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Pound Foolish

Federal Community-Resilience Investments Swamped by Disaster Damages

By Daniel J. Weiss and Jackie Weidman June 19, 2013

"We can do nothing and expose ourselves to an increasing frequency of Sandy-like storms that do more and more damage ... Or, we can make the investments necessary to build a stronger, more resilient New York—investments that will pay for themselves many times over in the years to come." — New York City Mayor Michael Bloomberg (I), June 11, 2013[1]

"To invest $3 billion to $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." — Gov. Chris Christie (R-NJ), June 14, 2013[2]

Seven months after the second most costly hurricane in history, Mayor Bloomberg proposed investing $19.5 billion to make his city much more resilient to future extreme weather events.[3] More than one-quarter of these resources will come from federal funds included in the Disaster Relief Appropriations Act, which provides aid to New York, New Jersey, and other affected states to help them recover from Superstorm Sandy.[4] New Jersey is also investing significant portions of its Superstorm Sandy federal aid in resilience efforts, particularly along the Jersey Shore.[5] These investments will make New York and New Jersey homes, businesses, infrastructure, and coastal areas more resistant to damage from future storms, sea-level rise, and other climate-change impacts.

Unlike New York City and New Jersey, many communities lack the financial resources to become more resilient to future extreme weather events, and the federal government woefully underfunds such resilience needs. This CAP analysis estimates that the federal government spent a total of only $22 billion on general resilience efforts from fiscal year 2011 to fiscal year 2013. The Obama administration requested an additional $13 billion for mitigation efforts in Connecticut, New Jersey, and New York after Superstorm Sandy, but it is difficult to determine the actual mitigation spending from this sum.[6] (see text box) The federal government does not have a comprehensive tally of its spending for community resilience and other pre-disaster mitigation programs.

A previous CAP analysis estimated that the federal government spent $136 billion—or nearly $400 per household annually—on disaster relief and recovery from FY 2011 through FY 2013.[7] Based on those figures, federal taxpayers spent nearly $6 for disaster recovery for every $1 spent to increase general community resilience over the past three years.

We must help communities enhance their ability to withstand the high winds, flood waters, scorching heat, searing wild fires, and parched earth from extreme weather. Every $1 invested in such "pre-disaster mitigation," or resilience measures—which help communities withstand the effects of extreme weather—reduce the cost of damage from these extreme weather events by $4, according to a study for the Federal Emergency Management Agency, or FEMA.[8]

Costly extreme weather continues in 2013

The severe, extreme weather during the past two years exacted a significant human and economic toll. From the start of 2011 through the end of 2012, there were 25 extreme weather events that caused at least $1 billion each in damage, with a total tab for destruction of $188 billion and 1,100 fatalities.[9]

Although extreme weather continues in 2013, the National Oceanic and Atmospheric Administration, or NOAA, has yet to identify any $1 billion damage events this year.[10] Insurance broker AON Benfield estimates, however, that there were three weather events that each caused at least $1 billion in economic losses thus far this year.[11] The costliest of these events were the Oklahoma tornados, which caused 24 fatalities in mid-May and an estimated $5 billion in damages.[12]

Extreme weather will likely continue throughout 2013. The National Oceanic and Atmospheric Administration predicts an "active or extremely active [hurricane] season this year … [that is] well above the seasonal average."[13]

The New York Times additionally reports that, "just over 44 percent of the country remains in drought."[14] NOAA predicts a continued persistent drought this summer through most of the southwestern United States.[15] This could lead to significant economic damage from wildfires, as well as continued harm to the farm economy.

Resilience technologies can be costly

The Presidential Policy Directive 8, or PPD-8, for national preparedness defines "mitigation" as:

> *Those capabilities necessary to reduce loss of life and property by lessening the impact of disasters. Mitigation capabilities include … community-wide risk reduction projects; efforts to improve the resilience of critical infrastructure and key resource lifelines; risk reduction for specific vulnerabilities from natural hazards or acts of terrorism; and initiatives to reduce future risks after a disaster has occurred.*[16]

Mitigation means adapting buildings, infrastructure, and natural systems that will allow communities to better withstand high winds and rain, ocean storm surge, unusually high temperatures, wild fires, and drought.

The technologies needed to accomplish this goal vary in cost and complexity. The St. John's Regional Medical Center in Joplin, Missouri, for instance, was essentially destroyed by a tornado in 2011 and has been rebuilt with a tornado-proof design that includes windows that can resist winds of up to 250 miles per hour at a cost of $170 per square foot—$70 more per square foot than standard windows.[17] The cost of including a safe room designed to protect people from tornados in the construction of a new home can cost $8,000, and it costs about $10,000 to add to an existing home.[18] (see attached spreadsheet for list of resilience technologies and cost)

Several coastal Texas cities that are vulnerable to hurricanes recently invested in community shelters to protect their residents. Edna, Texas, built a $2.5 million hurricane shelter large enough to shield the town's 5,500 residents from winds up to 300 miles per hour.[19] The shelter also doubles as a high-school gymnasium. FEMA paid for 75 percent of it, and it plans to invest $683 million in similar shelters in 18 other states.[20]

New York and New Jersey are buying out homeowners with severely damaged homes located in flood-prone areas using federal funds provided under the Disaster Relief Act.[21] This resilience measure is expensive and something many coastal communities cannot afford to undertake on their own.

Resilience spending saves taxpayers money but federal investments lag

Many communities lack the resources to invest in projects that would protect their structures and inhabitants from major storms. Superstorm Sandy, for instance, damaged two-thirds of the downtown homes and businesses in Highlands, New Jersey. Local officials there told NBC News that they had previously considered resilience measures—such as raising the height of the town—but that construction costs were prohibitively expensive.[22]

A similar lack of financial resources prevented other communities from adequately investing in resilience. In the wake of the tornados in Moore, Oklahoma, *The New York Times* reported that, "only about 10 percent of homes in Moore" had storm-safe rooms or underground shelters.[23] And *The Wall St. Journal* reported that efforts to build safe rooms in local schools were also limited by the lack of federal assistance. According to *The Journal*, "Local officials said Tuesday [May 21, 2013] that about 100 schools in the state are equipped with safe rooms that were built with federal funds. The money had dried up in past years, officials said, and many schools were on a waiting list."[24]

Joplin, Missouri, which was flattened in 2011 by the deadliest tornado since 1950, had previously applied for FEMA funds to build safe rooms.[25] *The New York Times* reported that the "state used money from the Federal Emergency Management Agency primarily for disaster relief from flooding."[26]

Federal resilience spending lags far behind disaster relief

A CAP review of federal resilience spending in FY 2011 through FY 2013 identified 43 programs in seven cabinet departments that invest in extreme weather resilience efforts. This total includes $12 billion—or more than half of all resilience spending—for a number of the Department of Agriculture programs designed to increase sustainable agriculture and to also provide additional protection for agricultural water supplies from the impact of floods and droughts.

Funding for federal resilience programs, FY 2011 to FY 2013

Department	Number of programs	Total Spending FY 2011-13, billions of dollars
Agriculture	15	$12
Commerce	2	$1.9
Department of Defense	4	$3.2
Environmental Protection Agency	5	$0.2
Health and Human Services	1	$0.02
Homeland Security	7	$3.2
Interior	9	$1.9
Total	**43**	**$22.4**

Note: Figures are rounded.
Source: Departments' FY 2011 to FY 2013 budget summaries.

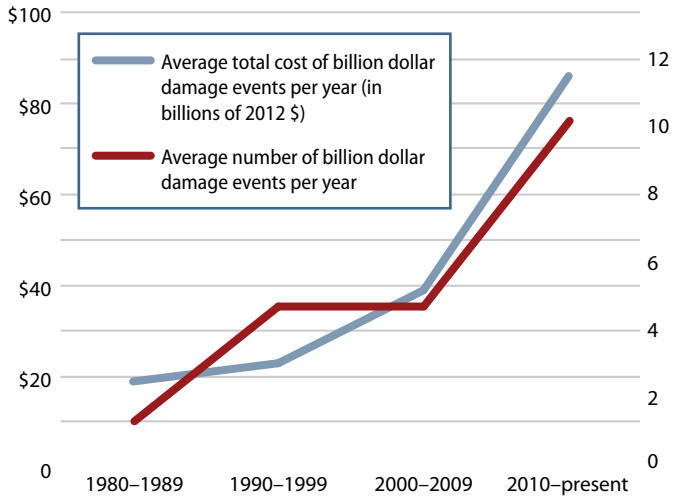
From FY 2011 to FY 2013, our analysis identified only $10 billion in federal resilience programs not related to the U.S. Department of Agriculture. This includes an estimated $2.2 billion for the Hazard Mitigation Grant Program that "provides the opportunity to take critical mitigation [resilience] measures to reduce future loss of life and property during the reconstruction process following a disaster." This program is part of FEMA's Disaster Relief Fund and makes sure federal grants are available to communities that received a presidential disaster declaration. The projects must demonstrate that they will reduce long-term risks.

Other FEMA resilience programs include the Pre-Disaster Mitigation Fund and the National Flood Insurance Program. The Pre-Disaster Mitigation Fund provides grants to states and local governments to implement resilience projects.[27] The National Flood Insurance Program funds resilience through mitigation projects that increase resiliency to floods.[28]

Extreme weather events on the rise

The number and cost of the most damaging extreme weather events have grown over the past three decades, according to NOAA. In the 1980s there was an average of fewer than two events per year that each caused $1 billion in damages, compared to an average of 9.5 such events per year in this decade. And the average annual total damage cost from these severe events soared from $20 billion per year in the 1980s to $85 billion in the 2010s. (see Figure 1)

Billion-dollar extreme weather events increasing in frequency, cost from 1980 to 2012



Sources: National Oceanic and Atmospheric Administration, Billion-Dollar Weather/Climate Disasters (Department of Commerce, 2013); Federal Emergency Management Agency, "Disaster Declarations," available at http://www.fema.gov/disasters (last accessed June 2013).

The National Climate Assessment draft on the impact of climate change in the United States predicts that floods, storms, droughts, heat waves, and wildfires will increase in frequency or ferocity, or both, in the coming years.[29] The report also notes that the country's infrastructure was not built to withstand such extreme weather events and warns that:

> *Human-induced climate change is projected to continue and accelerate significantly if emissions of heat-trapping gases continue to increase … with more climate-related impacts over the next few decades … Many [climate-related changes] will be disruptive to society because our institutions and infrastructure have been designed for the relatively stable climate of the past, not the changing one of the present and future.*[30]

On June 12 FEMA and the Federal Insurance and Mitigation Administration, which oversees the National Flood Insurance Program, released a report titled "The Impact of Climate Change and Population Growth on the National Flood Insurance Program Through 2100."[31] This analysis predicts that climate change will be the major source of the future increase of riverine flooding and that coastal flooding would increase by nearly 50 percent this century.[32] According to the report:

> *Approximately 30% of these increases in flood discharge, SFHA [Special Flood Hazard Areas], and base floodplain depth may be attributed to normal population growth, while 70% of the changes may be attributed to the influence of climate change … Nationally, considering riverine and coastal floods together, the average increase in the SFHA by the year 2100 is projected to be about 40% or 45%.*[33]

At a June 14 Clinton Global Initiative plenary session on "Cooperation and Collaboration," Gov. Christie noted that community resilience from extreme weather "is going to be [a] long-term project for our country."[34]

Create a dedicated fund to assist community-resilience efforts

There is not a reliable estimate of the total investment that would be required to significantly increase nationwide community resilience to future severe storms, floods, droughts, heat waves, and wildfires. What we do know, however, is that the first step to increase protection for people and businesses threatened by future extreme weather is to conduct a comprehensive nationwide assessment of community-resilience needs.

There are some individual estimates of the cost of resilience infrastructure repair. A 2012 CAP analysis, for instance, determined that, "14,000 dams across the country can be classified as 'high-hazard' meaning a dam failure or operational error could result in the loss of human life."[35] To prevent such failures, CAP recommends an investment of at least $1 billion annually in dam and levee repairs. From FY 2011 to FY 2013 the federal National Dam Safety program received less than $10 million annually.[36]

Revenue that should be targeted to resilience is too often diverted to disaster recovery or falls victim to shortsighted austerity measures such as the budget sequester.[37] The federal government could save additional lives and money by increasing assistance to communities to help them address their resilience needs. To that end, we recommend the creation of a dedicated fund for community resilience with annual revenue equal to one-third of the total federal disaster relief and recovery spending from the previous three years.[38] For fiscal year 2013, we estimate that the amount earmarked for such a resilience fund would have been approximately $7 billion using this formula.[39]

The money dedicated for resilience could come from a small levy on some or all of the fossil fuels that emit the carbon pollution responsible for climate change, which scientists

predict will exacerbate extreme weather. Coal companies, for example, paid only $800 million in royalties for 470 million tons of coal mined from public lands in 2012, though the companies sold the coal for $7 billion.[40] Increasing the royalty rate for private production of publicly owned coal, oil, and natural gas could generate additional revenue to invest in community-resilience programs. The Obama administration has the authority to raise the royalty rates, but only Congress can dedicate these funds to resilience efforts.

Alternatively, Rep. Lois Capps (D-CA) and 39 other Democratic representatives endorsed a CAP proposal calling for the administration to appoint a bipartisan blue ribbon panel to assess the total need for resilience assistance and propose a method to raise dedicated revenue to pay for it.[41] Panelists could include state and local officials, business leaders, farmers, the leaders of nongovernmental organizations, and other citizens who recently suffered from major extreme weather events. These leaders ideally would forcefully advocate that Congress adopt the resilience-funding proposal they develop.

In addition, we need an annual and complete accounting of federal funds spent on every disaster-recovery program in the previous fiscal year.[42] Such an accounting would enable public officials and everyday citizens to better understand the true cost to taxpayers of unchecked extreme weather. An accounting of federal investments in resilience programs would highlight the gap between resilience needs and available resources.

Another important reform would be to ensure that future rebuilding paid for with federal recovery funds increases community resilience to future extreme weather, even if the new structures are more costly. In a forthcoming issue brief, CAP's Cathleen Kelly and Jackie Weidman will propose the addition of this provision to the Robert T. Stafford Disaster Relief and Emergency Assistance Act, which governs FEMA disaster recovery efforts.[43] Likewise, non-FEMA federal disaster programs should invest in more resilient replacement structures.

Superstorm Sandy relief includes resilience investments

The Obama administration requested $13 billion "specifically for mitigation of damage from potential future storms and flooding," according to the Congressional Research Service, or CRS.[48] The final Disaster Relief Act, however, did not clearly separate funding for disaster relief and recovery from mitigation. Furthermore, CRS noted that the administration's request for mitigation funds was not clear. It reports that, "some of the activities outlined in the administration's proposal as 'mitigation' appear to be orientated towards 'recovery and repair,' and vice versa."[49]

The recently released New York City resilience plan called "A Stronger, More Resilient New York" is partially financed by the Disaster Relief Act.[50] Here too it is difficult to determine the precise investment of these funds in resilience measures. The New York City plan, for instance, includes $648 million for "housing recovery and resiliency programs" but does not differentiate the funding levels for each activity.[51] Gov. Christie noted that for New Jersey, "hazardous mitigation funds we're getting in the Sandy aid package helps us to mitigate future hazards."[52]

A significant portion of money from the Disaster Relief Act will certainly pay for resilience or mitigation efforts in Connecticut, New Jersey, and New York, but we did not attempt to approximate the resilience funding from the Disaster Relief Act for our estimate of federal spending for general community-resilience measures in fiscal years 2011 through 2013.

Conclusion

Mayor Bloomberg said that his resilience plan is essential because "we have to prepare for what the scientists say is a likely scenario" due to climate change.[44] Noted climate scientists Michael Oppenheimer and Kevin Trenberth of Princeton University and the National Center for Atmospheric Research, respectively, recently warned that:

> *Man-made heat-trapping gases are warming our planet and leading to … Increases in heat waves and record high temperatures … more severe rainstorms, droughts and wildfires; and coastal communities threatened by rising seas all offer a preview of the new normal in a warmer world.*[45]

To protect our communities from extreme weather, the federal government must implement the Clean Air Act requirement to reduce the pollution responsible for climate change, beginning with electric power plants—the largest uncontrolled domestic source of climate pollution.[46]

In addition, President Bill Clinton recently advised public officials that, "We have got to start to become a resilient society … If you plan to resist the worst destruction; you plan for quick spring back, you can do this. You can minimize these damages."[47]

To accomplish this goal, we must increase the federal investment in community resilience to reduce fatalities and the economic damage wrought by extreme weather events. Every threatened community should become as resilient as New York City and New Jersey will be due to federal investments in their efforts.

Methodology

Because there is not a comprehensive accounting of federal resilience programs, our goal was to estimate this total. In reaching our estimate we tallied investments in federal resilience programs that protect people, infrastructure, and water resources that are vulnerable to natural disasters. We identified federal programs whose primary purpose is disaster resilience, climate change adaptation, and/or land and water conservation. The programs' revenue figures are in their departments' annual "budget in brief" reports for fiscal year 2011 through fiscal year 2014. The figures are "budget authority," "federal appropriations," or "budget obligation," which reflect the amount of revenue that Congress set aside to pay for disaster resilience. For a complete list of programs, annual funding, and data sources, please refer to the attached spreadsheet.

We were unable to identify spending for some programs because hey did not have their own budget line item, such as NASA's Climate Adaptation Science Investigator Workgroup. Although extremely valuable to help communities make last-minute preparations for imminent extreme weather events, we did not include programs that predict and track weather patterns, such as NOAA's National Hurricane Center and the U.S. Drought Monitor. Chapter 28 of the National Climate Assessment draft includes a list of these programs.

Our estimate of federal resilience investments inevitably has gaps, but we believe it includes all of the major programs to protect homes, schools, businesses, farms, and communities from extreme weather events. We welcome any documentation for corrections.

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