



Shelter from the Superstorm

How Climate Preparedness and Resilience
Saves Money and Lives

By Cathleen Kelly and Jackie Weidman July 2013

Center for American Progress



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Introduction and summary

Americans across the country are already paying the price of (climate) inaction — in insurance premiums, state and local taxes, and the costs of rebuilding and disaster relief. ... And what we've learned from Hurricane Sandy and other disasters is that we've got to build smarter, more resilient infrastructure that can protect our homes and businesses and withstand more powerful storms. That means stronger seawalls, natural barriers, hardened power grids, hardened water systems, hardened fuel supplies. So the budget I sent Congress includes funding to support communities that build these projects, and this plan directs federal agencies to make sure that any new project funded with taxpayer dollars is built to withstand increased flood risk.

— President Barack Obama, June 25, 2013, speech at Georgetown University announcing his “Climate Action Plan”¹

Natural disasters leave communities devastated, often in desperate need of assistance to rebuild shattered homes and lives. As city leaders lay plans to repair broken bridges, roads, and hospitals in the aftermath of a storm, they have a rare moment to rethink the design of their communities and infrastructure and to rebuild with resilience to future storms in mind.² Without such foresight, city leaders risk inadvertently reconstructing electric grids, public transportation, and other critical infrastructure in ways that leave communities vulnerable to future storm damages.

Superstorm Sandy lashed the East Coast on October 29, 2012, devastating communities across the densely populated states of New York and New Jersey. The storm killed 147 people and damaged more than 650,000 homes.³ The Internal Displacement Monitoring Centre reported that Superstorm Sandy drove the third-largest number of people from their homes of all worldwide extreme weather events last year. In New Jersey alone 39,000 families are still displaced.⁴

While much of the debris from Sandy has been cleared away, the hard task of repairing and rebuilding the homes, schools, roads, bridges, hospitals, and other critical infrastructure still lies ahead. In the wake of Superstorm Sandy, New York City Mayor Michael Bloomberg (I-NY) is seizing the moment to call for new infrastructure and resilience projects. New York City leaders recently released a report commissioned by the mayor that pinpoints more than 250 steps the city should take to protect neighborhoods, infrastructure, and New Yorkers from the impact of superstorms, heat waves, droughts, floods, and other extreme weather driven by climate change.⁵ Supporting local climate preparedness and resilience building is a core aspect of President Obama's new national Climate Action Plan. When he announced the plan, he said, "we'll partner with communities seeking to help to prepare for droughts and floods, reduce the risk of wildfires, protect the dunes and wetlands that pull double-duty as green space and as natural storm barriers."⁶

Three months after Superstorm Sandy, Congress appropriated \$50.5 billion primarily for relief and recovery efforts in the Sandy-impacted region and increased the National Flood Insurance Program's borrowing authority by \$9.7 billion.⁷ In May Department of Housing and Urban Development Secretary Shaun Donovan gave the green light to New York state and New York City to begin spending \$1.77 billion in Sandy recovery assistance through Community Development Block Grants.⁸ Secretary Donovan also approved New Jersey's \$1.83 billion disaster recovery plan in April.⁹

As states and communities impacted by Sandy continue to develop their recovery plans, they have an opportunity to channel available disaster assistance into more resilient rebuilding strategies that will reduce the costs and damages of future extreme weather and climate change. Once reconstruction is complete, the window to redesign more resilient communities may not open again until another storm hits or the lifetime of newly constructed infrastructure expires.¹⁰ Federal agencies, President Obama's Hurricane Sandy Rebuilding Task Force, and state and city leaders have already taken initiative to support resilient rebuilding after Sandy. But more is needed at all levels of government.

Building on the president's Climate Action Plan, we recommend that federal, state, and local officials take the following four actions to rebuild better after Sandy and prepare for future superstorms:

- **Increase federal climate preparedness and resilience investments to save billions of dollars in disaster damages and costs.** Every dollar that the Federal Emergency Management Agency, or FEMA, invests in resilience and actions to reduce disaster losses saves the nation \$4 in disaster-recovery costs.¹¹ With the federal government domestic-disaster aid expenses totaling \$136 billion between 2011 and 2013, investing in resilience is a strategy we cannot afford to overlook.¹² In many cases, the federal government can increase its climate-preparedness investments simply by adding resilience requirements to existing federal grant programs, rather than waiting for new appropriations from Congress.
- **Make resilience a core aspect of all federal disaster assistance.** To avoid spending taxpayer dollars on rebuilding the same vulnerable structures over and over again, the Department of Housing and Urban Development—or HUD—FEMA, and other federal agencies should require that rebuilding projects supported by federal disaster assistance are resilient to extreme weather and other climate changes. Congress should amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act to assure that all FEMA-funded reconstruction is designed to better withstand future extreme weather and other climate-change impacts.
- **Increase community and infrastructure resilience.** President Obama should establish a national infrastructure resilience plan and investment strategy to more effectively leverage public and private capital to modernize and strengthen our nation's infrastructure.¹³ The president should also ensure that infrastructure grant programs within the Department of Transportation, HUD, the Army Corps of Engineers, and other agencies only support project designs that are disaster and climate resilient. Local officials and electric utilities should work together to build electricity-grid resilience by putting vulnerable power lines underground where possible, creating incentives for consumers to install smart meters, and distributing and decentralizing clean power around the grid so that communities are not as vulnerable to massive outages.¹⁴ State and local governments across the nation should develop sound hazard-mitigation and climate-change resilience plans, update building codes, and take other actions to reduce the consequences of future storms and climate change.

- **Give decision makers ready access to the climate-change risk information they need.** FEMA should accelerate its work to update nationwide flood maps to reflect increasing flood risks tied to sea-level rise, future superstorms, and other climate-change impacts. Congress and the president must ensure that FEMA has the necessary resources to make these rapid updates to keep people and property out of harm's way. Federal agencies producing coastal maps and providing climate services should also strengthen coordination to improve the accessibility and quality of climate information that communities need to improve their climate preparedness.

Without such steps, communities, businesses, and federal, state, and local governments risk investing Sandy recovery funds and future disaster aid in projects that continue to expose people, critical infrastructure, and local economies to the impacts of superstorms and climate change.

The new normal

For the first time in history, global concentrations of carbon pollution surpassed 400 parts per million on May 9, according to the National Oceanic and Atmospheric Administration, or NOAA.¹⁵ Scientists around the globe agree that we must limit greenhouse gases in the atmosphere to 450 parts per million or less by 2050 to avoid a 2 degree Celsius temperature increase and to dodge the worst impacts of climate change.¹⁶ If we continue down the path we are headed, however, this goal will be impossible to meet.

Americans have already been barraged with a growing number of deadly climate-related extreme weather events. In 2011 and 2012 the United States experienced 25 severe climate-related disasters that caused at least \$1 billion in damages each and a total of 1,141 fatalities, as reported by the National Oceanic and Atmospheric Administration.¹⁷ And these reported disaster losses are just the tip of the (melting) iceberg. The Heinz Center has documented how disaster losses are systematically underreported. Reported damages typically reflect public or private reimbursements for damaged structures but do not capture hidden costs such as losses due to business interruption, reduction in property values, interruption of social services, psychological trauma, and damage to natural systems, among others.¹⁸

In its Hurricane Season Outlook for 2013, NOAA forecasts that the number of severe weather events will rise well above the seasonal average. “This year, oceanic and atmospheric conditions in the Atlantic basin are expected to produce more and stronger hurricanes,” said Gerry Bell, lead seasonal hurricane forecaster with NOAA’s Climate Prediction Center. “These conditions include weaker wind shear, warmer Atlantic waters and conducive winds patterns coming from Africa.”¹⁹

Evidence of the new normal abounds. According to the draft National Climate Assessment, authored by 250 of the nation’s top scientists, academics, and business leaders:

*Climate change is already affecting the American people. Certain types of weather events have become more frequent and/or intense, including heat waves, heavy downpours, and, in some regions, floods and droughts. Sea level is rising, oceans are becoming more acidic, and glaciers and arctic sea ice are melting. These changes are part of the pattern of global climate change, which is primarily driven by human activity. ... These and other observed climatic changes are having wide-ranging impacts in every region of our country and most sectors of our economy.*²⁰

The report authors found that U.S. average temperature has risen by roughly 1.5 degrees Fahrenheit since 1895, with more than 80 percent of this increase occurring since 1980. The authors anticipate that U.S. temperatures will continue to rise by another 2 degrees to 4 degrees Fahrenheit in most areas over the next few decades. The authors also note that evidence of climate change has strengthened considerably since 2009, when the last assessment was penned. The report drew from long-term, independent records from weather stations, satellites, ocean buoys, tide gauges, and many other data sources.²¹ Another recent analysis revealed that, as the planet warms, the Greenland ice sheet is melting at a record speed and faster than predicted—90 percent of the ice-sheet surface disappeared in July 2012.²²

This growing body of climate-change evidence and the associated risks to public health, safety, and the economy make it more important than ever for communities, businesses, and governments to increase climate preparedness and resilience.

Why resilience matters

Superstorm Sandy wreaked havoc across New Jersey and New York, which together are home to roughly 9 percent of the American population and contribute more than 10 percent of the nation's gross domestic product.²³ According to the New Jersey rebuilding action plan prepared for HUD, "Data suggest that businesses in 113 of New Jersey's 565 municipalities incurred a combined \$382 million in commercial property losses and roughly \$63.9 million in business interruption losses."²⁴

In January 2013 the World Economic Forum identified the impacts of rising greenhouse-gas emissions and water-supply crises to be among the top five threats facing businesses today.²⁵ A different study commissioned by the same group found that 80 percent of companies are concerned about supply-chain resilience, and that business fears about extreme weather risks are rising sharply.²⁶ The study found that:

Global supply chains and transport networks form the backbone of the global economy, fuelling trade, consumption and economic growth. Disruptions to supply chains can prove costly, as highlighted most recently by Hurricane Sandy. According to research conducted by Accenture, significant supply chain disruptions have been found to cut the share price of impacted companies by 7% on average.²⁷

Adapting to this new normal involves adjusting our homes, communities, and infrastructure so that they can better withstand future extreme weather and climate change. FEMA calls such steps disaster mitigation, or taking action now “to reduce loss of life and property by lessening the impact of disasters.”²⁸ Communities and other systems are resilient when they are able to anticipate, prepare for, and “bounce back more strongly from stresses and shocks.”²⁹ By increasing climate preparedness and resilience to the growing risk of extreme weather and climate change, companies can keep their supply chains and profits intact despite an increase in extreme weather events.

State and local government action to build resilience

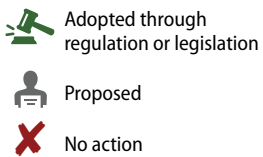
The areas most heavily impacted by Superstorm Sandy—Connecticut, New Jersey, and New York—are home to nearly 32 million people, hundreds of schools, and some of country’s most expansive public transportation systems.³⁰ In the wake of Sandy, state and local officials recognize that they must take action to protect communities and infrastructure from future storm damage.

Below, we track how decision makers in the Sandy-impacted region are considering climate preparedness and resilience as they rebuild after the storm. Many of these plans are still in the proposal stage, such as those recommended in New York City’s PlaNYC report and New York state’s NYS 2011 Commission report, with no guarantees that they will be implemented. Formally adopting these measures will protect people, schools, homes, and businesses from future extreme weather and other climate-change risks.

TABLE 1

Sandy-impacted cities and states work to protect themselves from future storms

Type of Protection	Resilience Projects	Connecticut	New Jersey	New York	New York City
Widespread flood and storm surge protection	Harden shorelines (seawalls, surge walls, levees, etc)				
	Restore and build up natural shoreline protection systems (dunes, wetlands)				
Protecting buildings & structures	Buy out properties that are vulnerable to future storms				
	Incentivize storm-proof repairs for homes and residential buildings				
	Elevate homes to protect against flood risk				
	Protective upgrades for municipal and other non-residential buildings				
	Increase energy efficiency through green building projects				
	Flood-proof hospitals				
Infrastructure	Strengthen and protect bridges, roads, rails, tunnels				
	Storm-proof drinking and waste water facilities				
	Expand sewer and drainage systems				
	Enhance water pumping systems in flood-prone areas				
	Secure hazardous waste and chemical tanks				N
	Storm-proof airport runways				
	Storm-proof cell towers				
Power systems	Harden and protect power systems				
	Elevate traffic signals				



Sources: state and city press releases and resilience plans – for full list see attached spreadsheet.

In the new normal of more intense and frequent extreme weather brought on by fossil-fuel-driven climate change, state and local governments are increasingly recognizing that building resilience saves lives and money. The state of New York has committed to programs that support resilient rebuilding. An initial \$259 million in grants, for example, will be available for home resilience projects, and \$171 million will be available for voluntary buyouts for homeowners in flood-prone areas.³¹ New York also plans to restore and protect wetlands and use other natural infrastructure where possible to reduce flood risks.³² New York and Connecticut jointly established a Sustainable Communities Consortium to support long-term planning for climate resilience across both states.³³

At a Clinton Global Initiative event on June 13, Gov. Chris Christie (R-NJ) endorsed the value of investing in resilient communities. Gov. Christie said, “To invest \$3 or 4 billion, to try to prevent another \$39 billion in losses, or mitigate it? It seems to me to be, whether you’re a Republican or a Democrat, a pretty smart investment to make for the country.”³⁴ Gov. Christie plans to spend \$300 million in federal funds to buy out Sandy-damaged homes owned by willing sellers.³⁵ This buyout initiative is less ambitious than recommended by in-state experts, however, and it is uncertain whether it will focus on properties that are most at risk of future storm damage.³⁶

To improve resiliency to power outages in Hoboken, New Jersey, city leaders are partnering with the U.S. Department of Energy, the New Jersey Board of Public Utilities, and the Public Service Enterprise Group—commonly known as PSE&G—to design a more resilient electricity grid to help keep the power on during and after storms. The partnership will explore options for using advanced, smart-grid technologies and distributed and renewable energy to improve grid reliability and resiliency.³⁷

New York Gov. Andrew Cuomo (D-NY) tasked a New York state commission of senior business and policy leaders to make recommendations on how to improve the resilience of the state’s infrastructure to future severe weather.³⁸ The commission’s January 2013 report details a striking reality laid bare by Superstorm Sandy’s destruction:

We live in a world of increasing volatility, where natural disasters that were once anticipated to occur every century now strike with alarming regularity. Our response capabilities to this new level of instability and the ability to bounce back stronger must be developed and strengthened. Our efforts must be rooted in robust

*structural underpinnings as well as expanded operational capacities. Superstorm Sandy made the urgency of this undertaking painfully clear. We also now possess a vastly deeper understanding of our current vulnerabilities. We cannot just restore what was there before—we have to build back better and smarter.*³⁹

Weeks after the storm, Mayor Bloomberg launched a Special Initiative for Rebuilding and Resiliency, which released a report on June 11 that details 250 recommendations for a broad range of resilience actions—including protective flood barriers and levees, a resiliency incentive program for homeowners, flood protections for health care facilities, and strengthening utilities and water systems to better withstand future extreme weather and climate change.⁴⁰ In the appendix we offer more information on these and other steps that New York, New Jersey, and Connecticut are taking to build climate preparedness and resilience.

On June 17, 45 local elected officials made commitments to create more resilient cities, towns, and counties by taking action to support climate preparedness, energy security, infrastructure renewal, and economic competitiveness. In addition to taking on these commitments, which are outlined in a Resilient Communities for America Agreement, these local officials have called for more federal action and support.⁴¹

Cities and states impacted by Superstorm Sandy are not alone in taking steps to reduce risks tied to climate-related extreme weather. As of December 2012, 15 states had resilience plans and four more were in the process of developing them.⁴² A May 2013 Government Accountability Office, or GAO, study reveals that states and cities across the United States want help from the federal government to prepare and reduce the rising public health and safety risks of more extreme weather and climate change. The GAO found that local decision makers consumed with managing aging infrastructure often do not have the time, resources, or necessary information to consider options to build resilience to extreme weather and climate change. Only when responding to a disaster and given access to the right information and expertise are they able to factor these risks into their planning.⁴³

As community, business, and policy leaders develop their plans to rebuild after Superstorm Sandy, they have an immediate opportunity to invest available disaster assistance in improving community resilience rather than locking into status quo infrastructure and buildings that are vulnerable to future disasters. Without such investments, these structures will continually need to be rebuilt with federal assistance in the wake of the next disaster and will be financed by taxpayers across the country.

Federal actions to build resilience

Federal policymakers are increasingly recognizing that resilience to extreme weather and climate change helps keep communities safe and supports economic growth. The president's national Climate Action Plan details his commitment to cut U.S. carbon pollution, prepare the nation for the impacts of climate change, and lead international efforts to combat climate change. The plan indicates that:

... the president will direct federal agencies to identify and remove barriers to making climate-resilient investments and policies; identify and remove counterproductive policies that increase vulnerabilities; and encourage and support smarter, more resilient investments, including through agency grants, technical assistance, and other programs, in sectors from transportation and water management to conservation and disaster relief.⁴⁴

The president will establish a task force of state, local, and tribal leaders to identify needed federal actions to support climate preparedness in communities.⁴⁵

President Obama's Executive Order 13514 requires federal agencies to develop yearly sustainability-performance plans and build resilience to climate-change risks in communities and within their own programs and operations.⁴⁶ The president also called on the interagency Climate Change Adaptation Task Force to develop recommendations for federal actions to increase the nation's climate preparedness and resilience.⁴⁷

The Department of Homeland Security, or DHS, which houses FEMA, joined other federal agencies in February 2013 in releasing plans to build resilience to climate change.⁴⁸ The DHS plan includes 17 actions to reduce climate-change risks to infrastructure and communities.⁴⁹ That same month, the GAO flagged climate change as a top threat to federal property, infrastructure, and other government assets, as well as an oversized liability for federal crop and flood-insurance programs.⁵⁰

In December 2012 President Obama established the Hurricane Sandy Rebuilding Task Force to work with state and local governments and key stakeholders to develop a rebuilding plan that will help the communities hit by Sandy emerge more resilient to future extreme weather and climate change.⁵¹ The task force also provides technical assistance to communities as they rebuild and improves coordination across federal agencies as they deliver Sandy disaster aid.⁵²

In April 2013 the Sandy Rebuilding Task Force established a new flood-risk elevation standard that will ensure that all substantial rebuilding projects funded by Sandy recovery aid can better withstand future superstorms.⁵³ With this standard in place, reconstruction projects funded by the Sandy supplemental-funding bill must now elevate their bottom floor or otherwise flood proof at least one foot above FEMA's most recent flood-risk guidance. Many communities in the region have already adopted this standard, including the entire state of New Jersey.⁵⁴

The president's Climate Action Plan indicates that:

*... to ensure that projects funded with taxpayer dollars last as long as intended, federal agencies will update their flood-risk reduction standards for federally funded projects to reflect a consistent approach that accounts for sea-level rise and other factors affecting flood risks.*⁵⁵

This work will build on the new flood-risk elevation standard set by the Sandy Rebuilding Task Force.⁵⁶

In addition, HUD requires applicants for the \$5.4 billion in Community Development Block Grant Disaster Recovery Program, or CDBG-DR—which is available to areas hit hardest by Sandy—to provide action plans describing how their rebuilding projects will be resilient to sea-level rise and future superstorms.⁵⁷ If desired, grantees can use these funds to buy commercial and residential properties that are vulnerable to future extreme weather and climate change and then convert them into parks or natural areas.⁵⁸

While these are important steps toward integrating climate-related resilience into disaster recovery, they are not final solutions for a number of reasons. First, with agencies directed in the Climate Action Plan to encourage more resilient investments through grant programs, HUD should apply its new CDBG-DR resilience requirements to all CDBG grants, not just the \$5.4 billion for communities hit hardest by Sandy. Other federal agencies should also adopt this requirement. Second, it is unclear if or how HUD will firmly hold grantees to the new CDBG-DR requirement. Third, when the task force mandate expires in August 2013, it is unclear if or how current efforts to infuse climate resiliency into disaster recovery will continue.

Talk is cheap

Recovery efforts in New Jersey provide a glimpse at how good intentions do not necessarily translate into real action without some level of oversight. New Jersey's CDBG-DR action plan was critiqued by New Jersey Future—a nonprofit promoting responsible land management—for not adequately addressing flood risks tied to sea-level rise, as required by HUD.⁵⁹ Yet HUD still approved New Jersey's plan even though it did not address these issues.

There have also been some early indications that speeding up rebuilding efforts is a higher priority than increasing resilience to future storms. State permit requirements for restoring roads and other public infrastructure, for example, have been removed by administrative order under the governor's state-of-emergency authorities. Without the opportunity to revisit the design and location of roads and other infrastructure, which the state permitting process supports, these structures are at greater risk of being damaged yet again by the next storm. In addition, all land-use decisions are made by New Jersey's 565 municipalities, many of which have little knowledge about flood-resilience best practices.

The New Jersey Department of Environmental Protection, or DEP, also handed over to local officials some key rebuilding oversight responsibilities, including ensuring that reconstruction projects comply with the National Flood Insurance Program, or NFIP, and the New Jersey Flood Hazard Area Control Act—a 2007 measure that set standards for rebuilding in flood-hazard areas.⁶⁰ This has put a lot of pressure on local officials, many of whom have not been trained on the NFIP's flood-proofing requirements, some of which are more stringent than those adopted by the New Jersey DEP.

By stripping down NFIP compliance oversight, there is a risk that federal disaster assistance financed by taxpayers will support reconstruction in New Jersey that does not meet federal rules. If this occurs, some policyholders in New Jersey could face higher flood insurance premiums, or in the worst case, communities could be suspended from the NFIP. Some state experts are also concerned about the lack of transparency in planning the New Jersey rebuilding process, which has been centralized in the governor's office, and the absence of a state or regional climate preparedness and resilience plan.⁶¹

If New Jersey cuts corners on increasing the resilience of its vulnerable coastline, New Jersey residents, as well as taxpayers nationwide, will unfortunately pay the

price. Between January 1978 and April 2013, the NFIP paid a total of \$5 billion in flood-loss claims to New Jersey, putting the state ahead of Florida and third only to Texas and Louisiana in the total value of flood-loss claims paid by the NFIP.⁶² This is astonishing given that New Jersey’s population is less than half that of Florida, and that New Jersey is the fifth-smallest U.S. state in terms of total square miles.⁶³

TABLE 2
National Flood Insurance Plan payouts
from January 1978 through April 2013

Top five state recipients of NFIP funding	Total flood claim loss (in billions of dollars)
Florida	\$3.7
Louisiana	\$16.6
New Jersey	\$5
New York	\$4.6
Texas	\$5.3

Source: FEMA’s National Flood Insurance Plan Loss Statistics, 1978 to April 2013 (available at <http://bsa.nfipstat.fema.gov/reports/1040.htm>).

An ounce of prevention is worth a pound of cure

The National Institute of Building Sciences estimates that every dollar invested in building resilience and reducing exposure to disaster risks saves \$4 in disaster response and recovery.⁶⁴ Finding data on what the federal government spends on resilience and disaster mitigation relative to standard disaster recovery and relief is not easy. A recent CAP analysis estimates that the federal government spent a total of roughly \$22 billion on resilience in 2011, 2012, and 2013.⁶⁵ This does not include the \$13 billion intended for resilience activities under the Sandy Relief Act. Rep. Earl Blumenauer (D-OR) and CAP have called on federal agencies to provide an accurate and comprehensive account of federal disaster spending. Improved accounting and transparency would help Congress and the administration make sound decisions on extreme weather resilience and recovery investments.⁶⁶

Based on FEMA spending estimates during the past several years, we found that FEMA invests roughly 80 percent less in resilience and hazard mitigation than in disaster relief and recovery. (see table below) FEMA invested an average of \$1.1 billion in disaster resilience annually between 2011 and 2013. Using the \$1 invested to \$4 saved ratio, FEMA's \$1.1 billion investment in resilience yielded \$4.4 billion in nationwide benefits every year. If the agency had doubled this yearly investment, it could have reduced annual disaster costs by an additional \$4.4 billion nationwide.⁶⁷

TABLE 3
FEMA’s projected costs for disaster relief compared
to disaster-mitigation projects (in billions of dollars)

	Disaster assistance	Pre-disaster mitigation and resilience
2011	\$5.5	\$1.4
2012	\$1.3	\$0.4
2013	\$8.5	\$1.4
Annual average	\$5.1	\$1.1

Note: Disaster assistance does not include hazard-mitigation grants or administrative costs. Disaster-mitigation grant programs include predisaster mitigation grants; hazard-mitigation grants; flood-hazard mapping and analysis; flood-mitigation grants through the National Flood Insurance Program; fire-management assistance; and national dam safety.
Source: Federal Emergency Management Agency Annual Budget Reports.

Moreover, instead of increasing federal investments in resilience through the Pre-Disaster Mitigation Fund, congressional appropriations to FEMA for this program have fallen by nearly 30 percent from \$50 million in 2011 to \$36 million in 2012.⁶⁸

Resilience roadblocks

Insufficient financing is a common barrier to building resilience to extreme weather and climate change. In addition, local decision makers often do not have ready access to information on their extreme weather and climate-change risks, making it difficult to develop smart infrastructure and community resilience plans.⁶⁹

In the past, state and local decision makers have also encountered significant roadblocks when attempting to direct federal disaster aid to build more resilient infrastructure. It has been nearly two years since Tropical Storm Irene drove crippling floods throughout Vermont, killing three people and causing roughly \$250 million in damages, yet the state has had difficulty securing federal disaster assistance from FEMA to cover the cost of building better, more storm-ready water culverts.⁷⁰ Prior to important reforms to the Public Assistance Program under the Stafford Disaster Relief and Emergency Assistance Act included in the Sandy Relief Act, FEMA had limited ability to reimburse state and local governments for rebuilding costs beyond those tied to replacing exactly what existed prior to the disaster. FEMA is at the early stages of implementing the Stafford Act reforms, and the new provisions—which are described below—only apply if grant applicants elect to follow “alternative procedures.”⁷¹ In other words, not all public assistance projects will reap the benefits of FEMA’s new authorities to support climate preparedness and resilience.

A look inside the Sandy Relief Act

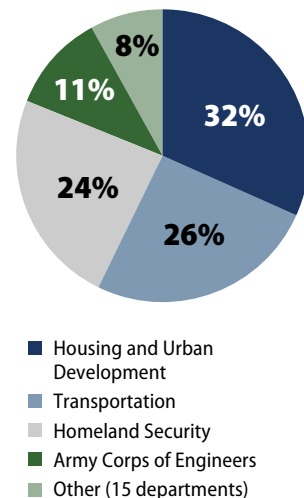
The January 2013 Disaster Relief Appropriations Act, more commonly referred to as the Sandy Relief Act, made available \$50.5 billion to state, local, and federal agencies, primarily to recover and rebuild after the devastation of Superstorm Sandy.⁷² Congress also increased the National Flood Insurance Program’s borrowing authority by \$9.7 billion.⁷³ With federal budget talks at an impasse in Washington and automatic budget cuts—also called sequestration—in effect, the \$50.5 billion Sandy aid package has shrunk by \$2.5 billion to a new total of \$47.9 billion.⁷⁴

TABLE 4

Hurricane Sandy relief funding distribution, by department

Agency/department	Funding, before the sequester (in millions of dollars)	Funding, after the sequester (in millions of dollars)
Housing and Urban Development	\$16,000	\$15,200
Transportation	\$13,070	\$12,417
Homeland Security	\$12,072	\$11,468
Army Corps of Engineers	\$5,350	\$5,083
Interior	\$829	\$788
Small Business	\$805	\$765
Health and Human Services	\$800	\$760
Environmental Protection	\$608	\$577
Commerce	\$326	\$ 311
Veterans Affairs	\$236	\$236
Agriculture	\$228	\$217
Defense	\$113	\$104
Labor	\$25	\$24
Justice	\$21	\$20
National Aeronautics and Space	\$15	\$14.3
General Services	\$7	\$6.7
Smithsonian	\$2	\$1.9
Social Security	\$2	\$ 2
Legal Services	\$1	\$0.95
Total	\$ 50,509.7	\$ 47,993.7

Source: The Sandy Relief Act; Office of Management and Budget 2013 Report to the Congress on the Joint Committee Sequestration for Fiscal Year 2013.



Using Superstorm Sandy relief aid to rebuild more resilient communities

Division B of the Sandy Relief Act includes the Sandy Recovery Improvement Act of 2013, which creates several new opportunities for state and local governments to rebuild safer and more resilient and sustainable communities.⁷⁵ The law allows states, for example, to use disaster assistance from EPA—\$500 million under the Federal Water Pollution Control Act’s Clean Water State Revolving Funds and \$100 million under the Safe Drinking Water Act—to increase the resilience of wastewater and drinking-water facilities impacted by Sandy. Congress explicitly authorized the use of these funds to upgrade facilities to “enhance resiliency to rapid hydrologic change or natural disaster.”⁷⁶ The law also requires the Army Corps of Engineers to conduct a comprehensive study of flood risks to vulnerable coastal populations in areas impacted by Sandy.

The Sandy Relief Act includes some important changes to the Stafford Disaster Relief and Emergency Assistance Act that allow FEMA to support more resilient rebuilding. The reforms, for example, remove a 10 percent financial penalty charged to grant recipients if they opt to invest federal assistance in alternative rebuilding strategies, including more resilient infrastructure and public facilities, rather than simply repairing or replacing the previous structure. This reform was inspired in part by the challenges that New Orleans faced when rebuilding after Hurricane Katrina. In addition, the Stafford Act reforms in the Sandy Relief Act allow state and local governments to receive upfront grants based on estimated costs to rebuild rather than wait for cost reimbursements.⁷⁷ The Sandy Relief Act also accelerates the review process for hazard-mitigation projects and requires FEMA to develop recommendations to Congress by July 30, 2013, on the development of a national strategy to reduce damages from future extreme weather.⁷⁸

While the Sandy Relief Act delivered some important reforms that allow the federal government to help build community resilience after disaster strikes, even more action is needed to reduce the risks of extreme weather and climate change to public health and safety and the economy.

Needed action to build resilience and tackle climate change

The best strategy to tackle climate change is to cut carbon pollution from fossil-fuel energy consumption and other sources. In 2009 President Obama pledged to meet a 2020 greenhouse-gas reduction goal of 17 percent below 2005 emission levels.⁷⁹ The Environmental Protection Agency estimates that U.S. emissions in 2011 were 7 percent below 2005 levels.⁸⁰ The president's Climate Action Plan lays out a comprehensive suite of tools to deal with this challenge. The plan, most significantly, directs EPA "to work expeditiously to complete carbon pollution standards for both new and existing power plants." Completion of the carbon-pollution standard for existing plants should occur by 2015 so that implementation can begin during this administration.⁸¹

Even if we make rapid progress on slashing carbon and other climate pollution, extreme weather and other climate-change impacts are already underway. With Sandy recovery efforts in full swing, federal, state, and local governments have an immediate opportunity to make smart investments that will protect people from future climate impacts. Federal, state, and local officials must take the following four actions to rebuild better and smarter.

Increase federal investments in resilience to save billions in disaster response

By underinvesting in resilience today, we risk facing even higher disaster relief and recovery costs in the future. Congress and the administration should increase federal investments in smart resilience and risk-reduction strategies before and after a disaster hits.

Congress could offset an increase in federal resilience investments by reducing fossil-fuel subsidies, establishing and using the revenues from a carbon tax, and increasing the royalty rate for private production of coal, oil, and natural gas on federal lands, among other options.⁸² Reps. Lois Capps (D-CA), Frank Pallone

(D-NJ), Henry Waxman (D-CA), and 37 of their colleagues have urged President Obama to appoint a bipartisan blue-ribbon panel to develop a plan to help communities prepare for extreme weather and climate change and to recommend “a dependable revenue stream to provide additional resources for local pre-disaster mitigation planning.”⁸³

Make resilience a core aspect of all federal disaster assistance

Building on the momentum of the president’s new Climate Action Plan and the Sandy Relief Act reforms to federal disaster assistance, Congress must further amend the Stafford Disaster Relief and Emergency Assistance Act to require that all FEMA-funded rebuilding and recovery projects be designed to better withstand future extreme weather and climate change. As it stands, the Stafford Act and Sandy Relief Act rely primarily on the political will and initiative of federal disaster aid recipients to rebuild resilient communities and infrastructure. Until such reforms occur, FEMA Administrator Craig Fugate should use his existing authority to strongly encourage state and local officials to mitigate future disaster risks and rebuild more resilient public facilities, especially when taxpayers are paying the disaster recovery bill.⁸⁴ According to a new analysis by the Georgetown Climate Center, FEMA and the Department of Transportation have yet to fully tap their existing authorities to support smarter, more resilient rebuilding strategies in the wake of disasters.⁸⁵

In addition, HUD should hold grantees to the new resilience requirement it created for Community Development Block Grants for disaster recovery efforts in areas hit hardest by Sandy. Otherwise, grantees may simply check the resilience box on their applications without actually implementing the measures described in their action plans. HUD should apply and enforce these requirements for all Community Development Block Grant disaster recovery assistance, or CDBG-DR.

The Department of Transportation, the Army Corps of Engineers, and other agencies should add resilience and climate preparedness requirements to existing federal grant programs that support disaster recovery so that all projects receiving federal disaster assistance are built to weather future storms, sea-level rise, and other climate change impacts.

FEMA should also invest in more training for its staff on the ground so that they fully understand FEMA’s existing authorities to support rebuilding communities and infrastructure to be more resilient to future extreme weather, including new opportunities opened up by the Sandy Relief Act.

Lastly, the federal government should continue efforts to more effectively coordinate with and support state and local governments during disaster recovery, as outlined in the National Disaster Recovery Framework.⁸⁶ As described in the president's Climate Action Plan, "the Administration will launch a cross-agency National Drought Resilience Partnership as a 'front door' for communities seeking help to prepare for future droughts."⁸⁷ Federal agencies involved in other disaster recovery efforts must also strengthen coordination to ensure they provide the expertise and support that communities need.

Increase the resilience of communities, electricity grids, and other infrastructure

The federal government needs a national infrastructure resilience plan that creates a comprehensive investment strategy to more effectively leverage public and private capital to modernize and strengthen our nation's infrastructure. The national plan must also include an assessment of infrastructure vulnerability to climate-change impacts and create a cabinet-level council to strengthen federal infrastructure partnerships between state and local governments and the private sector.⁸⁸

The president's Climate Action Plan describes a FEMA-Department of Energy partnership with the private sector to improve the resilience of the electric power system and fuel supplies.⁸⁹

The president should also direct DOT, HUD, the Army Corps of Engineers, EPA, and other agencies with infrastructure grant programs to only support project designs that are disaster and climate resilient. The Department of Transportation, for example, should make resilience a requirement for all TIGER Discretionary Grants—which help to improve our nation's infrastructure that make communities more livable and sustainable. Doing so would ensure that those investments build storm-ready roads, rails, transit systems, and ports. With nearly \$500 million appropriated by Congress for such grants in both 2012 and 2013, making resilience a grant requirement would have a significant impact on improving the safety and longevity of our nation's infrastructure.⁹⁰

HUD should similarly add climate preparedness and resilience requirements for all Community Development Block Grants, or CDBG. Congress appropriated \$3.5 billion, \$3 billion, and \$3.1 billion for this program in 2011, 2012, and 2013, respectively.⁹¹

State and local governments across the nation must also take action to reduce the risks of future superstorms and climate change to critical infrastructure. State and federal policymakers can work with utilities to build electricity-grid resilience by putting vulnerable power lines underground where possible, creating incentives for consumers to install smart meters, and distributing and decentralizing clean power around the grid so that communities are not as vulnerable to massive outages.⁹² The Recovery Act's investment in smart grid technology, for example, has helped deploy 12 million smart meters so far.⁹³

Local officials should develop sound hazard-mitigation and climate-change resilience plans, update building codes, and take other actions to reduce the risks of future superstorms and climate-change effects. To support these steps, the president's Climate Action Plan directs the National Institute of Standards and Technology to "convene a panel on disaster-resilience standards to develop a comprehensive, community-based resilience framework and provide guidelines for consistent safe buildings and infrastructure."⁹⁴

The federal government can also work with partners to strengthen incentives for climate resilience innovation. HUD Secretary and Sandy Rebuilding Task Force Chair Shaun Donovan recently announced the Rebuild by Design competition to spark innovation in climate preparedness and resilience in the Sandy-affected region. According to HUD, "The competition will have a region-wide focus to help provide solutions to problems that are larger or more complex than individual towns have the capacity to solve themselves."⁹⁵ Winning solutions could range from large-scale green infrastructure to small residential resilience upgrades. HUD will incentivize the implementation of the winning designs with Community Development Block Grant Disaster Recovery funds.⁹⁶

Give decision makers ready access to the climate-change risk information they need

The federal government must do more to provide state and local decision makers with the information they need to understand the risks of more extreme weather and climate change. More accurate and up-to-date maps allow families, businesses, local policymakers, and planners to make smart decisions to keep people and property out of harm's way. In coastal areas these maps should include erosion, relative sea-level rise, future superstorms, and other climate-change impacts.

Congress gave FEMA the authority to update its floodplain maps to account for sea-level rise as part of the 2012 National Flood Insurance Program reforms.⁹⁷ Congress recognized that including these updates in the floodplain maps is essential to ensure the solvency of the flood insurance program, which is now \$21 billion in debt after Superstorm Sandy.⁹⁸ FEMA is in the process of updating and digitizing the floodplain maps for many communities to incorporate updated flood data and higher-resolution topographical data.

FEMA was working on such an update for New York and New Jersey when Superstorm Sandy hit. In June 2013 FEMA rolled out New York City's new "preliminary" flood-insurance maps. The new maps double the number of city structures in flood zones to more than 67,000, as compared to the previous maps that relied on data from 1983.⁹⁹ In the same month FEMA also released a study by independent contractor AECOM Technology Corporation that revealed that rising seas and more extreme weather are expected to expand the areas of the country vulnerable to flooding by up to 45 percent by 2100. These changes could double the number of flood-prone properties nationwide that are covered by the National Flood Insurance Program and drive up flood losses by 90 percent.¹⁰⁰

Despite these new pressures to update floodplain maps, FEMA's budget for its Flood Hazard Mapping and Risk Analysis program dropped from \$181.6 million in 2011 to \$97.7 million in both 2012 and 2013.¹⁰¹ Congress and the president must ensure that FEMA is given the resources it needs to update flood maps so that they reflect increasing flood risks tied to sea-level rise, future superstorms, and other climate-change impacts. The president should also require that all agencies producing coastal maps—including FEMA, the Army Corps, the U.S. Geological Survey, NOAA, and the Natural Resources Conservation Service—coordinate and integrate their maps where appropriate. Doing so would better leverage expertise across the agencies, improve the quality of our nation's coastal maps, and help communities improve their climate preparedness.

In addition, spending cuts enacted by Congress are undermining NOAA's ability to deliver lifesaving hurricane forecasts and to monitor future storms. In 2011 NOAA requested \$910 million for its Joint Polar Satellite System to provide data for weather forecasts, search-and-rescue operations, and climate-change research. Congress ultimately approved just \$382 million for the program.¹⁰²

Lastly, highly demanded climate-change services and support for resiliency planning provided by NOAA, the Department of the Interior, the Department of Agriculture, and other agencies should be expanded and better coordinated. The president's Climate Action Plan outlines federal steps to address these needs. The Department of Agriculture, for example, "is creating seven new Regional Climate Hubs to deliver tailored, science-based knowledge to farmers, ranchers and forest landowners."¹⁰³ Federal agencies will also create a "virtual climate resilience toolkit that centralizes access to data-driven resilience tools, services and practices."¹⁰⁴

In addition, NOAA has been working to ensure that every coastal state and local entity that receives federal funds to protect or restore coastal resources has a climate preparedness and resilience strategy. In fiscal year 2011 NOAA attempted to centralize federal support to build community resilience through a NOAA Climate Service, but Congress ultimately blocked this plan.¹⁰⁵ The president should revisit NOAA's proposed Climate Service or assign an agency lead in each region to streamline state and local decision-maker access to essential climate information and resilience-planning support.

Conclusion

These and other actions to build climate preparedness and resilience and to reduce emissions are essential to ensure that communities, families, and businesses are not left vulnerable to excessive superstorm damages and health and safety risks. Building stronger, more resilient infrastructure, public facilities, and homes is simply common sense and will help lower the cost of future disaster relief and recovery. Embracing this cost-effective approach to post-Sandy rebuilding will not only benefit the communities impacted by the superstorm, but will also lay the groundwork for investing future disaster-recovery assistance and infrastructure financing in building resilient communities across the country.

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