



Testimony

Before the Subcommittee on Emergency Management, Intergovernmental Relations, and the District of Columbia: Committee on Homeland Security and Governmental Affairs; U.S. Senate

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# DISASTER RESILIENCE

## Actions Are Underway, but Federal Fiscal Exposure Highlights the Need for Continued Attention to Longstanding Challenges

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# GAO Highlights

Highlights of [GAO-14-603T](#), a testimony before the Subcommittee on Emergency Management, Intergovernmental Relations, and the District of Columbia; Committee on Homeland Security and Governmental Affairs; U.S. Senate

## Why GAO Did This Study

Multiple factors including increased disaster declarations, climate change effects, and insufficient premiums under the National Flood Insurance Program increase federal fiscal exposure to severe weather events. Managing fiscal exposure from climate change and the National Flood Insurance Program are both on GAO's High Risk list. GAO has previously reported that building resilience to protect against future damage is one strategy to help limit fiscal exposure. However, in prior reports GAO also identified multiple challenges to doing so. Responsibility for actions that enhance resilience rests largely outside the federal government, so nonfederal entities also play a key role.

This testimony discusses (1) resilience-building challenges GAO has previously identified; (2) federal efforts to facilitate resilience-building as part of Hurricane Sandy recovery; and (3) examples of nonfederal efforts to incentivize resilience building. This testimony is based on previous GAO reports issued from 1998 through 2014 related to hazard mitigation, climate change, flood insurance, and preliminary observations from GAO's ongoing work for this committee on federal resilience efforts related to the Sandy recovery. For the ongoing work, GAO reviewed documents such as the Hurricane Sandy Rebuilding Strategy and a 2012 National Academies Study on building resilience. GAO also interviewed officials from FEMA and the Department of Housing and Urban Development (HUD).

View [GAO-14-603T](#). For more information, contact Chris Currie, (404) 679-1875, [curriec@gao.gov](mailto:curriec@gao.gov)

May 14, 2014

## DISASTER RESILIENCE

### Actions Are Underway, but Federal Fiscal Exposure Highlights the Need for Continued Attention to Longstanding Challenges

## What GAO Found

GAO has identified various challenges to resilience building—actions to help prepare and plan for, absorb, recover from, and more successfully adapt to adapt to adverse events including those caused by extreme weather. These include challenges for communities in balancing hazard mitigation investments with economic development goals, challenges for individuals in understanding and acting to limit their personal risk, and broad challenges with the clarity of information to inform risk decision making. GAO's work over more than 30 years demonstrates that these are longstanding policy issues, without easy solutions. The Department of Homeland Security's (DHS) May 2013 release of a National Mitigation Framework and establishment of a group to help coordinate interagency and intergovernmental mitigation efforts offers one avenue for leadership on these issues.

In ongoing work on federal resilience efforts in the aftermath of Hurricane Sandy, GAO identified three high-level actions that demonstrated an intensified federal focus on incorporating resilience-building into the recovery.

- The President issued an executive order to coordinate the recovery effort and created a task force that issued 69 recommendations aimed at improving recovery from Sandy and future disasters—including recommendations designed to facilitate resilient rebuilding.
- Congress appropriated about \$50 billion in supplemental funds for multiple recovery efforts, including at least five federal programs that help support resilience-building efforts. One of these, FEMA's Hazard Mitigation Grant Program (HMGP), is the only federal program designed specifically to promote mitigation against future losses in the wake of a disaster; while, another, the Public Transportation Emergency Relief Program made more than \$4 billion available for transit resilience projects.
- The Sandy Recovery Improvement Act of 2013 provided additional responsibilities and authorities related to FEMA's mitigation and recovery efforts. In response, FEMA has undertaken efforts to make HMGP easier for states to use—for example by streamlining application procedures. The act also provided additional authorities for FEMA to fund hazard mitigation with other disaster relief funds and required FEMA to provide recommendations for a national strategy on reducing the cost of future disasters to Congress, which FEMA finalized in September 2013.

For the purposes of this statement GAO reviewed studies that discuss resilience building and climate change adaptation and identified examples efforts at the state and local levels that illustrate a variety of nonfederal initiatives that may drive communities to build resilience. For example, a nonprofit group is creating report cards to assess the resilience of a building to earthquakes and plans to extend these efforts to wind and flood risk. In some localities public-private partnerships have helped promote efforts to buy properties that were at risk from repeat losses.

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Chairman Begich, Ranking Member Paul, and Members of the Subcommittee:

I appreciate the opportunity to testify before you today about disaster mitigation and resilience, especially given the \$50 billion in federal dollars recently appropriated for recovery from Hurricane Sandy.<sup>1</sup>

The term resilience refers to the ability to prepare and plan for, absorb, recover from, and more successfully adapt to actual or potential adverse events. Hazard mitigation and climate adaptation are strategies to promote resilience to extreme weather events, among other things. The term mitigation, in this context, describes the capabilities necessary to reduce loss of life and property by lessening the impact of disasters; while, climate change adaptation is specific to such adjustments made in response to actual or expected climate change. These resilience-building strategies include efforts to protect critical infrastructure and reduce specific vulnerabilities—by for example, increasing the capacity of storm water systems and raising river or coastal dikes.

As we reported in 2012, from fiscal years 2004 through 2011, the Federal Emergency Management Agency (FEMA) obligated over \$80 billion in federal assistance for disasters, and the growing number of major disaster declarations had contributed to increasing federal disaster assistance expenditures.<sup>2</sup> Moreover, the United States Global Change Research Program has reported that the impacts and costliness of weather disasters—resulting from floods, drought, and other events such as hurricanes—will increase in significance as what are considered “rare” events become more common and intense due to climate change.<sup>3</sup> In

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<sup>1</sup>The Disaster Relief Appropriations Act of 2013 (appropriated approximately \$50 billion for disaster recovery Pub. L. No. 113-2, div. A, 127 Stat. 4 (2013). The majority of appropriation accounts that received funding were subject to a reduction of 5.0 percent of their budgetary resources.

<sup>2</sup>GAO, *Federal Disaster Assistance: Improved Criteria Needed to Assess a Jurisdiction’s Capability to Respond and Recover on Its Own*, [GAO-12-838](#) (Washington, D.C.: Sep. 12, 2012).

<sup>3</sup>Thomas R. Karl, Jerry M. Melillo, and Thomas C. Peterson, eds. *Global Climate Change Impacts in the United States*, (Cambridge University Press: 2009) and Melillo, Jerry M., Terese (T.C.) Richmond, and Gary W. Yohe, eds. *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program (U.S. Government Printing Office: 2014).

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addition, less acute effects of changes in the climate, such as sea level rise, could also result in significant long-term effects on people and property. In 2013, we added managing fiscal exposure due to climate change to our High Risk list, in part, because of concerns about these increasing costs.<sup>4</sup>

We also designated the National Flood Insurance Program—a key component of the federal government’s efforts to limit the financial impact of floods—as a high risk area and included it on our High Risk list in March 2006.<sup>5</sup> The program faces challenges with long-term sustainability—as of December 2013, FEMA’s debt from flood insurance payments totaled about \$24 billion—and FEMA had not repaid any principal on the loan since 2010—which compounds fiscal exposure arising from severe weather events.

We and others have recommended building in resilience—by taking actions to mitigate vulnerabilities to the effects of severe weather and to adapt to effects of climate change—as one strategy to help to limit the nation’s fiscal exposure.<sup>6</sup> However, we have previously identified a variety of challenges associated with such resilience-building efforts.

In October 2012, Hurricane Sandy devastated the Eastern seaboard and resulted in tens of billions of dollars damage from the Mid-Atlantic to the Northeast. At the same time, an executive order and legislation in the wake of the devastation signaled an increased focus from both the President and Congress on building resilience into recovery efforts.

We currently have ongoing work for this committee evaluating select federal efforts to facilitate resilience planning and activities as part of the Sandy recovery effort, which we plan to issue later this year. My statement today is based on previously published and ongoing work and it discusses select (1) resilience-building challenges we have previously identified; (2) federal efforts to facilitate resilience-building as part of the

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<sup>4</sup>GAO, *High-Risk Series: An Update*, [GAO-13-283](#) (Washington, D.C.: Feb. 14, 2013).

<sup>5</sup>GAO’s *High Risk Program*, [GAO-06-497T](#) (Washington, D.C.: Mar. 15, 2006).

<sup>6</sup>The term fiscal exposure refers to the responsibilities, programs, and activities that may either legally commit the federal government to future spending or create the expectation for future spending. See GAO *Fiscal Exposures: Improving Cost Recognition in the Federal Budget*, [GAO-14-28](#) (Washington, D.C.: Oct. 29, 2013).

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Sandy recovery; and (3) examples of nonfederal efforts to incentivize resilience building.

This statement is based on reports we issued from January 1998 to August 2007 on hazard mitigation and resilience-building activities and ongoing work for this committee evaluating federal efforts to facilitate resilience planning and activities as part of the Sandy recovery efforts. Specifically, to describe resilience building challenges we have previously identified, we consulted our prior reports and testimonies (see Related GAO Products at the end of this statement). For our prior work, among other things, we reviewed key federal documents and efforts such as previous congressional reports and publications from the federal agencies involved in mitigation activities, analyzed information collected from relevant agencies and officials, and visited locations with comprehensive mitigation programs. Further details on the scope and methodology of our previously issued reports are available within each of the published products. For our ongoing work on federal mitigation efforts, we reviewed documents such as the Hurricane Sandy Rebuilding Strategy and FEMA's report on recommendations for a national strategy to reduce the costs of future disasters, and studies on nonfederal resilience-building efforts, and we interviewed federal officials at FEMA and the Department of Housing and Urban Development (HUD).<sup>7</sup> We shared a copy of the new information in this statement with Department of Homeland Security (DHS) officials.

The work upon which this testimony is based was and is being conducted in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>7</sup>Specifically, we reviewed a 2012 study by the National Academies National Resource Council and a 2013 study by the Columbia Center for Climate Change and selected examples to demonstrate a range of nonfederal efforts to incentivize resilience building.

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## Longstanding Challenges Inhibit Efforts to Promote Resilience

Challenges we identified with disaster resilience as long ago as 1980 have persisted and were reflected in our work on disaster mitigation in 2007, as well as recent studies such as a 2012 National Academies National Research Council (NRC) study on disaster resilience.<sup>8</sup>

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## State and Local Governments May Have Concerns about Competing Priorities for Economic Development and Resilience Building

We testified in January 1998 that, for a number of reasons, state and local governments may be reluctant to invest in resilience-building efforts.<sup>9</sup> For example, leaders may be concerned that hazard mitigation activities will detract from economic development goals and may perceive that mitigation is costly and involves solutions that are overly technical and complex.

In our work on hazard mitigation issued in August 2007, we found that these issues persisted. We reported that hazard mitigation goals and local economic interests often conflict, and the resulting tension can often have a profound effect on mitigation efforts.<sup>10</sup> For example, we reported that community goals such as building housing and promoting economic development may be higher priorities than formulating mitigation regulations that may include restrictive development regulations and more stringent building codes. In particular, local government officials we contacted as part of that work commented that developers often want to increase growth in hazard-prone areas (e.g., along the coast or in floodplains) to support economic development. These areas are often desirable for residences and businesses, and such development increases local tax revenues but is generally in conflict with mitigation goals.

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<sup>8</sup>National Research Council. *Disaster Resilience: A National Imperative*. Washington, DC: The National Academies Press, 2012.

<sup>9</sup>*Disaster Assistance: Information on Federal Disaster Mitigation Efforts* (GAO/T-RCED-98-67, Jan. 28, 1998).

<sup>10</sup>GAO, *Natural Hazard Mitigation: Various Mitigation Efforts Exist, but Federal Efforts Do Not Provide a Comprehensive Strategic Framework* (GAO-07-403, Aug 22, 2007). We recommended that the Administrator of FEMA, in consultation with other appropriate federal agencies, develop and maintain a national comprehensive strategic framework for mitigation. In 2013, DHS published the National Mitigation Framework to provide the strategic framework we recommended.

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In 2012, the National Academies National Research Council (NRC) issued a report on disaster resilience, noting that understanding, managing, and reducing disaster risks provide a foundation for building resilience to disasters.<sup>11</sup> Risk management—both personal and collective—is important in the resilience context because the perceptions of and choices about risk shape how individuals, groups, and public- and private-sector organizations behave, how they respond during and after a disaster event, and how they plan for future disasters. However, the National Academies report described a variety of challenges that affect risk management. As with our 1998 and 2007 work, one of the key challenges the NRC reported for state and local governments was reluctance to limit economic development with resilience measures.

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### Individuals May Lack Incentives and Understanding of Risk When Deciding Whether to Invest in Resilience-Building Efforts

We testified in January 1998 that individuals may also lack incentives to take resilience-building measures.<sup>12</sup> We noted that increasing the awareness of the hazards associated with living in a certain area or previous experience with disasters do not necessarily persuade individuals to take preventive measures against future disasters. Residents of hazard-prone areas tend to treat the possibility of a disaster’s occurrence as sufficiently low to permit them to ignore the consequences.

We have also reported that the availability of federal assistance may inhibit actions to mitigate disaster losses. As long ago as 1980, we reported that individuals may not act to protect themselves from the effects of severe weather if they believe the federal government will eventually help pay for their losses.<sup>13</sup> The 1993 National Performance Review also found that the availability of post-disaster federal funds may reduce incentives for mitigation.<sup>14</sup> Moreover, FEMA’s 1993 review of the National Earthquake Hazards Reduction Program concluded that at the state level there is “the expectation that federal disaster assistance will

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<sup>11</sup>National Research Council. *Disaster Resilience: A National Imperative*. Washington, DC: The National Academies Press, 2012.

<sup>12</sup>[GAO/T-RCED-98-67](#).

<sup>13</sup>Federal Disaster Assistance: What Should The Policy Be? (PAD-80-39, June 16, 1980).

<sup>14</sup>Creating a Government That Works Better and Costs Less: Federal Emergency Management Agency, National Performance Review (Washington, D.C.: GPO, 1993).

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address the problem after the event.”<sup>15</sup> Concerns about individuals’ ability to appropriately evaluate risk and take action to protect themselves continued in our August 2007 work when we reported that individuals often have a misperception that natural hazard events will not occur in their community and are not interested in learning of the likelihood of an event occurring.<sup>16</sup> Likewise, the 2012 NRC report on disaster resilience identified the key risk management challenge for homeowners and businesses in hazard-prone areas is the fact that they may be unaware of or underestimate the hazards that they face.<sup>17</sup>

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### Information Required to Support Risk Decision Making is Imprecise, Incomplete, and Complex

In January 1998, we described three sets of issues that complicate assessing the cost-effectiveness of actions to build resilience.<sup>18</sup> At the same time, we testified that a lack of comprehensive, reliable data to make decisions about cost-benefit tradeoffs may also inhibit local governments from deciding to invest in hazard mitigation activities. First, we noted that by definition, natural hazard mitigation reduces the loss of life and property below the levels that could be expected without mitigation, but it is impossible to measure what loss would have been incurred without mitigation. Second, the dispersion of mitigation funds and responsibilities across various agencies makes it difficult to determine the collective benefit of federal efforts. Finally, we noted that federal savings depend on the frequency of future disasters and the extent to which the federal government will bear the resulting losses, which is unknown.

Moreover, in 2007 we reported that limited public awareness may also be a result of the complexity of the information that is needed for individuals to understand their hazard risks.<sup>19</sup> We concluded that for local decision makers to develop mitigation strategies for their communities they need appropriate and easily understandable information about the probability of natural hazards and that efforts to improve public awareness and

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<sup>15</sup>Improving Earthquake Mitigation, FEMA, report to the Congress as required under Pub. L. No. 101-614, § 14(b), 104 Stat. 3231, 3242 (1993), p. 15.

<sup>16</sup>[GAO-07-403](#).

<sup>17</sup>National Research Council. *Disaster Resilience: A National Imperative*. Washington, DC: The National Academies Press, 2012.

<sup>18</sup>[GAO/T-RCED-98-67](#).

<sup>19</sup>[GAO-07-403](#).



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education are long-term and require sustained effort. Similarly, in our February 2014 testimony on limiting fiscal exposure from and increasing resilience to climate change, we noted that local decision makers need expert assistance translating climate change information into something that is locally relevant. The 2012 NRC study identified understanding how to share scientific information with broad audiences as one of the key challenges for resilience researchers.

The challenges we identified in prior work—competing priorities for state and local governments, imperfect individual risk decision making, and imprecise, incomplete, and complex information about both risk and benefits—are difficult issues that are likely to persist. These issues are longstanding and difficult policy issues. Indeed, the increasing number of federal disaster declarations and the growing role of the federal government in funding post disaster relief and recovery efforts may serve to exacerbate some of the inherent challenges. We are encouraged DHS finalized the National Mitigation Framework in 2013 to coordinate interagency and intergovernmental efforts and that the framework established a Mitigation Framework Leadership Group to coordinate mitigation efforts of relevant local, state, tribal, and federal organizations. The framework and the group create an avenue for interagency and intergovernmental leadership to pursue solutions to these difficult policy issues. As part of our ongoing work, we plan to evaluate the status of the Mitigation Framework Leadership Group and the actions taken to-date to apply the National Mitigation Framework in the context of recovery from Hurricane Sandy.

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## Federal Response to Hurricane Sandy Demonstrated Increased Focus on Mitigation and Resilience-Building

In ongoing work on federal resilience efforts in the aftermath of Hurricane Sandy, we identified three high-level actions that demonstrated an intensified federal focus on incorporating resilience-building into the recovery.

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## The President's Executive Order on Sandy Rebuilding Charged Federal Agencies with Facilitating Resilience

In the wake of Hurricane Sandy, President Obama signed Executive Order 13632 on December 7, 2012.<sup>20</sup> The Executive Order created the Hurricane Sandy Rebuilding Task Force, chaired by the HUD Secretary and consisting of more than 23 federal agencies and offices. Among other things, the executive order charged the task force to work with partners in the affected region to understand existing and future risks and vulnerabilities from extreme weather events; identify resources and authorities that strengthen community and regional resilience during recovery; and plan for the rebuilding of critical infrastructure in a manner that increases community and regional resilience. The order also charged the task force with helping to identify and remove obstacles to resilient rebuilding to promote long-term sustainability of communities and ecosystems.

In August 2013, the Sandy Rebuilding Task Force issued the Hurricane Sandy Rebuilding Strategy, which contained 69 recommendations to various federal agencies and their nonfederal partners aimed at improving recovery from both Hurricane Sandy and future disasters. Among these 69 recommendations are many that take into account the President's charge to facilitate planning and actions to build resilience in the Sandy-affected region. Introducing the strategy, the task force chair acknowledged how critical it was that efforts to rebuild for the future make communities more resilient to emerging challenges such as rising sea levels, extreme heat, and more frequent and intense storms.

The task force report notes that many of the recommendations have been adopted and describes actions underway to implement them as part of the Hurricane Sandy recovery effort. Key examples of long-term resilient rebuilding initiatives to address future risks to extreme weather events include the Rebuild by Design effort and the New York Rising Community Reconstruction Program. In June 2013, HUD and its partners launched the Rebuild by Design competition to challenge communities to develop solutions to address structural and environmental vulnerabilities exposed by Hurricane Sandy. Of the 148 applicants, HUD selected 10 to move

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<sup>20</sup>Exec. Order No. 13,632, 77 Fed. Reg. 74,341 (Dec. 14, 2012).

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forward.<sup>21</sup> The selected teams then worked with local stakeholders to tailor their projects to the communities and hosted over 50 community workshops to educate the communities on their proposals and the theme of resilience. On April 3, 2014, the final proposals were exhibited and evaluated by an expert jury. Winning design solutions may be awarded disaster recovery grants from HUD and other public and private partners. Some resilience aspects of the designs include elevating streets and adding breakwater systems.

The New York Rising Community Reconstruction Program is another mitigation program that provides over \$650 million for additional rebuilding and revitalization planning and implementation assistance to Sandy-affected communities. As of May 2014, six regions of New York comprised of 102 localities and 50 New York Rising communities created plans that assessed storm damage and current risk, identified community needs and opportunities, and developed recovery and resilient strategies. Each locality is eligible for \$3 million-\$25 million from HUD and other public and private partners. According to the State of New York, as of May 2014, multiple projects had been awarded funding.

As part of our ongoing work on resilience-building as part of the Hurricane Sandy recovery, we are identifying recommendations from the task force report that particularly support resilient rebuilding and assessing the actions taken to date to implement them. We plan to issue a report on these issues later this year.

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<sup>21</sup>The 10 selected design opportunities applied the Infrastructure Resilience Guidelines set forth in the Sandy Task Force report. The purpose of the guidelines is to outline standards to help govern federal funding for Sandy-related infrastructure investments and promote regional resilience. All federal, state, and local projects must adhere to the seven guidelines to receive federal funding. The guidelines require that all projects have: comprehensive analysis, transparent and inclusive decision processes, regional resilience, long-term efficacy and fiscal sustainability, environmentally sustainable and innovative solutions, targeted financial incentives, and adherence to resilience performance standards.

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## Congress Appropriated Funds to Key Federal Programs that Can Help Support Resilient Rebuilding

In January 2013, Congress passed and the President signed the Disaster Relief Appropriations Act, 2013 (Sandy Supplemental), which appropriated about \$50 billion in funding to support recovery.<sup>22</sup> The Sandy Supplemental appropriated funds—primarily for programs and activities associated with recovery from Hurricane Sandy—to nineteen federal agencies. Among the nineteen agencies, four—DHS, HUD, the Department of Transportation (DOT), and U.S. Army Corps of Engineers (USACE)—received amounts that represent over 92 percent of the total with appropriations ranging from \$5 billion to \$15 billion.<sup>23</sup> These four agencies administer five programs that play a key role in helping to promote resilience-building as part of recovery: (1) FEMA’s Hazard Mitigation Grant Program (HMGP), (2) FEMA’s Public Assistance Program (PA), (3) HUD’s Community Development Block Grant-Disaster Recovery (CDBG-DR) Program, (4) DOT’s Federal Transit Administration (FTA) Public Transportation Emergency Relief Program, and (5) USACE’s Flood Risk Management Program. See table 1 for a description of these programs and how they help to support resilience-building efforts.

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<sup>22</sup>Pub. L. No. 113-2, 127 Stat. 4 (2013).

<sup>23</sup>The amounts received by these four federal agencies reflect the adjustment for sequester.

**Table 1: Key Federal Programs Funded by Sandy Supplemental that Support Resilience Building**

Agency	Program	Who Can Apply	How It Supports Resilience-Building	How It Is Used in Sandy Recovery
Federal Emergency Management Agency (FEMA)	Hazard Mitigation Grant Program	state, tribal, and local governments	the only federal program explicitly designed to improve resilience to future disasters during recovery funds a wide range of projects, including purchasing properties in flood-prone areas, adding shutters to windows to prevent future damage from hurricane winds and rains, or rebuilding culverts in drainage ditches to prevent future flooding damage	FEMA estimates that the program will provide about \$349 million from inception through fiscal year 2014 for mitigation activities.
FEMA	Public Assistance	state, tribal, and local governments and some nonprofit organizations	may fund measures to reduce future risks in conjunction with repair of disaster damaged facilities if cost-effectiveness can be demonstrated	In total, FEMA estimates that it will spend \$8.5 billion on public assistance for Sandy recovery by the end of fiscal year 2014, some of which can be used to reduce future risks
Housing and Urban Development (HUD)	Community Development Block Grant—Disaster Recovery	states and local governments—not less than 50 percent of funds must benefit low and moderate income persons, but grantees may seek to reduce the overall benefit requirement below the 50 percent with justification	designed to address needs not met by other disaster recovery programs, which can include resilience-building projects	In conjunction with its leadership on the Sandy Rebuilding Task Force, HUD linked key resilience-building initiatives to the grant program. For example, these funds can be awarded to Rebuild by Design and New York Rising communities to carry out those projects.
Federal Transit Administration	Public Transportation Emergency Relief Program	transit authorities	can fund transit resilience projects	\$4.3 billion has been made available for resilience projects
U.S. Army Corps of Engineers (USACE)	National Flood Risk Management Program	not a grant program	costal and river flood prevention	USACE is using a portion of its \$5 billion in Sandy Supplemental funds—about \$1 billion—to reduce future flood risk in ways that will support the long term sustainability of the costal ecosystem and communities and reduce the economic costs associated with large-scale flooding.

Source: GAO Analysis of Federal Guidance and Policy

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As part of our ongoing work we plan to focus on efforts within FEMA's HMGP and PA and HUD's CDBG-DR to facilitate and support community and regional resilience efforts as part of recovery from Hurricane Sandy. We are evaluating federal actions, gathering perspectives from key state officials, and studying at least one large-scale PA project that involves resilience-building activities.

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### Legislation to Improve Recovery Activities Also Focuses on Resilient Rebuilding

The Sandy Recovery Improvement Act of 2013 (SRIA) was enacted as part of the Sandy Supplemental.<sup>24</sup> The law authorizes several significant changes to the way FEMA may deliver federal disaster assistance. FEMA is tracking its implementation of 17 provisions of the act, of which are aimed at mitigating future damage. Specifically:

- **Public Assistance Work Alternative Procedures.** This section authorizes FEMA to implement alternative procedures for administration of the PA program with the aim of providing greater flexibility and less administrative burden by basing grants on fixed estimates. Among the provisions in this section of SRIA is one that would allow use of all or part of the excess grant funds awarded for the repair, restoration, and replacement of damaged facilities for cost effective activities that mitigate the risk of future damage, hardship, or suffering from a major disaster.
- **Changes to HMGP.** SRIA authorized three key changes to HMGP. First, it authorizes FEMA to expedite implementation of the program. FEMA has issued guidance for streamlining the program and is planning actions to continue to refine the changes and measure their effectiveness. Second, SRIA allows FEMA to provide up to 25 percent of the estimated costs for eligible hazard mitigation measures to a state or tribal grantee before eligible costs are incurred. As part of the revised, streamlined HMGP guidance, FEMA has informed states of this provision. Third, SRIA allows FEMA to waive notice and comment rulemaking procedures for HMGP Administration by States and authorizes FEMA to carry out the program as a pilot. FEMA is currently carrying out a pilot program and issued a notice in the Federal Register in March 2014 seeking comments from the public to help inform the development of this new method of program delivery.<sup>25</sup> To develop the program, FEMA is exploring the extent to

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<sup>24</sup>Pub. L. No. 113-2, Div. B, 127 Stat. 4, 39 (2013).

<sup>25</sup>79 Fed. Reg. 13,970 (Mar. 12, 2014).

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which its determinations regarding cost-effectiveness, technical feasibility and engineering, and final eligibility and funding can be made at the state level.

- **National Strategy to Reduce Costs on Future Disasters.** SRIA required FEMA to make recommendations for the development of a national strategy to reduce costs on future disasters. In September 2013 FEMA issued the required report, recommending that the following elements be considered in the development of a national strategy: 1) engage in a whole community dialogue and build upon public-private partnerships, 2) enhance data-driven decisions, 3) align incentives promoting disaster cost reduction and resilience, 4) enable resilient recovery, and 5) support disaster risk reduction nationally.<sup>26</sup>

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## Nonfederal Groups Have a Variety of Initiatives to Help Incentivize Resilience Building

As we have previously reported, most responsibility and authority for resilience activities rests largely outside the federal government; therefore, nonfederal incentives are also a critical piece of the overall strategy to reduce future losses.<sup>27</sup> The federal government, by providing incentives through programs like the five discussed earlier in this statement, can help to promote and facilitate mitigation before and after disasters. However, ultimately, nonfederal entities inside and outside the government make the decisions that lead (or do not lead) to resilience activities. Several examples of mitigation efforts at the state and local levels help illustrate the variety of ways that incentives help drive communities to be more resilient—with a range of activities from shoring up building codes to facilitating buyouts of repetitive loss properties.

As part of our ongoing work, we are reviewing studies about efforts to build resilience to extreme weather events and climate change. For the purposes of these statement, we selected illustrative examples from those studies to describe a range of nonfederal efforts to incentivize mitigation.

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<sup>26</sup> National Strategy Recommendations: Future Disaster Preparedness, Federal Emergency Management Agency (FEMA) Washington, D.C., September 2013.

<sup>27</sup> [GAO/T-RCED-98-67](#) and [GAO-07-403](#).

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The 2012 NRC report discussed earlier in this statement included several examples of earthquake mitigation efforts in California.<sup>28</sup>

- In California, zones of potential landslide, liquefaction, or fault rupture hazard have been mapped by the California Geological Survey as “special study zones” according to provisions in the California Alquist-Priolo Earthquake Fault Zoning Act of 1972. If a property is in one of these special study zones, the buyers must sign a form indicating that they have been made aware of this potential hazard and recognize that additional inspections and work may be required if they choose to modify the property in the future.
- The U.S. Resiliency Council, a nonprofit organization based in California, is working on creating building “report cards” to provide technically defensible metrics to evaluate and communicate the resilience of individual buildings. The initial focus is on seismic risk, and officials plan to extend their efforts to creating metrics for resilience to catastrophic wind and flood risk. Transparency and required disclosure of these individual building resilience ratings can benefit building users, owners, and lenders by increasing the value of well designed or properly retrofitted properties.
- The Property Transfer Tax Program in Berkeley, California has provided funds for seismically retrofitting a number of properties in the city. In 1992, voters approved an additional 0.5 percent transfer tax on top of the existing 1 percent tax on all real estate transactions, with the tax paid equally by buyer and seller. This portion of the transfer tax is available for voluntary seismic upgrades to residential property. Residential property owners have up to 1 year to complete the seismic retrofit (or lose the funds). Since many homes sell for \$750,000 to \$1 million or more in Berkeley, this amounted to \$3,750-5,000 in “free funds” and can cover homeowner upgrades such as brick chimney bracing or anchoring water heaters. This incentive program has an 80 to-90 percent participation rate. Along with other measures, this program has led to more than 60 percent of the residences in Berkeley becoming more resistant to earthquakes.

Similarly, the Columbia Center for Climate Change Law of Columbia Law School issued a report in 2013 that included examples of flood mitigation efforts in North Dakota and Iowa.<sup>29</sup>

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<sup>28</sup>National Research Council. *Disaster Resilience: A National Imperative*. Washington, DC: The National Academies Press, 2012.



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- In 1996, 83 percent of the homes in Grand Forks, ND were damaged when the Red River reached 54 feet and topped the city dikes. Using CDBG funding, the City of Grand Forks purchased 802 lots, moved salvageable homes, and destroyed the remainder to create a green space. The city also partnered with a private development company to finance the construction of 180 new homes in an underdeveloped area of Grand Forks to help relocate some of the people who had lost their homes in the flooding and subsequent buy-out program.
  - In 1993, the Iowa River flooded, and overtopped existing levees. The US Army Corps of Engineers planned to rebuild and repair the levees—but a working group of state and federal agencies determined that the best solution would be to buy all the homes in the levee district so that it could be statutorily dissolved and the city would no longer have to support the infrastructure in the area. The buyout program developed a novel land-transfer system and engaged government agencies and non-profit organizations to execute it. The non-profit organization’s role was instrumental because landowners were hesitant to sell their property to the government, but were comfortable selling it to the non-profit. The non-profit used a formula to set the land price, which contributed to the success of the buyout because purchasers didn’t have to negotiate prices with each individual landowner and it removed the incentive for landowners to hold out for a better price.

Chairman Begich, Ranking Member Paul, and members of the subcommittee, this completes my prepared statement. I would be happy to respond to any questions you may have at this time.

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## GAO Contacts and Staff Acknowledgements

If you or your staff members have any questions about this testimony, please contact me at (404) 679-1875 or [curriec@gao.gov](mailto:curriec@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this statement. Christopher Keisling, Assistant Director; and Katherine Davis, Dorian Dunbar, Melissa Duong, Kathryn Godfrey, Tracey King, Amanda Miller, and Linda Miller, made contributions to this testimony. In addition, Martha Chow, Steve Cohen, Stanley Czerwinski, Roshni Davé, Peter Del Toro, Chris Forys, Daniel Garcia-Diaz, Alfredo Gomez, Michael Hix, Karen Jarzynka-Hernandez, Jill Naamane, Brenda Rabinowitz, Joe Thompson, Lisa Van Arsdale, Pat

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<sup>29</sup>Managed Coastal Retreat: A Handbook of Tools, Case Studies, and Lessons Learned, Columbia Center for Climate Change Law, October 2013 New York, NY

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Ward, David Wise, and Steve Westley also made contributions based on published and related work.

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*Federal Disaster Assistance: Improved Criteria Needed to Assess a Jurisdiction's Capability to Respond and Recover on Its Own.* [GAO-12-838](#). Washington, D.C.: September 12, 2012.

*Natural Hazard Mitigation: Various Mitigation Efforts Exist, but Federal Efforts Do Not Provide a Comprehensive Strategic Framework.* [GAO-07-403](#). Washington, D.C.: August 22, 2007.

*High Risk Series: GAO's High-Risk Program.* [GAO-06-497T](#). Washington, D.C.: March 15, 2006.

*Disaster Assistance: Information on the Cost-Effectiveness of Hazard Mitigation Projects.* [GAO/T-RCED-99-106](#). Washington, D.C.: March 4, 1999.

*Disaster Assistance: Information on Federal Disaster Mitigation Efforts.* [GAO/T-RCED-98-67](#). Washington, D.C.: January 28, 1998.

*Disaster Assistance: Information on Expenditures and Proposals to Improve Effectiveness and Reduce Future Costs.* [GAO/T-RCED-95-140](#). Washington, D.C.: March 16, 1995.

*Federal Disaster Assistance: What Should the Policy Be?* PAD-80-39. Washington, D.C.: June 16, 1980.

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