assistance-grant-program">https://www.fema.gov/flood-mitigation-assistance-grant-program</a>

**Source:** Congressional Research Service.

- a. For example, by law (42 U.S.C. §4104c(c)(3)), restrictions are placed on the maximum amount that a state or community may receive for updating mitigation plans. For full details, see Federal Emergency Management Agency, *FY2016 Flood Mitigation Assistance (FMA) Grant Program Fact Sheet*, February 15, 2016, at <https://www.fema.gov/media-library/assets/documents/114663>.
- b. For more information, see FEMA, Fact Sheet: FY 2017 Flood Mitigation Assistance (FMA) Grant Program, at [https://www.fema.gov/media-library-data/1499793315357-c31fef3839eae1533d9fccfe5caee71d/FMA\\_FactSheet\\_FY2017\\_508.pdf](https://www.fema.gov/media-library-data/1499793315357-c31fef3839eae1533d9fccfe5caee71d/FMA_FactSheet_FY2017_508.pdf).

## U.S. Army Corps of Engineers<sup>20</sup>

USACE is the primary federal agency involved in construction projects to provide flood-damage reduction; it conducts this work through both project-specific and programmatic authorities.<sup>21</sup>

<sup>20</sup> This section was prepared by Nicole T. Carter, Specialist in Natural Resources Policy.

<sup>21</sup> In 2014, Congress enacted the Water Infrastructure Finance and Innovation Act (WIFIA; 33 U.S.C. §3901, et seq.), which authorized USACE to provide credit assistance to water infrastructure projects, including riverine and coastal flood-damage reduction projects. The Corps WIFIA program remains unfunded and is not addressed in this report.

Most of this work requires that the construction costs be shared with a nonfederal sponsor, such as a municipality or levee district. Generally, federal involvement is limited to projects that are determined to have national benefits exceeding their costs, or that address a public safety concern.<sup>22</sup> The rate of annual federal discretionary appropriations for USACE projects has not kept pace with the rate of authorization for these projects; therefore, there is competition for annual USACE construction funds among multiple types of authorized projects.<sup>23</sup> **Table 5** and **Table 6** include information on USACE flood-risk reduction projects and programs. **Table 5** provides information on projects that require Congress to specifically authorize their construction in legislation. **Figure 4** illustrates how a USACE project may place sand to reduce flood risk by widening the beach and raising the dune; **Figure 5** illustrates the shoreline before and after the USACE project.

For projects of a limited size and scope, Congress has provided USACE with programmatic authorities to participate in planning and construction of some projects without project-specific congressional authorization; these authorities are known as continuing authorities programs (CAPs). **Table 6** provides information on four flood-related CAPs. CAPs are known by the section of the law in which they were first authorized. The four flood-related CAPs discussed are the Section 205 CAP to reduce flood damages, the Section 103 CAP to reduce beach erosion and hurricane storm damage, the Section 14 CAP to protect public works and nonprofit services affected by streambank and shoreline erosion, and the Section 111 CAP to mitigate shore damage from federal navigation projects.

USACE also is authorized to fund the repair of certain nonfederal flood-control works (e.g., levees, dams) and federally constructed hurricane or shore protection projects that are damaged by other than ordinary water, wind, or wave action (e.g., storm surge, rather than high tide). To be eligible for this assistance, damaged flood-control works must be eligible for and active in the agency's Rehabilitation and Inspection Program (RIP) and have been in an acceptable condition at the time of damage, according to regular inspections by USACE. RIP has 1,100 active

**Figure 4. Example of a Beach Engineered to Reduce Flood Damages**

Long Beach Island, NJ



Source: U.S. Army Corps of Engineers, 2013.

<sup>22</sup> Congress established this policy in 1936. The Flood Control Act of 1936 (49 Stat. 1470) states “that the Federal Government should improve or participate in the improvement of navigable waters or their tributaries including watersheds thereof, for flood-control purposes if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people are otherwise adversely affected.”

<sup>23</sup> Since 2005, federal appropriations for USACE flood-damage reduction projects for disaster-affected communities through supplemental appropriations have outpaced annual appropriations for USACE flood-risk reduction infrastructure. For more on supplemental funding of USACE flood-control activities, see CRS Report R42841, *Army Corps Supplemental Appropriations: Recent History, Trends, and Policy Issues*, by Charles V. Stern and Nicole T. Carter.

nonfederal flood risk management systems participating.<sup>24</sup> The program does not fund repairs associated with regular operations and maintenance. For more information on RIP repair assistance, see the relevant sections of CRS Report R41243, *Army Corps of Engineers: Water Resource Authorizations, Appropriations, and Activities*, by Nicole T. Carter and Charles V. Stern.

**Figure 5. Example of Beach Engineered to Reduce Flood Damages**

Ocean City, NJ, Before and After Engineered Beach Project



Source: U.S. Army Corps of Engineers, 2012 and 2013.

**Table 5. USACE: Authorized Flood-Damage Reduction Projects**

<b>Purpose</b>	Improvements that reduce riverine and coastal storm damages. These improvements are pursued as individual projects rather than under an authorized national program.
<b>Eligible Flood-Related Improvements</b>	Flood-damage reduction works, typically engineered works (e.g., levees, engineered dunes and beaches, storm surge gates and dams). Projects generally are required to have national benefits exceeding costs, or address public safety concerns.
<b>Type of Federal Assistance</b>	Corps study and construction of cost-shared project, or credit or reimbursement for federal portion of nonfederal-led study and construction project. <sup>a</sup>
<b>Federal/Nonfederal Cost-Share</b>	Study: 50% / 50% Construction: 65% / 35% Coastal Periodic Nourishment: 50% / 50% <sup>b</sup> Operations & Maintenance (O&M): 0% / 100% for most projects (some legacy projects and dams have Corps O&M) Territories and tribes have the first \$455,000 in costs associated with studies and construction activities waived pursuant to 33 U.S.C. §2310.
<b>Maximum Project Assistance</b>	Amount depends on project-specific authorization of appropriations.

<sup>24</sup> Email from USACE staff, March 1, 2017. The owner of the flood control system must be a legally constituted public body to be allowed to participate in RIP.

<b>Role of Flood in Program</b>	Projects are generally limited to those that reduce riverine and coastal flood damage; projects generally do not address drainage within a community or flooding from groundwater.
<b>Program Trigger</b>	Project-specific congressional authorization and appropriations.
<b>Action to Access Program</b>	Public proposals for studies or construction can be submitted to the USACE for review and inclusion in an annual report to Congress. Before a study or construction project is eligible for federal participation and funding, it must be authorized by Congress. Once authorized, funding for projects is identified in reports accompanying enacted appropriations bills or USACE work plans for the fiscal year. There is a backlog of authorized projects waiting for federal funds.
<b>Geographic Eligibility</b>	Project-specific congressional authorization determines the geographic scope of the project. USACE has participated in projects in all states, some Indian Reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	<p>\$982 million for flood-related study and construction (\$131 million for coastal projects, \$851 million for riverine projects).<sup>c</sup></p> <p>Provided in annual Energy &amp; Water Development Appropriations.</p> <p>No supplemental appropriations.</p>
<b>FY2018 Funding</b>	Administration budget request of \$553 million for flood-related study and construction (\$23 million for coastal projects, \$530 million for riverine projects).
<b>Authorization</b>	Construction of individual projects is authorized by Congress, typically in a Water Resources Development Act.
<b>Websites</b>	<p><a href="http://www.usace.army.mil/Missions/Civil-Works/Project-Planning/WRRDA-7001-Proposals/">http://www.usace.army.mil/Missions/Civil-Works/Project-Planning/WRRDA-7001-Proposals/</a></p> <p><a href="http://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/">http://www.iwr.usace.army.mil/Missions/Flood-Risk-Management/Flood-Risk-Management-Program/</a></p>

**Source:** Congressional Research Service.

- a. For the most part, congressionally authorized Corps flood-damage reduction projects have been constructed by the agency (with a nonfederal cost-share). After construction, the projects are turned over to nonfederal sponsors to own, operate, maintain, repair, and rehabilitate. In recent years, some nonfederal sponsors have used authorities to construct projects themselves and seek reimbursement or credit from the Corps.
- b. For beach and dune nourishment elements of coastal storm damage reduction projects, the construction is often authorized to include regular renourishments (i.e., sand replenishment) over 50 years (with processes to seek extensions).
- c. Amount does not include \$750 million in Corps flood-related O&M spending; much of this is for existing projects that the Corps owns and operates.

**Table 6. USACE: Flood-Related Continuing Authorities Programs**

<b>Purpose</b>	<p>Under authorized Continuing Authorities Programs (CAPs), USACE may study and construct certain improvements without additional project-specific congressional authorization. CAPs are known by the section number of the law in which they were authorized. The four flood-related CAPs are for projects that</p> <ul style="list-style-type: none"> <li>• (§205) reduce flood damages (using structural and nonstructural approaches);</li> <li>• (§103) reduce beach erosion and hurricane storm damage;</li> <li>• (§14) protect public works and nonprofit services affected by streambank and shoreline erosion; or</li> <li>• (§111) mitigate shore damage from federal navigation projects.</li> </ul>
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<b>Eligible Flood-Related Improvements</b>	<p>Flood-damage reduction works, often engineered infrastructure, that fall within the authority of the specific CAP, subject to the availability of appropriations.</p> <p>Projects generally are required to have national benefits exceeding costs, or address public safety concerns, as well as be technically feasible and comply with federal environmental and resource statutes.</p>
<b>Type of Federal Assistance</b>	(§205, §103, §14, and §111) Corps study and construction of cost-shared projects.
<b>Federal/Nonfederal Cost-Share</b>	<p>Study:</p> <ul style="list-style-type: none"><li>• (§205, §103 and §14) 50% / 50% after first \$0.1 million, which is 100% federal.</li><li>• (§111) Study and Construction: Same as the federal project causing the damage.</li></ul> <p>Construction:</p> <ul style="list-style-type: none"><li>• (§205, §103 and §14) 65% / 35%.</li><li>• (§111) Same as the federal project causing the damage</li></ul> <p>Operations &amp; Maintenance:</p> <ul style="list-style-type: none"><li>• (§205, §103, §14, and §111) 0% / 100%.</li><li>• Territories and tribes have the first \$0.455 million in costs associated with these activities waived pursuant to 33 U.S.C. §2310.</li></ul>
<b>Maximum Project Assistance</b>	<p>Federal assistance for a project cannot exceed the following:</p> <ul style="list-style-type: none"><li>• (§205) \$10 million;</li><li>• (§103) \$10 million;</li><li>• (§14) \$5 million; and</li><li>• (§111) \$10 million.</li></ul>
<b>Role of Flood in Program</b>	<p>Projects are limited to improvements that</p> <ul style="list-style-type: none"><li>• (§205) reduce flood damages (including from ice jams, not including drainage from within a community);</li><li>• (§103) reduce beach erosion and hurricane storm damage (not including drainage from within a community);</li><li>• (§14) protect public works and nonprofit services affected by streambank and shoreline erosion (not including protection for most private property); or</li><li>• (§111) mitigate shore damage directly attributable to a federal navigation project.</li></ul>
<b>Program Trigger</b>	Annual appropriations.
<b>Action to Access Program</b>	State, tribal, or local government agency may submit to the local USACE district a written request for work under a CAP authority through the local USACE district in which the activity would be located. USACE identifies and selects eligible projects for funding using enacted appropriations for the CAP program. Demand for CAP projects often exceeds federal funds.
<b>Geographic Eligibility</b>	<p>Section 205 is open to all of the United States and Indian Reservations and has been interpreted as being open to territorial possessions.</p> <p>Section 103 is open to activities associated with the shores and beaches of the United States, Indian reservations, its territories, and its possessions.</p> <p>Section 14 is open to all of the United States and Indian Reservations and has been interpreted as being open to territorial possessions.</p> <p>Section 111 is open to all of the United States and Indian Reservations and has been interpreted as being open to territorial possessions.</p>



<b>FY2017 Funding</b>	(§205) \$8.0 million. (§103) \$0.5 million. (§14) \$5.0 million. (§111) \$0.5 million. Provided in annual Energy and Water Development Appropriations. No supplemental appropriations.
<b>FY2018 Funding</b>	Administration budget request for Section 205 was \$1.0 million. No funding was requested by the Administration for Section 103, Section 14, or Section 111.
<b>Authorization</b>	(§205) 33 U.S.C. §701s. (§103) 33 U.S.C. §426g. (§14) 33 U.S.C. §701r. (§111) 33 U.S.C. §426i.
<b>Website</b>	No national USACE CAP website; to identify USACE district, use <a href="http://www.usace.army.mil/Locations/">http://www.usace.army.mil/Locations/</a>

Source: Congressional Research Service.

## U.S. Department of Agriculture<sup>25</sup>

Similar to the USACE, USDA's role in flood control and risk-reduction was established by Congress decades ago.<sup>26</sup> The general difference between the two agencies is the size, scope, location, and authorization of projects. USDA's Natural Resources Conservation Service (NRCS) administers two programs that provide flood-damage reduction—the Watershed and Flood Prevention Operations (WFPO) program and the floodplain easement program of the Emergency Watershed Protection (EWP) program.<sup>27</sup> These programs provide assistance to states, tribes, and local organizations; projects generally originate at the local level and do not require congressional approval. Annual appropriations vary greatly from year to year, resulting in a number of authorized, but unfunded projects. **Table 7** and **Table 8** include information on USDA flood-risk reduction and mitigation programs. **Figure 6** provides an example of the acquisition of a floodplain easement.

<sup>25</sup> This section was prepared by Megan Stubbs, Specialist in Agricultural Conservation and Natural Resources Policy.

<sup>26</sup> The Flood Control Act of 1936 (P.L. 74-738) authorized USDA to examine and survey measures of controlling runoff, soil erosion, and water flow in watersheds upstream from the rivers and tributaries under the jurisdiction of the Corps. This broad authority was expanded in the Flood Control Act of 1944 (P.L. 78-534), and again in the Watershed Protection and Flood Prevention Act of 1954 (P.L. 83-566), which provided authority and funding for structural practices. Congress intended for USDA to conduct smaller flood-control works upstream of larger Corps projects as an extension of its current on-farm conservation work. For additional information, see CRS Report RL30478, *Federally Supported Water Supply and Wastewater Treatment Programs*, coordinated by Jonathan L. Ramseur.

<sup>27</sup> EWP is an emergency recovery program that provides financial and technical assistance to project sponsors following a natural disaster. Congress amended the program in 1996 (§382, P.L. 104-127) to include the purchase of floodplain easements “in lieu of recovery.” Since then, NRCS has enrolled over 1,500 easements on close to 185,000 acres. For additional information, see CRS Report R42854, *Emergency Assistance for Agricultural Land Rehabilitation*, by Megan Stubbs. NRCS also administers a number of agricultural conservation programs that provided technical and financial assistance to individual producers for the implementation of conservation measures. These measures can include flood-risk reduction and erosion strategies. Since these programs are administered directly to individuals and not state or local entities, they are not included in this report. For additional information on these programs, see CRS Report R40763, *Agricultural Conservation: A Guide to Programs*, by Megan Stubbs.

**Figure 6. Example of a Floodplain Easement**  
Arkansas and Petite Jean River Floodplains, AR



Source: Natural Resources Conservation Service.

**Table 7. NRCS: Watershed and Flood Prevention Operations (WFPO)**

<b>Purpose</b>	WFPO provides technical and financial assistance to states, tribes, and local organizations to plan and install watershed projects.
<b>Eligible Flood-Related Improvements</b>	Eligible projects include land treatment, and nonstructural and structural facilities for flood prevention and erosion reduction. Structural measures can include dams, levees, canals, and pumping stations.
<b>Type of Federal Assistance</b>	Partial project grants, plus provision of technical advisory services.
<b>Federal/Nonfederal Cost-Share</b>	The federal government pays all costs related to construction for flood-control purposes only. Costs for nonagricultural water supply must be repaid by local organizations; however, up to 50% of costs for land, easements, and rights-of-way allocated to public fish and wildlife and recreational developments may be paid with program funds. Local sponsors agree to operate and maintain completed projects.
<b>Maximum Project Assistance</b>	No project may exceed 250,000 acres, and no structure may exceed more than 12,500 acre-feet of floodwater detention capacity, or 25,000 acre-feet of total capacity without congressional approval. Congressional approval is also required when a project includes an estimated federal contribution of more than \$5 million for construction or includes a storage structure with a capacity in excess of 2,500 acre-feet. There are no population or community income-level limits on applications for WFPO.
<b>Role of Flood in Program</b>	WFPO originally required flood prevention and protection as a function of all projects. The program has since been amended to include other water quality and water resources purposes. <sup>a</sup>
<b>Program Trigger</b>	Program appropriations in enacted legislation.



<b>Action to Access Program</b>	Authorization of approved watershed plans can be (1) requested from sponsoring organizations; (2) congressionally directed; or (3) authorized by the Chief of NRCS. After approval, technical and financial assistance can be provided for installation of works of improvement specified in the plans, subject to annual appropriations.
<b>Geographic Eligibility</b>	Projects in all 50 states, Indian Reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	\$150 million; not limited to flood prevention. Provided in annual Agricultural and Related Agencies Appropriations. No supplemental appropriations.
<b>FY2018 Funding</b>	No funding was requested by the Administration.
<b>Authorization</b>	The program consists of projects built under two authorities—the Watershed Prevention and Flood Protection Act of 1954 (P.L. 83-566) and the Flood Control Act of 1944 (P.L. 78-534). 33 U.S.C. 701b-1, and 16 U.S.C. 1001-1008.
<b>Website</b>	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/wfpo/">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/landscape/wfpo/</a>

**Source:** Congressional Research Service.

- a. Other improvements can include agricultural water management, public recreation development, fish and wildlife habitat development, and municipal or industrial water supplies.

**Table 8. NRCS: Emergency Watershed Protection (EWP)—Floodplain Easements**

<b>Purpose</b>	Separate from the general EWP program, floodplain easements are meant to safeguard lives and property from future floods, drought, and the products of erosion through the restoration and preservation of the land's natural values.
<b>Eligible Flood-Related Improvements</b>	NRCS has authority to restore and enhance floodplain function and values. This includes removing all structures, including buildings, within easement boundaries.
<b>Type of Federal Assistance</b>	Floodplain easements are voluntarily purchased and held by NRCS in perpetuity when in agricultural areas. In areas with residential properties, local project sponsors are required to acquire the underlying land, in fee title, after the easement closes. USDA also provides technical assistance and restoration costs.
<b>Federal/Nonfederal Cost-Share</b>	The federal government can provide up to 100% of restoration costs and up to 75% of building removal costs. Federal easement payments are limited to the lowest amount identified using the three valuation methods described below under "Maximum Project Assistance."
<b>Maximum Project Assistance</b>	Landowners receive the smallest of the following values as an easement payment: (1) a geographic area rate established by the NRCS; (2) the fair-market value based on an area-wide market analysis or an appraisal completed according to the Uniform Standards of Professional Appraisal Practices; or (3) the landowner's offer.
<b>Role of Flood in Program</b>	Land must be within an eligible floodplain.
<b>Program Trigger</b>	Program appropriations in enacted legislation.
<b>Action to Access Program</b>	Eligible lands include (1) floodplain lands damaged by flooding at least once in the previous calendar year or damaged by flooding at least twice within the previous 10 years; (2) other lands within the floodplain that would contribute to the restoration of the flood storage and flow or erosion control, or would improve the practical management of the easement; or (3) lands that would be inundated or adversely affected as a result of a dam breach.
<b>Geographic Eligibility</b>	Projects in all 50 states, Indian Reservations, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.

<b>FY2017 Funding</b>	<p>Provided as a subset of the general EWP program, which is funded on an ad hoc basis.</p> <p>The general EWP program received \$103 million in FY2017 (P.L. 114-254, Division A, §185), with an unknown subset for floodplain easements.</p> <p>H.Rept. 114-531 included language supporting NRCS's efforts with the "voluntary floodplain homeowner buyout projects."</p> <p>No supplemental appropriations.</p>
<b>FY2018 Funding</b>	Not part of annual budget requests or appropriations.
<b>Authorization</b>	33 U.S.C. 701b-1 and 16 U.S.C. 2203-2205.
<b>Website</b>	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/ewp/">https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/ewp/</a>

**Source:** Congressional Research Service.

## National Oceanic and Atmospheric Administration<sup>28</sup>

NOAA conducts a broad variety of activities that support coastal resilience, including scientific research, data collection and monitoring, planning, habitat conservation and restoration, and coastal and ocean management. Most of NOAA's efforts focus on management, planning, and technical assistance; some of these programs lead to improved coastal flood resilience.

The NOAA program most directly related to coastal flood resilience is the Coastal Resilience Grant program, which funds activities for strengthening coastal communities and habitat restoration (see **Table 9**). An example of a project conducted through this program is shown in **Figure 7**. In this case, NOAA provided financial assistance for a collaborative effort to monitor, evaluate, and provide recommendations for the design and placement of nature-based shoreline protection. The project shown in **Figure 7** is being monitored to document the impact that concrete reef balls have on protecting restored marshes and reducing erosion from wave energy at the nearby shoreline.

In addition to the Coastal Resilience Grant program, NOAA works with states on coastal flood risk reduction and resilience through implementation of planning and other activities pursuant to the Coastal Zone Management Act of 1972, as amended (CZMA; P.L. 92-532, 16 U.S.C. §§1451-1464). For more on NOAA's CZMA activities and the U.S. Fish and Wildlife Service's activities pursuant to the Coastal Barrier Resources Act of 1982, as amended (CBRA; P.L. 97-348), see the earlier text box titled "Land-Use Planning and Federal Statutes Related to Coastal Management."

<sup>28</sup> This section was prepared by Harold F. Upton, Analyst in Natural Resources Policy.

**Figure 7. Example of a NOAA-Assisted Coastal Resilience Grant Project**  
Reef Balls at Stafford Point, CT



**Source:** Jennifer Mattei, Sacred Heart University (with permission), <https://circa.uconn.edu/2017/07/18/circa-receives-2017-noaa-coastal-resilience-grant-to-evaluate-living-shorelines-to-reduce-flood-risk/>.

**Note:** The concrete reef balls are intended to reduce erosion from wave energy at the nearby shoreline.

**Table 9. NOAA: Coastal Resilience Grants**

<b>Purpose</b>	<p>(1) Strengthening Coastal Communities: Improve capacity of coastal jurisdictions to plan and prepare for, absorb impacts of, recover from, and adapt to extreme weather events and climate-related hazards.</p> <p>(2) Habitat Restoration: Restore habitat to strengthen the resilience of coastal ecosystems and decrease vulnerability of coastal communities to extreme weather events and climate-related hazards.</p>
<b>Eligible Flood-Related Improvements</b>	<p>(1) Strengthening Coastal Communities: data acquisition, tool development, risk communication and outreach, education and training, technical assistance, plan development, and implementation.</p> <p>(2) Habitat Restoration: Restore degraded or altered marine, estuarine, coastal, and riverine areas.</p>
<b>Type of Federal Assistance</b>	Competitive grants with a cost-share requirement. Funded through cooperative agreements requiring substantial involvement of NOAA.
<b>Federal/Nonfederal Cost-Share</b>	Federal funds must be matched with nonfederal contributions at a 2:1 ratio.
<b>Maximum Project Assistance</b>	Maximum of \$2 million per grant.
<b>Role of Flood in Program</b>	<p>Funding for strengthening coastal communities may include on-the-ground components (e.g., living shorelines) but should also include transfer of knowledge for future use.</p> <p>Funding of habitat projects involves on-the-ground habitat restoration that results in physical habitat modifications and more resilient coastal ecosystems.</p>
<b>Program Trigger</b>	Annual appropriations, and subsequent public announcement of federal funding opportunity.
<b>Action to Access Program</b>	Proposal from an eligible entity such as regional organizations, institutions of higher education, U.S. territories, states, tribes, and local governments.
<b>Geographic Eligibility</b>	Projects in U.S. coastal states, coastal Indian Reservations, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands. Applicants in the District of Columbia may submit applications only for the habitat restoration category.
<b>FY2017 Funding</b>	<p>Available for grants: \$15 million.</p> <p>Provided in annual Commerce, Justice, and Science Appropriations.</p> <p>No supplemental appropriations.</p>

<b>FY2018 Funding</b>	No funding was requested by the Administration for the program.
<b>Authorization</b>	Coastal Zone Management Act (16 U.S.C. §1456); Fish and Wildlife Coordination Act (16 U.S.C. §661); Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. §1891a); Endangered Species Act (16 U.S.C. §1535).
<b>Website</b>	<a href="https://www.coast.noaa.gov/resilience-grant/">https://www.coast.noaa.gov/resilience-grant/</a>

**Source:** Congressional Research Service.

## Environmental Protection Agency<sup>29</sup>

EPA's principal role in stormwater management is regulatory, consisting primarily of a discharge permit program. Although the EPA's financial role in flood-risk reduction historically has been very limited, it has expanded in recent years, with attention to how green infrastructure approaches to stormwater management can improve water quality. EPA may provide support for stormwater projects that contribute to pollution prevention through reduction of contaminants and erosion, including by managing runoff.

To date, the primary avenue for this EPA assistance has been through the clean water State Revolving Fund (SRF) program (**Table 10**). Each state implements its own SRF program, which is allowed to support a range of projects and activities; this results in variations in program implementation from state to state. Historically, the vast majority of the projects supported by the SRF have been wastewater infrastructure activities, some of which may have involved stormwater infrastructure. Pursuant to changes made in 2014 (P.L. 113-121), stormwater management became one of multiple eligible categories of activities for SRF loans and other assistance. However, the selection of SRF projects for assistance remains prioritized on meeting the pollution-prevention objectives of the Clean Water Act.<sup>30</sup>

EPA's Water Infrastructure Finance and Innovation Act of 2014 (WIFIA) program also may provide a source of financial assistance for water infrastructure, which may include stormwater-related activities. As described in **Table 11**, P.L. 113-121 (Title V, Subtitle C) established the WIFIA program; it authorized EPA to provide credit assistance (e.g., secured/direct loans or loan guarantees) for a range of wastewater and drinking water projects.<sup>31</sup> In general, project costs must be \$20 million or larger to be eligible for WIFIA credit assistance, and WIFIA loan assistance is generally limited to 49% of eligible costs.<sup>32</sup> EPA expects to issue its first WIFIA loans in 2017.

<sup>29</sup> This section was prepared by Jonathan L. Ramseur, Specialist in Environmental Policy.

<sup>30</sup> All funds in the clean water SRF resulting from federal capitalization grants are first to be used to assure maintenance of progress toward compliance with enforceable deadlines, goals, and requirements of the Clean Water Act (33 U.S.C. §1382(b)(5)).

<sup>31</sup> For more information, see CRS Report R43315, *Water Infrastructure Financing: The Water Infrastructure Finance and Innovation Act (WIFIA) Program*, by Jonathan L. Ramseur and Mary Tiemann.

<sup>32</sup> In rural areas (defined as populations of 25,000 or less), project costs must be \$5 million or more.

**Table 10. EPA: Clean Water State Revolving Fund**

<b>Purpose</b>	Program provides financial assistance through state-administered clean water SRF programs, supporting wastewater infrastructure and other eligible projects and activities. States must use SRF monies first to ensure compliance with Clean Water Act deadlines, goals, and requirements.
<b>Eligible Flood-Related Improvements</b>	The assistance can be used for constructing publicly owned facilities for stormwater management and for measures that would reduce stormwater (e.g., green infrastructure).
<b>Type of Federal Assistance</b>	Clean water SRFs may provide seven general types of financial assistance: making loans; buying or refinancing existing local debt obligations; guaranteeing or purchasing insurance for local debt obligations; guaranteeing SRF debt obligations (i.e., to be used as security for leveraging the assets in the SRF); providing loan guarantees for substate revolving funds; earning interest on fund accounts; and supporting reasonable costs of administering the SRF.
<b>Federal/Nonfederal Cost-Share</b>	Most assistance is for loans that have to be 100% repaid to the state clean water SRF.
<b>Maximum Project Assistance</b>	Not specified.
<b>Role of Flood in Program</b>	Eligible projects include measures to manage, reduce, treat, or recapture stormwater, including those that may provide flood-risk reduction and resilience benefits.
<b>Program Trigger</b>	Annual project selection at state level.
<b>Action to Access Program</b>	Eligible entities submit applications to state-administered programs. In general, eligible loan recipients for SRF assistance include municipalities and intermunicipal, interstate, or state agencies. Private utilities are not eligible to receive funds for construction of wastewater treatment works and most other eligible activities, but privately owned projects are eligible for certain types of activities (e.g., projects to manage, reduce, or treat stormwater; or development of watershed management projects).
<b>Geographic Eligibility</b>	SRF programs operate in all 50 states and Puerto Rico.  Through a separate process, EPA provides direct grants for the District of Columbia, U.S. Virgin Islands, American Samoa, Guam, and the Commonwealth of Northern Marianas.  EPA also provides direct grants to Indian tribes (33 U.S.C. §1377). The funding for the District of Columbia, U.S. territories, and Indian tribes is part of the SRF appropriation to EPA.
<b>FY2017 Funding</b>	\$1.394 billion to EPA, which awarded grants to states to capitalize loan funds; states are to provide a 20% match for those funds. Federal funds are distributed by formula to the state SRF programs.  Provided in annual Interior, Environment, and Related Agencies Appropriations.
<b>FY2018 Funding</b>	Administration budget request was for \$1.394 billion.
<b>Authorization</b>	Clean Water Act, as amended, Sections 601-607, 33 U.S.C. §§1381-1387. Regulations are codified at 40 C.F.R. §35.3100.
<b>Website</b>	<a href="https://www.epa.gov/cwsrf">https://www.epa.gov/cwsrf</a>

**Source:** Congressional Research Service.

**Table 11. EPA: Water Infrastructure Finance and Innovation Act (WIFIA)**

<b>Purpose</b>	Help finance water infrastructure projects, including projects to build and upgrade wastewater and drinking water treatment systems. WIFIA provides credit assistance to large water projects that may otherwise have difficulty obtaining financing.
<b>Eligible Flood-Related Improvements</b>	Eligible projects include (among others) all categories eligible for SRF assistance, including measures to manage, reduce, treat, or recapture stormwater, which may provide flood-risk reduction and resilience benefits.
<b>Type of Federal Assistance</b>	Credit assistance (e.g., loans or loan guarantees).
<b>Federal/Nonfederal Cost-Share</b>	No cost share requirement, but federal share subject to limitations.
<b>Maximum Project Assistance</b>	No maximum cost per project, but loan amounts limited to 49% of eligible project costs; total amount of federal assistance (i.e., WIFIA and other federal sources) may not exceed 80% of total project costs.
<b>Role of Flood in Program</b>	Eligible projects include “measures to manage, reduce, treat, or recapture stormwater,” which may provide flood-risk reduction and resilience benefits.
<b>Program Trigger</b>	Credit assistance awarded by EPA on competitive basis.
<b>Action to Access Program</b>	Eligible entities submit credit assistance application to EPA. Eligible entities include a corporation; partnership; joint venture; trust; or a federal, state, local, or tribal government (or consortium of tribal governments).
<b>Geographic Eligibility</b>	Projects in all 50 states, the District of Columbia, Indian lands, and U.S. territories.
<b>FY2017 Funding</b>	\$25 million in loan subsidy costs, which allows EPA to lend approximately \$1.5 billion; program is not limited to stormwater.
<b>FY2018 Funding</b>	Administration budget request was \$29 million to cover subsidy costs, which would allow EPA to lend approximately \$1.9 billion.
<b>Authorization</b>	Water Resources Reform and Development Act of 2014, Title V, codified in 33 U.S.C. §§3901-3914. Regulations are codified at 40 C.F.R. §35.10000.
<b>Website</b>	<a href="https://www.epa.gov/wifia">https://www.epa.gov/wifia</a>

**Source:** Congressional Research Service.

## Department of Housing and Urban Development<sup>33</sup>

Other federal departments and agencies may provide support for flood-risk reduction and resilience through broad programs. Primary examples of this are certain HUD-administered programs. Under HUD’s Community Development Block Grants (CDBG) program, public works is 1 of 27 eligible categories of activities; flood-resilience improvements may qualify as public works under CDBG, as shown in **Table 12**. Other eligible activities that may qualify for CDBG assistance that benefit state and local flood resilience are buyouts of damaged properties in a floodplain and relocating residents to safer areas. Due to the block grant nature of the program, local and state officials exercise a great deal of discretion in determining which combination of eligible activities to employ. **Table 13** provides information on the loan guarantee program of the CDBG.

Unlike CDBG, the CDBG-Disaster Recovery (CDBG-DR) program is not an annually funded HUD program. Instead, it has been funded at times through supplemental appropriations

<sup>33</sup> This section was prepared by Eugene Boyd, Analyst in Federalism and Economic Development Policy.



legislation and is tied to a specific disaster (and affected areas) or set of disasters.<sup>34</sup> The CDBG-DR program is designed to help communities and neighborhoods that otherwise might not recover after a disaster due to limited resources. Eligible grantees typically include states, units of local government, and Indian tribes.

Congress has appropriated roughly \$45 billion since FY1999 in supplemental funds for CDBG-DR to support disaster relief, mitigation, and recovery activities. As a result, the program has become one of the federal government's principal instruments in support of long-term economic recovery following both man-made and natural disasters, such as floods. Often, CDBG-DR grantees must use at least 70% of the funds for activities that principally benefit low- and moderate-income (LMI) persons or areas. **Table 14** provides information on the CDBG-DR program for major disasters occurring in FY2017; the table reflects the program and its appropriations as of October 2017.

**Table 12. HUD: Community Development Block Grant (CDBG)**

<b>Purpose</b>	Program funds must be used to address one of three national objectives that either (1) principally benefit low- or moderate-income persons, (2) aid in eliminating or preventing slums or blight, or (3) address an imminent threat to the health or safety of residents.
<b>Eligible Flood-Related Improvements</b>	The block grant nature of the program allows state and local government grant recipients to undertake any of 27 categories of eligible activities, including open-space acquisition, construction, repair, replacement, or relocation of public facilities, and improvements such as dams and levees.
<b>Type of Federal Assistance</b>	Formula-based block grants with 30% of appropriated funds allocated to states and Puerto Rico for distribution to small communities; and 70% of appropriated funds allocated to metropolitan-based cities with populations of 50,000 or more, and urban counties with populations of 200,000 or more. Funds are also allocated under a separate formula to the insular areas of American Samoa, Guam, Northern Marianas, and Virgin Islands. Indian tribes may compete for funds under a separate competitively awarded CDBG for Indian tribes.
<b>Federal/Nonfederal Cost-Share</b>	No matching funds required. Program funds may be used to meet the nonfederal matching fund requirement of other federal grant programs.
<b>Maximum Project Assistance</b>	Not specified. Grantees may use CDBG directly to fund mitigation activities such as buyouts. Grantees also may use annual CDBG grants to access the CDBG Section 108 loan guarantee program, which allows a grantee to borrow up to five times its annual allocation for large-scale economic development, public facilities, or housing projects (see <b>Table 13</b> ). Flood risk reduction and resilience activities may be part of such projects.
<b>Role of Flood in Program</b>	Limited percentage of total annual CDBG funds supports flood-risk reduction and resilience. For example, in FY2016, HUD reported \$21.4 million was expended on flood and drainage facilities.  CDBG funds may be used for any of 27 eligible activities at the discretion of the grantee, including land-use planning, open-space acquisition, hazard mitigation, and other public works and public improvement activities that address one of three national objectives.
<b>Program Trigger</b>	Annual appropriations. Formula-based grant.
<b>Action to Access Program</b>	CDBG grantees must develop and submit to HUD annual and multiyear plans outlining the proposed use of funds.

<sup>34</sup> For more information, see CRS Report R43520, *Community Development Block Grants and Related Programs: A Primer*, by Eugene Boyd.

<b>Geographic Eligibility</b>	Projects in all 50 states, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.
<b>FY2017 Funding</b>	\$3.0 billion awarded to states and local governments for all eligible activities; no reporting on amount of funding used to support flood-risk reduction and resilience. Provided in annual Transportation and Housing and Urban Development Appropriations.
<b>FY2018 Funding</b>	No funding was requested by the Administration for the program. Under P.L. 115-56, FY2018 funding is similar to FY2017 levels through December 8, 2017.
<b>Authorization</b>	42 U.S.C. §5301, et seq.
<b>Website</b>	<a href="https://www.hud.gov/program_offices/comm_planning/communitydevelopment/programs">https://www.hud.gov/program_offices/comm_planning/communitydevelopment/programs</a>

**Source:** Congressional Research Service.

**Table 13. HUD: Community Development Block Grant Section 108  
Loan Guarantees**

<b>Purpose</b>	Program funds must be used to address one of three national objectives that either (1) principally benefit low- or moderate-income persons, (2) aid in eliminating or preventing slums or blight, or (3) address an imminent threat to the health or safety of residents. The program is intended to supplement the activities of the CDBG program.
<b>Eligible Flood-Related Improvements</b>	Guaranteed loan funds may be used for a number, but not all, of the activities eligible under the regular CDBG, including open-space acquisition, construction, repair, replacement, or relocation of public facilities, and improvements such as dams and levees. Funded activities must be part of a large-scale economic development, housing, or public facilities project.
<b>Type of Federal Assistance</b>	Loan guarantee secured by current and future annual allocations of CDBG funds awarded to the state or local government.
<b>Federal/Nonfederal Cost-Share</b>	No matching funds required. This is a fee-based program. HUD is authorized to charge a fee to cover the long-term cost to the Section 108 loan guarantee. HUD establishes the amount of the fee annually based on a percentage of the principal amount of the Section 108 guaranteed loan.
<b>Maximum Project Assistance</b>	Not specified. Grantees may use all or some portion of their annual CDBG allocations to access the CDBG Section 108 loan guarantee program, which allows a grantee to borrow up to five times its annual allocation for large-scale economic development, public facilities, or housing project. Flood risk reduction and resilience activities may be part of such projects.
<b>Role of Flood in Program</b>	Section 108 loan guarantees can be used to support flood-risk reduction and resilience. At the discretion of the grantee, Section 108 loans may be used for any of number of CDBG-eligible activities that address one of three national objectives, including land-use planning, open-space acquisition, hazard mitigation, and other public works and public improvement activities.
<b>Program Trigger</b>	Loan commitment ceiling established by annual appropriations.
<b>Action to Access Program</b>	Open application process with no specific deadline for submission of application. Proposed activities must meet one of the three national objectives and must be consistent with the state's or community's annual and multiyear plans outlining the proposed use of CDBG funds.
<b>Geographic Eligibility</b>	Projects in all 50 states, DC, American Samoa, Guam, Northern Marianas, Puerto Rico, and Virgin Islands.



<b>FY2017 Funding</b>	\$300.0 million loan commitments were available for FY2017 to states and local governments for all eligible activities. In FY2016, \$80.7 million in loan commitments were awarded to states and local communities, including \$17.5 million for public facilities. None of the funds were used for flood mitigation and resiliency projects. Provided in annual Transportation and Housing and Urban Development Appropriations.
<b>FY2018 Funding</b>	No funding was requested by the Administration for the program.
<b>Authorization</b>	42 U.S.C. §5308
<b>Website</b>	<a href="https://www.hudexchange.info/programs/section-108/">https://www.hudexchange.info/programs/section-108/</a>

**Source:** Congressional Research Service.

**Table 14. HUD: Community Development Block Grant–Disaster Recovery (CDBG-DR) for FY2017 Disasters**  
(as of October 2017)

<b>Purpose</b>	Program funds must be used to address long-term recovery and restoration of infrastructure, housing, and economic activity.
<b>Eligible Flood-Related Improvements</b>	The block grant nature of the program allows state and local government grant recipients to undertake any of 27 categories of eligible activities, including open-space acquisition, construction, repair, replacement, or relocation of public facilities, and improvements such as dams and levees. Activities must meet one of three national objectives: principally benefit low- and moderate-income persons; aid in eliminating or preventing slums or blight; or address an imminent threat to the health or safety of residents.
<b>Type of Federal Assistance</b>	Determined by language in the legislation providing appropriations.
<b>Federal/Nonfederal Cost-Share</b>	No matching funds required. Program funds may be used to meet the nonfederal matching fund requirement of other federal grant programs. <sup>a</sup>
<b>Maximum Project Assistance</b>	Not specified. Grantees may use CDBG–DR directly to fund mitigation activities such as buyouts.
<b>Role of Flood in Program</b>	CDBG–DR funds may be used for any of 27 eligible activities to address long-term recovery and restoration of housing, infrastructure, and economic activity at the discretion of the grantee, including land-use planning, open-space acquisition, hazard mitigation, and other public works and public improvement activities that address one of the three national objectives under the regular CDBG program.
<b>Program Trigger</b>	Appropriations provided in P.L. 115-56 and P.L. 115-31.
<b>Action to Access Program</b>	CDBG grantees must develop and HUD approve a disaster recovery action plan.
<b>Geographic Eligibility</b>	Projects in the most impacted and distressed areas resulting from a major disaster declared in 2017 pursuant to the Stafford Act.
<b>FY2017 Funding</b>	\$7.8 billion awarded to states and local governments for all eligible activities; no reporting on amount of funding used to support flood-risk reduction and resilience. HUD allocates funds based on unmet recovery needs. Funds were primarily appropriated for disaster recovery activities in areas impacted by Hurricanes Irma, Harvey, and Maria. Provided in supplemental appropriations.
<b>FY2018 Funding</b>	Not part of annual budget requests or appropriations.
<b>Authorization</b>	Provided in P.L. 115-56 (\$7.4 billion); P.L. 115-31 (\$400 million); 42 U.S.C. 5321.
<b>Website</b>	<a href="https://www.hudexchange.info/programs/cdbg-dr/cdbg-dr-grantee-contact-information/#all-disasters">https://www.hudexchange.info/programs/cdbg-dr/cdbg-dr-grantee-contact-information/#all-disasters</a>

**Source:** Congressional Research Service.

- a. CDBG-DR funds cannot duplicate funding available from federal, state, or local governments, private and nonprofit organizations, insurance proceeds, or any other source of assistance.

## Regional Assistance Example

This report focuses on programs authorized or operating nationally. It does not include federal assistance related to flood-risk reduction and resilience provided through support targeted toward specific geographic regions and/or issues. These programs may be established to respond to external events (i.e., natural or man-made disasters), and may involve one or more federal and state agencies and funding streams. In these cases, flood-risk reduction and resilience activities are often one of multiple activities authorized for the effort. One example of such a regional effort is support authorized in the Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012 (RESTORE Act).<sup>35</sup> Pursuant to that legislation, the Gulf Coast Ecosystem Restoration Council and the Department of the Treasury are expected to provide approximately \$5.3 billion in funding for multiple efforts to restore the Gulf Coast ecosystem and economy in the wake of the Deepwater Horizon oil spill in 2010.<sup>36</sup> Flood resilience efforts in the five states affected by the spill—Alabama, Florida, Louisiana, Mississippi, and Texas—are among the activities authorized in the RESTORE Act.

## Flood Insurance and Related Programs<sup>37</sup>

The NFIP is the primary source of flood insurance coverage for residential properties in the United States. The NFIP has two main policy goals: (1) to provide access to primary flood insurance, thereby allowing for the transfer of some of the financial risk of property owners to the federal government; and (2) to mitigate and reduce the nation’s comprehensive flood risk through the development and implementation of floodplain management standards.<sup>38</sup> A longer-term objective of the NFIP is to reduce federal expenditure on disaster assistance after floods. As of July 2017, the NFIP had 4.92 million flood insurance policies providing over \$1.23 trillion in coverage, with over 22,000 communities in 50 states and 6 other jurisdictions participating.<sup>39</sup> As a public insurance program, the goals of the NFIP are very different from the goals of private-sector companies, as it encompasses social goals to provide flood insurance in flood-prone areas to property owners who otherwise would not be able to obtain it and reduce government’s cost after floods.<sup>40</sup> The NFIP also engages in many “noninsurance” activities in the public interest: it identifies and maps flood hazards, disseminates flood-risk information through flood maps,

<sup>35</sup> P.L. 112-141, Title I, Subtitle F. For more information, see CRS In Focus IF10255, *Deepwater Horizon Oil Spill: Gulf Coast Restoration Efforts*, by Charles V. Stern et al.

<sup>36</sup> The funding is being made available in the Gulf Coast Ecosystem Restoration Trust Fund, and is derived from settlement penalties paid by multiple parties determined to be responsible for the spill. The council is composed of six federal members (the heads/designates of the Department of Commerce, the Environmental Protection Agency, the Corps, the Department of the Interior, the Department of Homeland Security, and the U.S. Department of Agriculture) and five Gulf Coast state representatives from Alabama, Florida, Louisiana, Mississippi, and Texas.

<sup>37</sup> This section was prepared by Diane P. Horn, Analyst in Flood Insurance and Emergency Management.

<sup>38</sup> In the context of this report, *comprehensive* flood risk means that the risk includes both financial risk (i.e., physical damage to property), but also the risk to human life.

<sup>39</sup> Indian tribes, authorized tribal organizations, Alaska Native villages or authorized native organizations, which have land-use authority, are considered communities by the National Flood Insurance Program (NFIP) and can join the program even if no flood hazard map exists that covers all tribal lands. Based on FEMA’s map inventory, 98.8% of the U.S. population is mapped with an existing flood map. Over 88% of the population lives in a community that has received a modernized product (email correspondence from FEMA Congressional Affairs staff, April 20, 2017). Detailed information about which communities participate, and where, is available from the Community Status Book, found on FEMA’s website at <https://www.fema.gov/national-flood-insurance-program-community-status-book>.

<sup>40</sup> See 82 Stat. 573 for text in original statute (§1302(c) of P.L. 90-448). This language remains in statute (see 42 U.S.C. §4001(c)).

requires community land-use and building-code standards, contributes to community resilience by providing a mechanism to fund rebuilding after a flood, and offers grants and incentive programs for household- and community-level investments in flood-risk reduction.

## **Flood Maps and State and Local Land-Use Control**

The NFIP accomplishes the goal of reducing comprehensive flood risk primarily by requiring participating communities to collaborate with FEMA to develop and adopt flood maps called Flood Insurance Rate Maps (FIRMs) and enact minimum floodplain standards based on those flood maps. The NFIP encourages communities to adopt and enforce floodplain management regulations such as zoning codes, subdivision ordinances, building codes, and rebuilding restrictions. Internal FEMA studies have found that structures built to FEMA standards experience 73% less damage than structures not built to those standards.<sup>41</sup> According to FEMA, the program saves the nation an estimated \$1.87 billion annually in flood losses avoided because of the NFIP's building and floodplain management regulations,<sup>42</sup> and FEMA expects this amount to increase over time as additional new construction is built to increasingly stronger standards.<sup>43</sup>

Communities that choose to participate in the NFIP are required to adopt land use and control measures with effective enforcement provisions and to regulate development in the floodplain.<sup>44</sup> As authorized in law, FEMA has developed a set of minimum floodplain management standards that are intended to

- (1) constrict the development of land which is exposed to flood damage where appropriate, (2) guide the development of proposed construction away from locations which are threatened by flood hazards, (3) assist in reducing damage caused by floods, and (4) otherwise improve the long-range land management and use of flood-prone areas.<sup>45</sup>

FEMA has set forth the minimum standards it requires for participation in the NFIP in federal regulations.<sup>46</sup> Though the standards appear in federal regulations, the standards have the force of law only because they are adopted and enforced by a state or local government.

FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) program is a key part of flood-risk reduction by providing information to identify flood hazards, assess flood risks, and partner with states and communities to provide flood hazard and risk data to guide mitigation actions. In order to do this, FEMA conducts Flood Insurance Studies (FISs) to produce FIRMs that depict a community's flood risk and floodplain. Flood Insurance Studies analyze the terrain and factors that affect flood hazards using specified models and the physical, hydrologic, and climate conditions in effect at the time the studies are conducted. FIRMs use the information from the FISs to delineate floodplain boundaries. FIRMs and FISs are a "snapshot" of flood risk at their time of creation, and therefore can become outdated as demographic, topographic, hydrologic, or climatic conditions change, or as engineering methods and models improve. Generally, flood

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<sup>41</sup> U.S. Congress, House Committee on Financial Services, *Flood Insurance Reform: FEMA's Perspective*, Statement of Roy E. Wright, Deputy Associate Administrator, Federal Insurance and Mitigation Administration, 115<sup>th</sup> Cong., 1<sup>st</sup> sess., March 8, 2017, H.Hrg.115-BA04-WrightR-20170309 (Washington: GPO, 2017), p. 1.

<sup>42</sup> Email correspondence from FEMA Congressional Affairs staff, June 16, 2017.

<sup>43</sup> U.S. Government Accountability Office (GAO), *Flood Insurance: Comprehensive Reform Could Improve Solvency and Enhance Resilience*, GAO-17-425, April 2017, p. 5, at <https://www.gao.gov/products/GAO-17-425>.

<sup>44</sup> 42 U.S.C. §4022(a)(1).

<sup>45</sup> 42 U.S.C. §4102(c).

<sup>46</sup> See 44 C.F.R. Part 60, particularly 44 C.F.R. §60.3.

maps may require updating when there have been significant new building developments in or near the flood zone, changes to flood protection systems, or environmental changes in the community, or when better data become available. An area of specific focus of the FIRM is the Special Flood Hazard Area (SFHA). The SFHA is intended to distinguish the flood-risk zones that have a chance of flooding during a once-in-100-year flood, or a flood of greater frequency. This means that properties have a risk of flooding of at least 1% every year if in the SFHA. However, over 20% of NFIP claims are for properties outside SFHAs.<sup>47</sup> Over the past two decades, 80% of U.S. counties have experienced 10 or more floods, and 97% of U.S. counties have experienced at least 2 floods.<sup>48</sup>

## NFIP Flood Mitigation

The NFIP offers three programs that encourage communities to reduce flood risk: the Community Rating System, the Flood Mitigation Assistance (FMA) grant program, and Increased Cost of Compliance (ICC) coverage. These programs are funded entirely by premiums and fees paid by NFIP policyholders. For more on how premiums are set for policyholders, see CRS Report R44593, *Introduction to the National Flood Insurance Program (NFIP)*, by Diane P. Horn and Jared T. Brown.

### Flood Mitigation Assistance Grant Program

FMA<sup>49</sup> awards grants for a number of purposes, including state and local mitigation planning; the elevation, relocation, demolition, or floodproofing of structures; the acquisition of properties; and other activities.<sup>50</sup> In FY2014, the FMA program was authorized to use \$100 million of NFIP revenue. It was authorized to use \$150 million in FY2015, \$175 million in FY2016, and \$175.1 million in FY2017.<sup>51</sup> The funding is available until it is expended, so the amount awarded may exceed the amount authorized by Congress in an appropriations act for a specific fiscal year. A FEMA database of approved FMA grants indicates that over \$751 million in projects has been approved between July 1997 and July 2017.<sup>52</sup>

<sup>47</sup> GAO, *Flood Insurance: Comprehensive Reform Could Improve Solvency and Enhance Resilience*, GAO-17-425, April 2017, p. 29, at <https://www.gao.gov/products/GAO-17-425>.

<sup>48</sup> FEMA, *The National Flood Insurance Program*, Presentation to the Treasury Advisory Committee on Risk Sharing Mechanisms, June 9, 2017, at [https://www.treasury.gov/initiatives/fio/acrs/ Documents/ACRSM\\_Presentation\\_By\\_FEMA.pdf](https://www.treasury.gov/initiatives/fio/acrs/ Documents/ACRSM_Presentation_By_FEMA.pdf).

<sup>49</sup> 42 U.S.C. §4104c. In 2012, Congress mandated that the grant assistance previously delivered by the Repetitive Flood Claims (RFC) and the Severe Repetitive Loss (SRL) grant programs should be unified into a single program, FMA, by rescinding the authorization for the SRL program and the RFC program. See §100225(b) and (c) of P.L. 112-114, respectively.

<sup>50</sup> For additional information on the FMA program, see 44 C.F.R. Part 78, FEMA's website at <https://www.fema.gov/flood-mitigation-assistance-grant-program>, and FEMA, *FY 2016 Flood Mitigation Assistance (FMA) Grant Program Fact Sheet*, February 15, 2016, at [http://www.fema.gov/media-library-data/1455710459301-048a67862580037b30cd640a802a9053/FY16\\_FMA\\_Fact\\_Sheet.pdf](http://www.fema.gov/media-library-data/1455710459301-048a67862580037b30cd640a802a9053/FY16_FMA_Fact_Sheet.pdf).

<sup>51</sup> See, respectively, P.L. 113-76, 128 Stat. 265; P.L. 114-4, 129 Stat. 58; P.L. 114-113, 129 Stat. 2508; and P.L. 115-31, 131 Stat. 283.

<sup>52</sup> This figure represents the total amount of federal assistance, without subtracting the cost share, for the three flood mitigation programs that existed during this time: SRL, RFC, and FMA. To access the database, see FEMA's website at <https://www.fema.gov/media-library/assets/documents/103339>.

## Community Rating System

Through a program called the Community Rating System, FEMA encourages communities to improve upon the minimum floodplain management standards required to participate in the NFIP. The Community Rating System, as authorized by law, is intended to incentivize the reduction of flood and erosion risk, as well as the adoption of more effective measures to protect natural and beneficial floodplain functions.<sup>53</sup> FEMA awards points for measures that increase a community's "class" rating in the Community Rating System on a scale of 1 to 10, with 1 being the highest ranking. Starting at Class 9, policyholders in the SFHA within a Community Rating System community receive a 5% discount on their Standard Flood Insurance Policy (SFIP) premiums, with increasing discounts of 5% per class until reaching Class 1. At that level, policyholders in the SFHA can receive a 45% discount on their flood insurance premiums. As of June 2017, 1,444 communities participated in the Community Rating System, with nearly 3.6 million policyholders. This represents about 5% of eligible NFIP communities that could participate in the Community Rating System program. However, these communities have a large number of flood policies, so more than 69% of all flood policies are written in communities participating in the Community Rating System program.<sup>54</sup> The Community Rating System discount is cross-subsidized into the NFIP program, such that the discount for one community ends up being offset by increased premium rates in all communities across the NFIP. The Community Rating System provides an average discount of 11.4% on standard flood insurance policy premiums across the NFIP. Therefore, this average 11.4% discount for Community Rating System communities is cross-subsidized and shared across NFIP communities through a cost (or load) increase of 13.4% to overall premiums in communities not participating in the Community Rating System.

The credits on premium rates for flood insurance coverage are based on the estimated reduction in flood and erosion damage risks resulting from the measures adopted by the community. Points are awarded for an array of improvements in how the community informs its public on flood risk, maps and regulates its floodplain, reduces possible flood damage, and provides immediate warnings and responds to flooding incidents. The highest points are awarded for activities that reduce future flood risk, such as development limitations, preserved open space, retrofitted buildings, and acquisition and relocation of buildings.<sup>55</sup>

## Increased Cost of Compliance Coverage

The NFIP requires most policyholders<sup>56</sup> to purchase ICC coverage, which is in effect a separate insurance policy to offset the additional expense of restoring a structure to meet more rigorous building code standards than were required when it was originally built. This ICC coverage is authorized in law, with rates for the coverage, as well as how much can be paid out for claims, set by FEMA.<sup>57</sup> Congress has capped the amount that can be paid for ICC coverage at \$75 annually.<sup>58</sup> The ICC policy has a separate rate premium structure: currently ICC premiums vary

<sup>53</sup> 42 U.S.C. §4022(b)(1).

<sup>54</sup> See FEMA, *Community Rating System Fact Sheet*, June 2017, at [https://www.fema.gov/media-library-data/1507029324530-082938e6607d4d9eba4004890dbad39c/NFIP\\_CRS\\_Fact\\_Sheet\\_2017\\_508OK.pdf](https://www.fema.gov/media-library-data/1507029324530-082938e6607d4d9eba4004890dbad39c/NFIP_CRS_Fact_Sheet_2017_508OK.pdf).

<sup>55</sup> For a list of creditable activities in the Community Rating System, see FEMA, *NFIP Community Rating Coordinator's Manual*, May 4, 2017, at [https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300\\_2017\\_CRS\\_Coordinators\\_Manual\\_508.pdf](https://www.fema.gov/media-library-data/1493905477815-d794671adeed5beab6a6304d8ba0b207/633300_2017_CRS_Coordinators_Manual_508.pdf).

<sup>56</sup> For example, ICC coverage is not required on condominium units and content-only policies.

<sup>57</sup> 42 U.S.C. §4011(b).

<sup>58</sup> *Ibid.*



between \$4 and \$70. ICC coverage provides an amount up to \$30,000 in payments for certain eligible expenses.<sup>59</sup> ICC coverage is in addition to the building coverage provided by the standard flood insurance policy. However, the payment on the building claim plus the ICC claim cannot exceed the statutory maximum payment of \$250,000 for residential structures or \$500,000 for nonresidential structures.

For example, when a building is determined by a community to be substantially damaged<sup>60</sup> following a flood, floodplain management standards adopted by local communities can require the building to be rebuilt to meet current floodplain management requirements, even if the property previously did not need to do so. For instance, the new compliance standard may require the elevation of the rebuilt building to above the base flood elevation. An ICC claim may then be submitted by the policyholder to offset the cost of complying with the elevation standard. FEMA also makes ICC coverage available if a building has been declared a repetitive loss by a community's floodplain management regulations.<sup>61</sup>

ICC claims payments may also be used toward the costs of elevating, demolishing, relocating, or floodproofing nonresidential buildings, or any combination of these actions. According to ICC data, elevation is the most common form of mitigation. Approximately 61% of all ICC claims closed with payment are single-family residential claims involving compensation for elevation of a structure to or above the BFE.<sup>62</sup> Although the cost of elevating a structure depends on the type of building and elevation requirement, the average cost of elevating an existing property has been estimated at \$33,239 to \$91,732,<sup>63</sup> and suggestions have been made for years that the amount of ICC coverage should be raised.<sup>64</sup>

In addition, FEMA has not implemented ICC coverage for two conditions for which it is authorized to do so by law. These two conditions are for properties that have sustained flood damage on multiple occasions, if the administrator determines that it is cost-effective and in the best interests of the NFIP, and for properties for which an offer of mitigation assistance is made under various federal assistance programs.<sup>65</sup>

Since the ICC was introduced in 1997, the program has received over \$1.4 billion in premiums and paid over \$700 million in claims, with over \$450 million in underwriting expenses and \$50 million of claims-handling expenses. However, between \$100 million and \$200 million has yet to be paid on claims for prior years. For the years on which FEMA has data, 2007 to 2015, the NFIP

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<sup>59</sup> For example ICC premiums, see FEMA, *Flood Insurance Manual, Rating Section*, revised October 2017, p. RATE 19, at [https://www.fema.gov/media-library-data/1503239106510-30b35cc754f462fe2c15d857519a71ec/05\\_rating\\_508\\_oct2017.pdf](https://www.fema.gov/media-library-data/1503239106510-30b35cc754f462fe2c15d857519a71ec/05_rating_508_oct2017.pdf).

<sup>60</sup> 44 C.F.R. §59.1 defines “substantial damage” as damage of any origin sustained by a structure whereby the cost of restoring the structure to its before-damage condition would equal or exceed 50% of the market value of the structure before the damage occurred.

<sup>61</sup> 42 U.S.C. §4011(b)(1).

<sup>62</sup> FEMA, *NFIP: Use of Increased Cost of Compliance Coverage*, FY2009 Report to Congress, October 2009, p. 6.

<sup>63</sup> J. C. J. H. Aerts, W. J. W. Botzen, and H. de Moel, et al., “Cost Estimates for Flood Resilience and Protection Strategies in New York City,” *Annals of the New York Academy of Sciences*, vol. 1294, no. 1 (August 2013), pp. 22-26.

<sup>64</sup> See, for example, Association of State Floodplain Managers, *Suggestions for Improving Increased Cost of Compliance Coverage under the National Flood Insurance Program*, 2007, at [http://www.floods.org/PDF/ASFPM\\_ICC\\_Positions\\_Recommendations\\_0807.pdf](http://www.floods.org/PDF/ASFPM_ICC_Positions_Recommendations_0807.pdf); FEMA, *NFIP: Use of Increased Cost of Compliance Coverage*, FY2009 Report to Congress, October 2009, p. 32; B. Lingle and C. Kousky, *Mitigation Post-Flood: FEMA's Increased Cost of Compliance (ICC) Coverage*, Resources for the Future, July 7, 2017, at <http://www.rff.org/blog/2017/mitigation-post-flood-fema-s-increased-cost-compliance-icc-coverage>.

<sup>65</sup> See 42 U.S.C. §4011(b)(3) and (4).

has lost money on ICC on a cash flow basis. During that period, on aggregate premiums of \$701 million, the NFIP had aggregate ICC underwriting losses of \$171 million.<sup>66</sup>

## Resilience-Related Policy Challenges Facing the NFIP

By rewarding behavior that reduces risks through the pricing of flood insurance policies, insurance has the potential to incentivize or even force policyholders and/or communities to address underlying flood risk. Insurance provisions also could provide incentives to limit flood damage by rewarding well-designed buildings with lower premiums, lower deductibles, or higher coverage limits. However, at present, mitigation activities form only a small part of the NFIP portfolio.

### Repetitive Flood Losses

An area of debate involves NFIP coverage of properties that have suffered multiple flood losses, which are at greater risk than the average property insured by the NFIP. One concern is the cost to the program; another is whether the NFIP should continue to insure properties likely to have further losses. According to FEMA, repetitive loss (RL)<sup>67</sup> and severe repetitive loss properties (SRL)<sup>68</sup> account for approximately \$17 billion in claims, or approximately 30% of total claims over the history of the program. As of January 31, 2017, there were 90,000 currently insured RL properties and 11,000 currently insured SRL properties. The currently insured RL and SRL properties (which represent about 2% of the overall policies in the NFIP) have accounted for approximately \$9 billion in claims, or approximately 16% of total claims over the history of the program.<sup>69</sup> A study of all of the residential NFIP claims filed between January 1978 and December 2012 showed that the magnitude of claims for RL structures as a percentage of building value was higher than non-RL properties by 5% to 20%.<sup>70</sup>

### Future Flood Losses

An increased number of properties are expected to be at risk of future flooding. A 2013 report produced at FEMA's request, *The Impact of Climate Change and Population Growth on the National Flood Insurance Program Through 2100*, concluded that by 2100, the 1% annual chance fluvial floodplain area is projected to grow nationally by about 45%.<sup>71</sup> In the populated areas of

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<sup>66</sup> Email correspondence from FEMA Congressional Affairs staff, April 3, 2017.

<sup>67</sup> The statutory definition of a repetitive loss structure is a structure covered by a contract for flood insurance that has incurred flood-related damage on two occasions in which the cost of repair, on average, equaled or exceeded 25% of the value of the structure at the time of each such flood event. In addition, at the time of the second incidence of flood-related damage, the contract for flood insurance must contain increased cost of compliance coverage. 42 U.S.C. §4121(a)(7).

<sup>68</sup> SRL properties are those that have incurred four or more claim payments exceeding \$5,000 each, with a cumulative amount of such payments over \$20,000; or at least two claims with a cumulative total exceeding the value of the property. See 42 U.S.C. §4014(h) and 44 C.F.R. §79.2(h).

<sup>69</sup> Email correspondence from FEMA Congressional Affairs staff, April 7, 2017. Almost every SRL property also fits the insurance data definition of RL property (over 99%), so the 90,000 referenced as RL above includes the 11,000 referenced as SRL. In addition, some of the properties counted in the figures since the beginning of the NFIP have been mitigated, and others are not currently insured by the program.

<sup>70</sup> Caroline Kousky and Erwann Michel-Kerjan, "Examining Flood Insurance Claims in the United States: Six Key Findings," *Journal of Risk and Insurance*, vol. 82 (2015), p. 18, at [http://opim.wharton.upenn.edu/risk/library/J2015JORI\\_Flood-Insurance-Claims\\_CK-EMK.pdf](http://opim.wharton.upenn.edu/risk/library/J2015JORI_Flood-Insurance-Claims_CK-EMK.pdf).

<sup>71</sup> AECOM, *The Impact of Climate Change and Population Growth on the National Flood Insurance Program Through 2100*, prepared for Federal Insurance and Mitigation Administration, Federal Emergency Management (continued...)

most interest to the NFIP, about 30% of these increases may be attributed to increased runoff caused by the increase in impermeable land surfaces caused by population growth/development, whereas the remaining 70% represents the influence of climate change. The implication of this is that, on a national basis, approximately 13.5% of the growth in the fluvial SHFA is likely to be due to population growth and would occur even without any climate change. For the coastal environment, the typical increase in the coastal SFHA is projected to be about 55% by 2100. Sea-level rise is not only a concern for the future; many areas are already experiencing “nuisance flooding” from minor tidal flooding or rainstorms. The frequency and duration of minor tidal flooding has increased dramatically in recent decades along many U.S. coastal areas.<sup>72</sup> Although not catastrophic, such flooding can significantly disrupt normal commerce and activity, and the seemingly minor inconveniences and local economic losses from each event can have a cumulative effect that results in considerable hidden costs to residents and businesses. In addition, the NFIP will continue to face the risk of catastrophic losses: events like Hurricanes Harvey, Irma, Maria, Katrina, and Sandy are not outside the expected range of NFIP losses.<sup>73</sup> Claims for Hurricanes Harvey and Irma are currently estimated to be about \$16 billion.<sup>74</sup>

## Policy Considerations

Recent major flood events have renewed concerns about the nation’s and the federal government’s financial exposure to flood losses, as well as the economic, social, and public health impacts of floods on individuals and communities. Part of the challenge for Congress and other policymakers in reducing flood risks and improving resilience is the distribution of responsibilities among local, state, territorial, tribal, and federal entities. There exists some tension between the broader federal interest in reducing the federal government’s exposure to costs for disaster response and recovery, and nonfederal (including private) roles in shaping how structures and facilities are built in coastal areas, floodplains, and elsewhere. Local and state governments in the United States have the primary responsibility for managing flood risk and resilience, including through guiding land use in floodplains, establishing and enforcing building codes and ordinances, and construction of public works to protect communities. At the same time, as discussed in this report, the federal government has elected to become involved in some aspects of flood-risk reduction and resilience (e.g., NFIP) and disaster response and recovery. Consequently, although the federal government does not participate in many nonfederal decisions

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Agency, Arlington, VA, June 2013, [http://web.archive.org/web/20170130025849/http://www.aecom.com/content/wp-content/uploads/2016/06/Climate\\_Change\\_Report\\_AECOM\\_2013-06-11.pdf](http://web.archive.org/web/20170130025849/http://www.aecom.com/content/wp-content/uploads/2016/06/Climate_Change_Report_AECOM_2013-06-11.pdf). No significant decreases in floodplain depth or area are anticipated for any region of the nation at the median estimates; median flows may increase even in areas that are expected to become drier on average.

<sup>72</sup> Tal Ezer and Larry P. Atkinson, “Accelerated Flooding Along the US East Coast: On the Impact of Sea Level Rise, Tides, Storms, the Gulf Stream, and the North Atlantic Oscillation,” *Earth’s Future*, vol. 2, no. 8 (August 11, 2014), pp. 362-382.

<sup>73</sup> A single storm that results in a loss to the NFIP of the size that occurred in Hurricane Katrina (\$16.3 billion) has a 1% to 2% chance of occurring in any given year, whereas a single storm that results in a loss as large as the one that occurred in Hurricane Sandy has a 4% to 5% chance of occurring in any given year. FEMA anticipates having another loss year like those within the next decade (U.S. Congress, House Committee on Financial Services, *Flood Insurance Reform: FEMA’s Perspective*, Statement of Roy E. Wright, Deputy Associate Administrator, FIMA, 115<sup>th</sup> Cong., 1<sup>st</sup> sess., March 8, 2017, H.Hrg. 115-BA04-WrightR-20170309 [Washington: GPO, 2017], p. 3).

<sup>74</sup> Office of Management and Budget, letter regarding additional funding and reforms to address impacts of recent natural disasters, October 4, 2017, at <https://www.whitehouse.gov/sites/whitehouse.gov/files/omb/Letters/Letter%20regarding%20additional%20funding%20and%20reforms%20to%20address%20impacts%20of%20recent%20natural%20disasters.pdf>.



affecting flood risk, the federal government is affected by actions by local governments, states, tribes, and territories that reduce or exacerbate flood risk.

No authoritative national estimate of the financial consequences of all types of flooding—riverine floods, coastal storms, tidal flooding, flash floods, intense precipitation, stormwater—is available.<sup>75</sup> Also, the current overall level of federal and nonfederal investments to reduce flood risk is unknown.<sup>76</sup> Consequently, it is not possible to determine how current government investment in flood-risk reduction and resilience compares to the national damage and disruption caused by flooding or to government spending on response and recovery.

Potential questions for the 115<sup>th</sup> Congress and other policymakers include the following:

- Do federal programs provide incentives or disincentives for U.S. states, local governments, territories, and tribes to prepare for flood and manage their flood risks?
- Are the level, type, and geographic distribution of federal actions for flood-risk reduction and resilience cost-effective?
- Are there changes to how federal flood-related assistance programs and the NFIP are implemented or funded that could result in long-term net benefits in avoided federal disaster assistance, lives lost, and economic disruption?

In addressing the nation's flood risk and resilience, policymakers may choose to prioritize some federal roles over others, increase or redistribute activities and funding across existing federal programs, reorient or eliminate existing programs, or establish new programs.

## CRS Reports

- CRS Report R44593, *Introduction to the National Flood Insurance Program (NFIP)*, by Diane P. Horn and Jared T. Brown.
- CRS Report RL34537, *FEMA's Pre-Disaster Mitigation Program: Overview and Issues*, by Jared T. Brown.
- CRS Report R43520, *Community Development Block Grants and Related Programs: A Primer*, by Eugene Boyd.
- CRS Report R41243, *Army Corps of Engineers: Water Resource Authorizations, Appropriations, and Activities*, by Nicole T. Carter and Charles V. Stern.
- CRS Report R44963, *Wastewater Infrastructure: Overview, Funding, and Legislative Developments*, by Jonathan L. Ramseur.

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<sup>75</sup> Some estimates include some types of flooding and not others; some estimates include all consequences from an event (e.g., wind damage, economic disruption costs), whereas other estimates relate more closely to flood-related costs. For example, for the 16 hurricanes from 2000 to 2015 with more than \$1 billion in estimated damages, the Congressional Budget Office (CBO) found a total of \$209 billion in federal discretionary funds were aimed at helping individuals, businesses, and communities address various types of hurricane damage (Congressional Budget Office, *Potential Increases in Hurricane Damage in the United States: Implications for the Federal Budget*, June 2016, Table 3, <https://www.cbo.gov/sites/default/files/114th-congress-2015-2016/reports/51518-hurricane-damage-onecol.pdf>). Of the 16 hurricanes that CBO analyzed, the two storms with the highest percentages of federal spending were the two storms causing the most economic damage.

<sup>76</sup> Flood-risk reduction and flood resilience activities are not typically tracked as separate line-items in federal agencies' budget documents or reported in a consolidated format. For some types of activities that cut across many different agencies, OMB may prepare a "cross-cut" budget. However, there is no cross-cut budget that identifies federal flood-risk reduction and resilience spending.

- CRS Report R44632, *Sea-Level Rise and U.S. Coasts: Science and Policy Considerations*, by Peter Folger and Nicole T. Carter.
- CRS Report R40763, *Agricultural Conservation: A Guide to Programs*, by Megan Stubbs.
- CRS Report R42854, *Emergency Assistance for Agricultural Land Rehabilitation*, by Megan Stubbs.

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