



Safe, Strong, and Just Rebuilding After Hurricanes Harvey, Irma, and Maria

A Policy Road Map for Congress

By Cathleen Kelly, Kristina Costa, and Sarah Edelman October 2017

Center for American Progress



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Introduction and summary

The 2017 hurricane season will not end until November 30, but the intensity, number, and destructive impacts of this year's storms have already broken records. This is the first year on record in which three Category 4 hurricanes have made landfall in the United States. Hurricane Harvey set an all-time record for most rainfall from a single event—as much as 55 inches—causing catastrophic flooding.¹ Hurricane Irma was one of the most powerful hurricanes ever observed and caused the biggest power outage in American history—leaving roughly 17 million people without electricity.² Just days later, Hurricane Maria hammered Puerto Rico, destroying homes, knocking out power island-wide, causing at least a partial failure of the Guajataca Dam, and creating a humanitarian crisis for the 3.4 million U.S. citizens who live there as food and fresh water supplies dwindle.³

As of this writing, the combined storms have killed more than 176 people in the United States, Puerto Rico, and the U.S. Virgin Islands—a toll that continues to rise.⁴ This will be the most expensive hurricane season ever in the United States; Harvey and Irma alone inflicted as much as \$290 billion in damages.⁵ Recovery in all affected communities will take years. And families living paycheck to paycheck may never recover at all.

As Congress considers options for responding to these catastrophes, lawmakers should do more than rush emergency aid out the door. They should heed the lessons from past disasters, such as Hurricane Katrina and Superstorm Sandy, by supporting communities in making investments built to last and by helping all those affected by Harvey, Irma, and Maria recover.

The frequency and intensity of extreme weather events is on the rise, affecting four times as many U.S. counties today as 40 years ago.⁶ The best science says that climate change is only going to make these events worse in the future. Downpours will be more frequent and extreme, heat waves will be longer and more punishing, the sea level will rise, and hurricanes will be more powerful.⁷

Failure to take steps now to protect American communities from the risks they face will endanger lives, economies, and property for decades to come.

Failing to prepare for more extreme weather would also waste taxpayer money. The fact is, it makes good fiscal sense for all levels of government to take immediate steps to build stronger, more resilient infrastructure and communities and to make smarter and safer decisions about where to build homes and industrial facilities. Every \$1 spent on mitigation measures ahead of a disaster saves \$4 down the road, according to the National Institute of Building Sciences.⁸ The alternative is continuing down a business-as-usual path of poorly designed infrastructure, homes, and industrial plants in flood-prone areas that will require repeated, costly repair or rebuilding and threaten the health and safety of the American people.

This year's hurricanes have also laid bare the dangers posed by Superfund sites and other toxic facilities when disaster strikes. The Houston metropolitan area—a mecca for petrochemical companies—is home to more than a dozen federal Superfund sites, some of which are among the most dangerous such sites in the country.⁹ In the days following Harvey, 14 toxic waste sites in the area were flooded or damaged, and roughly 100 spills of dangerous substances were reported.¹⁰ A 2012 Environmental Protection Agency (EPA) assessment identified 500 Superfund sites in floodplains, including 50 along coasts vulnerable to sea level rise and storm surge.¹¹

Superfund sites are not the only threat to communities as climate change fuels more intense floods and storms. Roughly 4.6 million pounds of pollutants—including carbon monoxide, ethylene, sulfur, nitrogen oxides, benzene, and other volatile organic compounds—were released by 46 petrochemical plants and refineries across 13 counties before, during, and after Harvey.¹² The same amount of pollution that would normally have contaminated the city over the course of six months spilled into Houston in the days following Harvey. Residents reported respiratory problems, headaches, and nausea, and the jump in pollution increased long-term health risks such as cancer.¹³ With so many of Houston's industrial polluters located alongside low-income Latino and African American communities, Robert Bullard, a leading environmental justice expert, described Harvey as “a perfect storm of pollution, environmental racism, and health risks that are probably not going to be measured and assessed until decades later.”¹⁴

And the economic, public health, and emotional tolls of an extreme weather event extend well into the future. When the levees protecting New Orleans failed during Hurricane Katrina, at least 400,000 people were displaced—some for a few days, some for a few months, and some still to this day.¹⁵ The storm and subsequent development decisions virtually eradicated the city’s affordable housing stock, such that—10 years later—16,000 families were still on the waitlist for subsidized housing.¹⁶ And the storm changed the city’s racial and socio-economic makeup too. More than 40 percent of black New Orleanians who left after Katrina never returned, hollowing out the city’s black middle class in particular.¹⁷

Today’s policymakers and community leaders, however, know more than ever before about policies and programs that can help build stronger, more resilient infrastructure and housing while also ensuring that historically disadvantaged communities are neither left out of the planning process nor left behind during rebuilding.

When it comes to rebuilding after this season’s hurricanes, Congress can and must do better. This report lays out four priorities for the congressional response to hurricanes Harvey, Irma, and Maria:

- **Build back better.** Congressional disaster aid packages should support programs at the U.S. Department of Housing and Urban Development (HUD), the Federal Emergency Management Agency (FEMA), and other federal agencies that enable communities to plan for the future, rebuild infrastructure to higher standards, and support innovative solutions that can better withstand extreme weather and other risks.
- **Update flood risk data—and use it.** In too many cases, FEMA flood maps are out of date or otherwise inaccurate, and none of them currently take into account the anticipated impacts of climate change. Congress should support updating flood maps for areas affected by this season’s hurricanes and other high-risk communities and ensure that federally supported infrastructure is built to withstand more frequent and severe floods.

- **Prioritize communities that have the fewest resources to rebuild.** Extreme weather events hit hardest in areas struggling to make ends meet and in black and Latino communities and other communities of color already overburdened by polluted air and water. Congress should ensure that any disaster aid package prioritizes support for families who need it the most—including in Puerto Rico and the U.S. Virgin Islands—and creates rather than hinders access to economic opportunity.
- **Plan ahead to lower the risks and costs of the next disaster.** It is not a matter of if extreme weather will strike the United States but when—including in the same communities struggling to respond to this year’s hurricane season. Congress has a fiscal and moral responsibility to support innovative and equitable strategies to build long-term resilience nationwide, such as establishing a so-called disaster deductible to encourage states, counties, and cities to take steps to protect their residents before disaster strikes.

Build back better

Congress should support programs that will enable businesses and policymakers in disaster-affected communities to account accurately for future extreme weather and flood risks and build infrastructure to better withstand those threats. Otherwise, taxpayers will find themselves footing the bill for rebuilding the same infrastructure time after time. To help communities build back better, Congress should increase funding for effective programs that provide flexibility to make smart rebuilding decisions; support developing stronger design guidelines so that infrastructure is built to withstand extreme weather and other risks; and expand investments in clean energy and green infrastructure solutions.

Increase funding for flexible programs to support smart rebuilding strategies

In the past, federal disaster relief has often required communities to build damaged structures back to the condition they were in before they were damaged. As the nation faces more frequent and extreme storms and other costly disasters, Congress must recognize that it is a waste of taxpayer dollars not to support infrastructure that is built to last.

For instance, as part of the Superstorm Sandy recovery bill, Congress created the FEMA 428 program, a flexible funding stream that allowed the agency to pilot new approaches to both debris removal and long-term rebuilding.¹⁸ The Rockaway Beach neighborhood in New York City suffered some of the most severe damage from Superstorm Sandy, with thousands of homes destroyed. FEMA 428 helped finance an ambitious rebuilding of the Rockaway Beach boardwalk that not only provided recreation space but also included multiple measures to help the structure withstand future storms and protect the community beyond.¹⁹ Congress should expand the successful FEMA 428 program as part of its response to this season's hurricanes.

There are also opportunities to use other federal programs to encourage states and cities to think seriously about how they are going to build resilience to future disasters. HUD's Community Development Block Grant program typically funnels billions of dollars to disaster areas through its Disaster Recovery Program (CDBG-DR).²⁰ Congress should direct HUD to ask grantees to specify in their applications for funding how they plan to rebuild in ways that reduce future extreme weather and disaster risks. For states such as Texas that do not already have comprehensive resilience plans in place, this requirement could nudge state and local officials to rethink how communities are designed to withstand future threats.

Finally, Congress should consider allocating some percentage of infrastructure aid—at least 10 percent—directly to the disaster-affected communities, rather than requiring all federal funds to flow through governors' mansions before reaching these communities. Sending recovery dollars directly to the affected communities would empower local decision-makers and help circumvent political infighting between state and municipal elected officials who may be from different political parties.²¹

Support design guidelines that account for extreme weather risks

After Superstorm Sandy, New York City became one of the first communities in the country to create a comprehensive set of climate resilience design guidelines for major projects in the region. The guidelines define a resilient facility as “one built to withstand or recover quickly from natural hazards,” and they provide options for withstanding climate change-related risks, from more extreme heat to more severe floods, across the useful life of a project.²²

Congress should create a grant program to support communities affected by hurricanes Harvey, Irma, and Maria in creating their own resilient design guidelines; provide adequate funds to the U.S. Global Change Research Program, a 13-agency program that conducts the National Climate Assessment; and expand technical assistance to help states and cities interpret the assessment's findings.

The Superstorm Sandy response also pioneered an entirely new federal approach to rebuilding: a \$1 billion National Disaster Resilience Competition, which allowed states and communities hit by major disasters in 2011, 2012, and 2013 to apply for competitive grants to fund major resilient infrastructure projects.²³ HUD received

applications for more than \$7 billion in projects as part of the competition.²⁴ Since 2013, when the Sandy relief package was enacted, 1,302 counties have been affected by disasters with at least \$1 billion each in damages.²⁵

Given the enormous need across the country, as well as the significant federal resources invested in designing and running the successful competition, Congress should launch a second, \$2 billion round of the National Disaster Resilience Competition for communities affected by federally declared disasters from 2014 through 2017.

Provide incentives to increase energy efficiency

More than 100,000 homes were damaged by floodwaters in Hurricane Harvey.²⁶ This means that hundreds of thousands of dishwashers, washing machines, dryers, refrigerators, and other appliances could be headed for the junkyard. Replacing old appliances with energy-efficient models saves families hundreds of dollars on their energy bills every year, while also reducing dangerous pollution.²⁷

There are also opportunities to reduce energy demand, cut pollution that is harmful to children's health, and save families money when rehabilitating heavily damaged properties. Flood damage typically requires removing drywall and insulation, often to heights well above the maximum extent of the flood. Taking advantage of the opportunity to seal air leaks with more efficient insulation can save 10 to 20 percent annually on heating and cooling bills, according to the U.S. Department of Energy.²⁸

Congress should renew and expand the tax credits for residential energy efficiency improvements, renewable energy installations, and energy-efficient heating and cooling systems that expired at the end of 2016.²⁹ For low-income families and renters whose landlords may not choose the most efficient appliances, Congress should also consider creating a direct rebate program that would repay a portion of the cost of purchasing appliances certified by Energy Star, the federal energy efficiency program.

Build energy grids to withstand severe storms

Before this year, the nation's worst blackout came in the wake of Superstorm Sandy. The storm also provided important lessons for how to improve the resilience and reliability of the electricity sector. A housing complex in the Bronx, for

example, was able to keep the lights on during Sandy “because it is equipped with a microgrid that disconnected temporarily from the centralized power system.”³⁰ Federal and state governments should support neighborhoods that want to build microgrids of their own.

Congress should also examine where state policies undermine energy reliability and consider federal solutions. In Florida, for instance, homeowners with rooftop solar panels are legally required to connect those panels to the electric grid. State law further prohibits homeowners from generating power from their solar panels in the event of a grid outage.³¹ Hurricane Irma shows that this state law is not just shortsighted but also dangerous. Eleven residents have died and more became sick when a nursing home—now under criminal investigation—lost air conditioning in Florida’s power outages.³² Had that nursing home been equipped with rooftop solar panels, its staff would not have been allowed to turn them on in order to power the facility’s climate control system.

Expand investments in green and resilient infrastructure

Some of the best solutions to protect communities from extreme weather events can be found in nature. Following Superstorm Sandy, New York and New Jersey expanded investments in green infrastructure to protect communities from the impacts of climate change. For instance, New York City is restoring oyster beds to serve as natural barriers to devastating storm surges.³³

Smaller-scale solutions can make a difference too. After a series of heavy downpours caused Philadelphia’s combined sewer system to overflow repeatedly in some neighborhoods, the city launched the Green City, Clean Waters program.³⁴ The city replaced paved sidewalks with porous pavements that allow water to drain into the ground below, created small curbside gardens to absorb rainwater, installed green roofs and rain barrels, and restored local wetlands.³⁵ Together, these measures help keep large volumes of water from overwhelming the aging combined sewer system, prevent toxic runoff from flowing into area waterways, and beautify neighborhoods at the same time.

Congress should include robust funding in any hurricane aid package to help communities pursue proven green infrastructure solutions that will help reduce flood risks.

Update flood risk data—and use them to make decisions

The Federal Emergency Management Agency is the keeper of the nation's flood maps—the information that informs residents of their flood risk and determines whether families are required to buy flood insurance to live in certain areas. Congress should urgently appropriate more resources for FEMA to update flood maps in Houston and beyond to accurately reflect current and anticipated risks, as well as require federally funded infrastructure to be built to a higher and safer standard.

Update FEMA flood maps

About 40 percent of homes damaged by Hurricane Harvey were located outside the 100-year floodplain—the area designated by FEMA to have a 1-in-100 chance of flooding in any one year.³⁶ What's more, from 1999 to 2009, some 75 percent of flood damage in parts of the Houston area occurred outside the FEMA 100-year floodplain, according to a new study from researchers at Rice University and Texas A&M University.³⁷ In other words, this is not just a Harvey problem—it is a systematic, ongoing failure that is costing families and communities year after year.

Traditionally, FEMA flood maps have relied on historical data to determine the scope of the floodplain—meaning that they do not take into account the risks communities face from more frequent and extreme downpours and sea level rise. Local politicians sometimes exert pressure to minimize the extent of the floodplain in order to avoid limiting development.³⁸ And changes in upstream development can profoundly alter flood risk in older, downstream neighborhoods—as in the affluent Meyerland area of Houston, where the floodplain has expanded from just a small area in 1979 to cover nearly the entire neighborhood today.³⁹ These changes track closely with the boom in suburban and exurban construction, which put buildings and pavement where water-absorbing prairies used to be.

Following Hurricane Sandy, Congress appropriated funds for FEMA to update flood maps in the New York and New Jersey regions. It is clear that the agency must do the same for communities affected by hurricanes Harvey, Irma, and Maria, as well as for other high-risk communities that were not hit by hurricanes this season but are likely to be affected by future storms.

Earlier this year, New York went even further and formally adopted a set of projections for climate change-driven sea level rise that will be used in planning long-term infrastructure investments.⁴⁰ Congress could consider requiring other states to do the same and appropriate funds to help states assess the flood risks posed to their communities by sea level rise and increasingly severe downpours, based on the data in the National Climate Assessment.

Require federally funded infrastructure to be built to a higher standard

After Superstorm Sandy, the federal government issued a new Federal Flood Risk Management Standard, a set of rules that required federally funded infrastructure projects to be built to a higher standard that accurately reflected risks from extreme weather and climate change in order to prevent taxpayer money from being wasted on projects that were at high risk of repeated flood damage. President Donald Trump rescinded those rules just 10 days before Harvey made landfall.⁴¹

The new standard required that federally funded projects be either elevated at least two feet above the 100-year floodplain or built to withstand a 500-year flood event. For critical infrastructure, such as hospitals and fire stations, the standard required three feet of elevation. The standard also redefined the floodplain to take into account “a climate-informed science approach that uses the best-available, actionable hydrologic and hydraulic data and methods that integrate current and future changes in flooding based on climate science.”⁴²

Without these standards, billions of taxpayer dollars could be spent on infrastructure not built to withstand future floods. While reports indicate that the Trump administration may be reconsidering its actions, Congress should make the decision for the administration by directing it to reinstate the federal standard. Failing that, Congress should at least require federally funded projects supported by the hurricane-relief supplemental aid package to be built two feet above the current floodplain, and three feet for critical infrastructure.

Prioritize communities that have the fewest resources to rebuild

In the wake of a natural disaster, families of all incomes scramble to find shelter and to rebuild their homes. However, while upper-income households often have the resources to rebuild quickly, it can take years for low- and moderate-income households to rebuild—if they rebuild at all. Working families who rent are often forced to uproot entirely when their affordable rental housing is not rebuilt. Severe storms can also cause long-lasting health problems for communities that live near Superfund sites and industrial facilities that store toxic substances or emit toxic air or water pollution; many families in these communities are living paycheck to paycheck. As communities in Texas, Florida, Puerto Rico, and the U.S. Virgin Islands pick up the pieces in the wake of Harvey, Irma and Maria, Congress must take steps to rebuild affordable housing, support homeowners in need, adequately fund toxic pollution cleanup, hold negligent companies accountable for threatening public health and safety, and give communities a seat at the table to help shape decision-making, priority-setting, and plans around rebuilding.

Preserve and expand affordable housing stock

Hundreds of thousands of people living in communities affected by hurricanes Harvey, Irma, and Maria live in public or federally subsidized housing. There are more than 200,000 subsidized rental units in areas affected by Harvey alone.⁴³ In the U.S. Virgin Islands, Irma nearly demolished one public housing development and rendered about one-third of its units uninhabitable.⁴⁴

State and local governments have a mixed track record of repairing or rebuilding this important housing stock after a natural disaster. The city of New Orleans lost more than half of its public housing residences after Hurricane Katrina.⁴⁵ In the years following Hurricane Ike, only 40 out of 500 public housing units were rebuilt in Galveston, Texas.⁴⁶ Nationally, public housing is currently running a \$25 billion capital repairs deficit.⁴⁷ As a result of decades of disinvestment, public housing authorities do not have the funds necessary to rebuild; targeted federal investment is needed.

Despite the great need, affordable housing is too often overlooked by state and local governments administering federal relief dollars. Congress can help ensure that affordable housing is not overlooked by requiring CDBG-DR grantees to direct relief dollars toward the areas of greatest unmet need. Later this fall, the Department of Housing and Urban Development will publish an unmet-needs analysis of the areas affected by storms this year that can guide local decision-makers.

Analysts predict that rental housing will become less affordable in Houston in the months and years following Hurricane Harvey.⁴⁸ With fewer rental units in good condition available, and with more families seeking short-term rentals as they rebuild their homes, rental property owners will have leverage to raise rents. By focusing the appropriate resources toward preserving the affordable rental housing stock, state and local governments can help ensure a healthier rental market.

Congress should also encourage FEMA to dedicate special funding for the rehabilitation of public housing stock. After Hurricane Sandy, FEMA dedicated \$3 billion toward rebuilding public housing units in New York City. The city is using the funds for repairs and floodproofing for more than 200 buildings, helping around 60,000 residents.⁴⁹

Support homeowners in need and historically excluded from property ownership

For most families, their home is their greatest asset; losing a home means losing most of their family's wealth. The stakes are especially high for African American and Latino communities and other communities of color living in areas affected by the storms. In Houston, the share of mortgage originations going to African American and Latino households has been on the rise—a hopeful trend in an otherwise bleak national lending environment. Thirty-two percent of mortgages originated last year went to African American and Latino borrowers, an increase of 5 percent, according to an Urban Institute analysis of the Houston area.⁵⁰ A spike in foreclosures could strip wealth from many of these new homeowners.

In Florida, many homeowners are only now beginning to recover from the 2008 housing crisis. In 2016, there were 44,732 foreclosures in Florida—a vast improvement from earlier in the foreclosure crisis, but far from healthy.⁵¹ A fresh round of hurricane-related foreclosures could destabilize communities on the road to recovery, many of which have large black and Latino populations.⁵²

The Federal Housing Administration (FHA), which insures mortgages, could also experience a shock if many homeowners begin defaulting. According to an Urban Institute analysis of the Houston area, the FHA insured between 25 and 50 percent of new mortgages originated in many of the zip codes hardest hit by Harvey.⁵³ The FHA also insured close to one-third of new mortgages originated in Florida in 2015.⁵⁴

To prevent unnecessary foreclosures, Congress should direct the FHA, the U.S. Department of Veterans Affairs, the U.S. Department of Agriculture, and the Federal Housing Finance Agency, which regulates Fannie Mae and Freddie Mac, to allow hard-hit homeowners to suspend their mortgage payments for at least 12 months while they rebuild and to provide homeowners with fair repayment terms once the suspension period ends. Homeowners should also receive partial proceeds from their insurance policies so that they can secure their property in the short term to prevent further damage. In the past, mortgage services have often withheld these funds until the homeowner begins to rebuild.

Congress should also instruct HUD to have a fair, effective process for providing rebuilding aid to homeowners through the CDBG-DR program. In the aftermath of Hurricane Katrina, homeowners received aid based on the value of their homes instead of the cost of rehabilitation. Under this formula, higher-income households that owned higher-valued homes were likely to receive more aid than lower-income households who were often in greater need. This approach was not only unfair but also ineffective.⁵⁵

Congress should also ensure that low-income households have access to free housing counseling and legal services while they rebuild. In the aftermath of a natural disaster, families often need assistance assessing their options, negotiating with mortgage servicing companies or landlords to keep their home, and even pulling together the paperwork they need to qualify for the loans and grants they will need to rebuild.⁵⁶ They also need help deciding how to rebuild their home to be more resilient in order to prevent future damage and manage flood insurance costs.

Finally, Congress should instruct federal agencies and state and local governments to create and implement plans for reaching out to residents with limited English proficiency. In order for recovery efforts to be successful, residents with limited English proficiency must be able to access the resources they need.

Prioritize disaster aid in areas within a 5-mile radius of Superfund and industrial sites

While extreme weather disasters and floods affect entire cities and neighborhoods, they strike communities of color and families living paycheck to paycheck the hardest. Historic inequities, discriminatory housing, and other policies have pushed low-income communities and communities of color to low-lying areas highly vulnerable to flooding and located next to sources of pollution, including power plants, industrial and Superfund sites, highways, and landfills.⁵⁷ Families who struggle to make ends meet have the fewest resources to evacuate ahead of a disaster or to adequately prepare for and withstand the impacts.⁵⁸

People living in neighborhoods near chemical plants—referred to as fence-line communities—confront what is termed the double jeopardy of daily exposure to high levels of air, water, and soil contamination and the risk of harmful chemical explosions.⁵⁹ A 2014 report by Coming Clean found that nationwide, “residents of chemical facility vulnerability zones are disproportionately Black (African American) or Latino, have higher rates of poverty than the U.S. as a whole, and have lower housing values, incomes, and education levels than the national average.”⁶⁰

Congress should direct state and local officials receiving disaster aid to develop rebuilding plans that prioritize cleanup and rebuilding efforts in neighborhoods within a 5-mile radius of Superfund sites, refineries, chemical plants, and other industrial facilities that were flooded or damaged by hurricanes Harvey, Irma, and Maria.

Direct the EPA to re-establish the Environmental Justice Office

In 1992, the Environmental Protection Agency launched the Office of Environmental Justice to work across the EPA and with other agencies to ensure that all people—regardless of race, ethnicity, or income—enjoy the same level of protection from environmental and public health threats, as well as equal access to clean air and clean drinking water.⁶¹ President Trump proposed eliminating funding for the Office of Environmental Justice in his fiscal year 2018 budget.⁶² In September, EPA Administrator Scott Pruitt announced that he will move the Environmental Justice Office from the Office of Enforcement and Compliance Assurance to the Office of Policy. Advocates and former EPA officials are concerned that this move will put political pressure on staff members to reshape their work and undermine the agency’s environmental justice goals.⁶³

Congress should direct Pruitt to restore the Office of Environmental Justice to its previous location within the EPA's Office of Enforcement and Compliance Assurance and appropriate at least \$6.7 million for the Office of Environmental Justice in FY 2018—equivalent to the FY 2017 funding level.⁶⁴

Direct the EPA to take enforcement action for gross negligence and avoidable pollution releases

In Crosby, Texas, storage containers holding liquid organic peroxides exploded at the Arkema chemical plant after floodwaters cut off central and backup power needed to keep the 19.5 tons of volatile chemicals cool. Local officials warned residents living within the 1.5-mile radius surrounding the plant to evacuate, even as the EPA downplayed the explosion's dangers.⁶⁵ The explosions overwhelmed 21 first responders with smoke, forcing them to seek immediate medical care.⁶⁶ In Puerto Rico, floodwaters surged through a community where Applied Energy Systems Inc. stores a five-story mound of uncovered coal ash packed with heavy metals, including arsenic and mercury.⁶⁷ Congress should direct the EPA to take enforcement action against companies responsible for avoidable or unlawful pollution releases, spills, explosions, and other gross negligence that put public health and air and water quality at risk during this hurricane season and over the long term.

Fund assessments of chemical spills and water systems and secure Superfund sites

The EPA provides essential support to communities before and after disasters to protect public health, drinking water, and air quality. But President Trump has proposed slashing funds for Superfund cleanups by roughly 25 percent and cutting the EPA's Superfund Emergency Response and Removal program, which helps protect communities from oil spills and sudden releases of toxic substances, by 18 percent.⁶⁸ Trump's budget would also cut EPA air and water quality monitoring, which is essential to protect communities from hazardous releases and water contamination.

Congress should appropriate funds for the EPA to adequately assess the immediate and long-term public health threats linked to chemical spills, toxic air pollution, and other releases of hazardous material before, during, and after the storms and to ensure that the companies responsible for these releases take adequate steps to

prevent them from occurring in the future. Congress should also include funds for the EPA to secure Superfund sites that were flooded or damaged by the storms so that they are protected from future flooding and extreme weather events. Finally, Congress should ensure that the EPA has adequate resources to continue to provide critical public health, drinking water, and air quality protections for communities across the country.

Require an inclusive process to design equitable local cleanup and rebuilding plans

The rush to rebuild in a disaster's aftermath often puts pressure on local officials to make hasty rebuilding decisions with input from only a few politically connected stakeholders. Congress should require local officials seeking disaster aid to design inclusive processes to meaningfully engage communities in priority-setting and the design of cleanup and rebuilding plans. The National Environmental Policy Act (NEPA) provides a framework for informed governmental decision-making by requiring a careful review of the impacts of major infrastructure and rebuilding projects and requiring the federal government to conduct public outreach so that residents can voice their concerns and opinions about projects in their communities.⁶⁹ Congress should direct federal agencies to fully implement NEPA public outreach, information sharing, and environmental review requirements to ensure that community members have adequate say in setting rebuilding priorities and how their neighborhoods will be reconstructed.

Support displaced populations and fund adequate data collection

Beyond support from FEMA to restore privately owned homes, there are few programs to help displaced families return to their communities. This year's hurricane season highlights the need for federal and local policies to minimize the number of people uprooted from their communities by extreme weather.

Displacement goes far beyond inconvenience. When people cannot return home, their jobs, health care, schooling, and other public services are also disrupted or lost.⁷⁰ A storm can push families living paycheck to paycheck into a cycle of poverty that is difficult to escape.⁷¹ The loss of entire communities, including the relationships between neighbors, social welfare agencies, and local businesses, can result in additional mental, physical, and economic challenges for displaced families.⁷²

Congress should ensure that funding is available for adequate rental assistance for low-income families who are displaced by the storms, which can be administered through the Disaster Housing Assistance Program.⁷³ Also, Congress can instruct HUD to ensure that any lost federally subsidized affordable housing units are rebuilt or replaced so that displaced families have the choice to return.

Congress should also direct the Bureau of Labor Statistics and the Census Bureau to track and survey displaced residents. These data, which were collected to track the welfare and whereabouts of people displaced by Hurricane Katrina, can help policymakers anticipate and respond to needs for additional services such as health care, emergency K-12 education funding, and affordable housing.⁷⁴

Plan ahead to lower the risks and cost of the next disaster

The United States has been hit by 212 extreme weather and climate disasters since 1980, collectively costing more than \$1.2 trillion.⁷⁵ In 2016 alone, extreme weather and climate disasters in Arkansas, California, Florida, Louisiana, Maryland, Missouri, North Carolina, Tennessee, Texas, and West Virginia caused 297 deaths and \$53 billion in economic damage.⁷⁶

Congress should support forward-thinking and equitable strategies to help minimize loss of life, damages, and rebuilding costs tied to future extreme weather events, including by expanding existing disaster risk reduction programs and creating new incentives for states, municipalities, and tribes to prepare before disaster strikes.

Expand funding for FEMA's Pre-Disaster Mitigation Grant Program

The Federal Emergency Management Agency's cost-effective Pre-Disaster Mitigation (PDM) Grant Program provides annual funding to states, communities, tribes, and territories to design and implement long-term plans to protect people, homes, and businesses from future extreme weather events.⁷⁷ PDM grants can help states, communities, and tribes develop hazard mitigation plans that assess future extreme weather and flood risks in a changing climate; improve public awareness of extreme weather threats; and build partnerships and long-term strategies to lower disaster risks.⁷⁸ PDM grants can also support projects such as elevating or upgrading homes to protect them from floods; buyouts of flood-prone properties whose owners want to move to safer ground; stormproofing schools, hospitals, and drinking water systems; and restoring floodplains and streams to keep floodwaters away from homes and other structures.⁷⁹

But President Trump proposed slashing the PDM program by more than 60 percent, or \$39 million, in his FY 2018 budget—a proposal that would cost Americans dearly.⁸⁰ According to The Pew Charitable Trusts, “From 2005 to 2014, the federal government spent \$277.6 billion on disaster assistance, while FEMA designated less than \$600 million toward its primary pre-disaster mitigation program.”⁸¹ In other words, Congress has spent 460 times more on disaster recovery than on actions to reduce disaster risks and costs before catastrophe strikes.

To reverse this costly and dangerous trend, Congress should include in the Harvey, Irma, and Maria disaster recovery package at least a fivefold increase in funding for the PDM program, relative to the FY 2017 appropriation—\$500 million in total. Congress should also steadily increase annual funding for the PDM program in the future. With every dollar invested in predisaster mitigation saving \$4 in recovery and rebuilding costs, as the National Institute of Building Sciences has found, then allocating at least \$500 million toward these activities would save \$2.5 billion in the years to come.⁸²

Establish a deductible for federal disaster assistance

To provide an incentive for states and municipalities to protect communities and taxpayers from dangerous and costly disasters before they happen, former FEMA Administrator Craig Fugate proposed creating a disaster deductible, which would establish a predetermined threshold that states would need to meet to access disaster aid through FEMA’s Public Assistance Program.⁸³ States would be able to reduce their deductible obligation by investing in disaster-planning risk-reduction strategies. Current FEMA Administrator Brock Long has voiced support for the disaster deductible proposal as a way to motivate smart state and local investments in disaster resilience, rather than rewarding risky development and lax land-use and building codes that drive up disaster damages and recovery costs.⁸⁴

Congress should direct FEMA to create a new federal disaster deductible to help lower the public health risks and costs of future disasters. Tribes, other communities of color, and communities in which most families earn below the federal median income should be exempt from meeting the disaster deductible.

Congress should also commission a study to assess design options for such a disaster deductible program. In the meantime, Congress should further specify that certain state and local investments can be counted toward meeting the federal disaster deductible, including the following:

- **Better and more equitable land-use planning:** Hurricane Harvey revealed how poor land-use planning can elevate flood risks and devastate communities.⁸⁵ The construction of homes and businesses in flood-prone areas has uprooted trees and paved over prairies crucial for soaking up stormwater.⁸⁶ The hard surfaces built along with these developments, including roads, parking lots, and driveways, accelerate rainwater runoff and can overwhelm stormwater management systems. Had Harris County, in which Houston is located, pursued a smarter development path, it may have endured less damage during Harvey. County flood managers estimate that 1 acre of prairie grass can absorb enough water to offset the extra storm runoff created by 2 acres of single-family homes.⁸⁷ In addition, industrial facilities, power plants, toxic waste sites, and landfills—with their associated environmental hazards—have historically been concentrated within and alongside communities of color or areas where families face economic and social challenges. Congress should use the disaster deductible to create incentives for smarter and higher-density development that preserves natural areas, prevents sprawl in floodplains, and stops industrial polluters from locating near communities and developers from building housing next to Superfund and toxic waste sites and industrial facilities.⁸⁸
- **Green infrastructure and coastal restoration:** Many of the most cost-effective disaster resilience solutions conserve, expand, and harness natural systems.⁸⁹ Cities across the country are protecting and expanding natural infrastructure to soak up stormwater, absorb the impact of storm surge and sea level rise, and reduce flood risks.⁹⁰ Investments in green infrastructure strategies—particularly in communities of color and low-income areas, where flood risks are disproportionately high—should count toward the federal disaster deductible.
- **Better building codes:** In 1992, Hurricane Andrew destroyed more than 125,000 homes in Florida and left roughly 250,000 people homeless.⁹¹ The storm prompted Florida’s state officials and legislature to adopt and implement a state-wide building code requiring sturdier construction of windows, roofs, doors, and supporting pillars to withstand hurricane-force winds.⁹² After Hurricane Matthew hit Florida in 2016, Martin County Building Department Director Larry Massing said, “Stricter codes that have been enforced since the early 2000’s and the lack of damage is a testament that we learned lessons from Hurricane Andrew. ... It’s made

a monstrous difference in the level of damage we've experienced."⁹³ Unfortunately, despite the demonstrated benefits of the codes, Florida enacted a law this year that prevents the state's building codes from automatically including design updates endorsed by the International Code Council, meaning that important stormproofing innovations could be left out of future code updates.⁹⁴ To save money and lives, Congress should use a disaster deductible to create incentives for cities and states to adopt strong codes that ensure that buildings are designed to withstand more intense storms and floods and require that those codes are regularly updated.⁹⁵

- **Updated design guidelines for buildings and infrastructure:** State and local governments can reduce their disaster risks by revising building and infrastructure design codes to incorporate forward-looking climate data.⁹⁶ Such updates should count toward meeting a federal disaster deductible.
- **Expand investments in microgrids and renewable energy:** Cities and counties that adopt community-based solar and microgrid projects—which help keep lights, air conditioning, and critical medical equipment on during and after disasters—should earn credit toward meeting the disaster deductible.⁹⁷
- **Diversify transit options:** Extreme weather events often highlight gaps in mobility access and the need for resilient transit networks. At the time of Hurricane Katrina, 1 in 5 New Orleans households did not own a vehicle.⁹⁸ Many of these households had below-median incomes before the hurricane and fared worse leading up to the storm and in its wake because they were unable to evacuate safely.⁹⁹ Superstorm Sandy also illustrated the importance of transit system resilience. Millions of public transit commuters were forced to use personal vehicles after the storm forced closures of subway, commuter rail, and bus systems, causing massive gridlock and higher air pollution.¹⁰⁰ City and county investments in diversifying and expanding public transit options that support safe evacuation and improve access to well-paying jobs—particularly in areas where people struggle to make ends meet and in communities of color—should count toward the disaster deductible.¹⁰¹
- **Buyout programs for repeatedly flooded properties:** State and local governments should also be able to meet a portion of their disaster deductible by creating equitable buyout programs that help willing sellers of repeatedly damaged properties move to safer ground and that are designed to help address rather than exacerbate existing affordable housing shortages.

Helping residents voluntarily move out of flood-prone properties

Regular flooding of a home, apartment building, or community can be heart-breaking and costly for residents, as well as expensive for taxpayers who help to shoulder the repair and rebuilding costs. To end the cycle of catastrophe followed by expensive repairs, many city and county officials leverage federal and state funding to buy properties that have been repeatedly flooded from willing sellers at or above market price and then take down the home or building to restore the land to its natural state.¹⁰²

Missouri used publicly funded voluntary buyouts to help families move out of homes repeatedly damaged by floods and avoided roughly \$100 million in losses between 1999 and 2008—earning a 212 percent return on its investment.¹⁰³ Mecklenburg County in North Carolina finances voluntary buyouts of at-risk homes and businesses through stormwater fees, helping relocate roughly 700 families out of harm's way.¹⁰⁴

Congress should encourage states that want to pursue buyout programs to replicate best practices from past initiatives. In cases where cities and counties offer voluntary buyouts in low-income areas, officials should ensure that they do not exacerbate affordable housing shortages by coupling buyouts with new investments in affordable housing units.

To maximize the cost savings of buyout programs, cities and states can provide incentives to encourage willing sellers to relocate to nearby areas to preserve social networks and the state or municipal tax base. For example, after Superstorm Sandy, New York state offered a small bonus on top of paying a seller the home's market price if the seller purchased a new home in the same county. To encourage entire flood-prone neighborhoods to participate, thereby maximizing the cost savings and resilience benefits of the program, the state also paid bonuses to groups of sellers with adjoining properties in areas with high flood risk.¹⁰⁵ County and city leaders should also support new investments in high-density affordable housing units to help multiple families participating in a buyout program from the same community who want to stay together.

Conclusion

In the aftermath of a disaster, policymakers have a responsibility to help residents rebuild their lives and communities. But disasters also provide rare opportunities to create new and equitable policies and incentives to make communities stronger for decades to come. These can fundamentally reshape land use practices, update building and infrastructure design codes, improve access to affordable housing, and build resilience to future extreme weather and flooding risks.

Ultimately, building resilient and just communities in the areas affected by Harvey, Irma, and Maria will require state, local, and federal policymakers to tear down historic barriers to economic opportunity so that all residents have the means to prepare for and recover from the next storm. By taking the actions proposed above, Congress can lower the cost of future extreme weather disasters in terms of property damaged, taxpayer dollars spent on rebuilding, and lives lost.

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