

Bracing for the Storm

How To Reform U.S. Disaster Policy To Prepare For A Riskier Future

Produced by SmarterSafer
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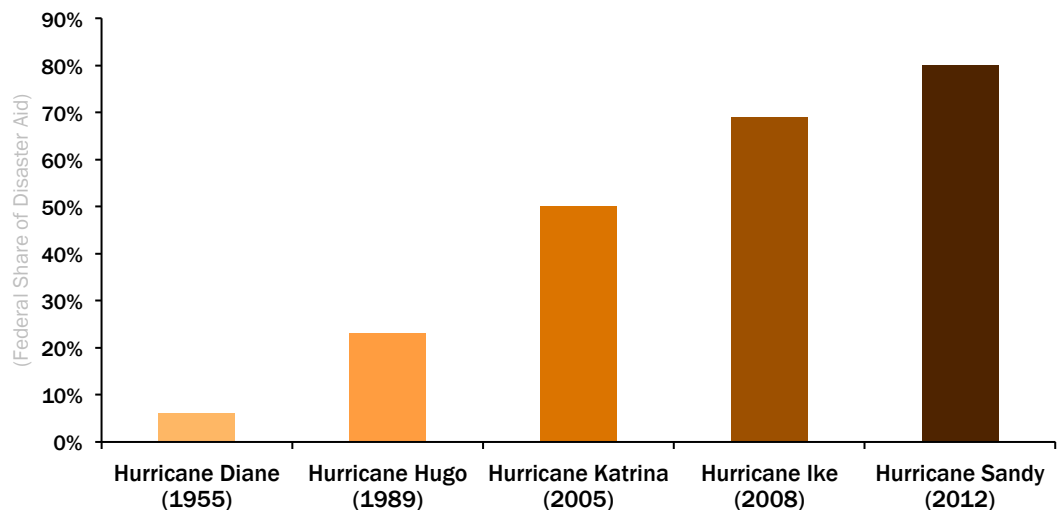
EXECUTIVE SUMMARY

Hurricanes, floods, fires, and heat waves resulting in millions of dollars of damage are no longer unusual events. They are now a fact of life, posing increased risk to life and property while driving up the costs of recovery. Both catastrophic and smaller-scale floods have been on the rise in communities throughout the country. The Western wildfire season has grown longer as warmer temperatures and longer periods of drought have become more common, and tropical storms and hurricanes have brought catastrophic damage to the U.S. over the past two decades. Disasters with a price tag exceeding \$1 billion, previously limited to one or two per year, now occur at least five to 10 times per year. Recent payouts for events like Superstorm Sandy have shattered previous records, taking a toll both on the federal budget and on the National Flood Insurance Program, which is now more than \$23 billion in debt.

As the frequency, severity, and cost of these disasters grows and federal spending on recovery rises, individuals, communities, and state and local governments must do everything possible to ensure they can withstand the next storm.

Our current natural disaster policy framework focuses heavily on responding to disasters, rather than putting protective measures in place to reduce our vulnerability and limit a disaster's impact. This needlessly exposes Americans to greater risks to life and property and results in much higher costs to the federal government.

Disaster Costs Increasingly Borne By Federal Govt



Source: Erwann Michel-Kerjan, Testimony 2013

Over the past few decades, the financial burden of disaster response has fallen increasingly on the federal government. Federal funds are provided post-disaster, with few standards to define the parameters for federal intervention or rules to ensure funds are used in an efficient way. The problem is also evident in the chaotic passage of aid following a disaster, which often results in significant new outlays that have little to do with emergency relief.

Neither the states nor the federal government devote sufficient resources to preparing communities and citizens for these growing risks. The ready availability of government aid after a disaster actually reduces individual and community incentives to invest in mitigation and makes it less likely homeowners and businesses will insure their property for disaster.

These problems are also embedded in the National Flood Insurance Program, which has long used federal insurance subsidies to mask the true risks of flooding. This federal program now faces a multibillion-dollar debt to US taxpayers as a result of increasingly powerful storms and hurricanes.

Moreover, there is little coordination between federal, state, and local governments and agencies, as well as private businesses and industry groups, when it comes to preparing for and mitigating before a storm or other disaster.

Rather than continuing on this course, the federal government must begin overhauling current disaster policies. This report identifies several reforms that could move the policy framework in a more sustainable direction.

Encourage Planning and Mitigation:

- Shift some federal resources to pre-disaster preparation to help communities plan for and mitigate risk.
- Provide disaster assistance on a sliding scale to incentivize communities to ramp up pre-disaster preparation, particularly through the use of natural infrastructure and smarter safer building.
- Ensure disaster spending is linked to concrete results, smarter safer building, and the mitigation of long term risks.
- Encourage the use of natural infrastructure such as marshes and dunes wherever possible to absorb storm surges and riverine flooding, and lessen the impact of waves.
- Explore the use of public-private finance options to pay for disaster mitigation.
- Ensure FEMA's limited hazard mitigation funds are being spent on mitigation efforts that truly reduce disaster losses rather than expensive floodwalls, levees, and other so-called "grey infrastructure" that is within the purview of other agencies with larger budgets.

Fortify Infrastructure:

- Protect federal infrastructure with the development and enforcement of smarter and safer mitigation standards, including adoption of recently updated federal flood risk management standards.
- Require communities that access pre- and post disaster funds to have plans in place to rebuild or repair public infrastructure in smarter safer ways.
- Explore the use of private-sector financial tools such as insurance and catastrophe bonds to shield publicly owned infrastructure from catastrophic, taxpayer-funded liabilities in case of disaster.

Reform Flood Insurance:

- Phase in National Flood Insurance Program premiums to risk based rates and ensure flood maps are accurate and informed by the best available science.
- Provide subsidies only for those who truly cannot afford risk-based rates through a means tested, time-limited, and transparent system outside of the rate structure.
- Encourage mitigation by expanding the Community Rating System and increasing the number of enrolled communities.
- Ensure that private sector insurance can compete to cover a greater share of risks in disaster-prone communities.

Ensure Equity:

- Mitigate the cost of flood insurance rate hikes with targeted, means-tested, temporary, and paid-for assistance that is outside the rate structure.
- Ensure low-income communities and households are able to fully participate in federal mitigation efforts and implement a clear plan to help lower-income communities bear the cost of planning, preparedness, and mitigation and make sure disaster relief flows to areas of greatest need.

Improve Coordination:

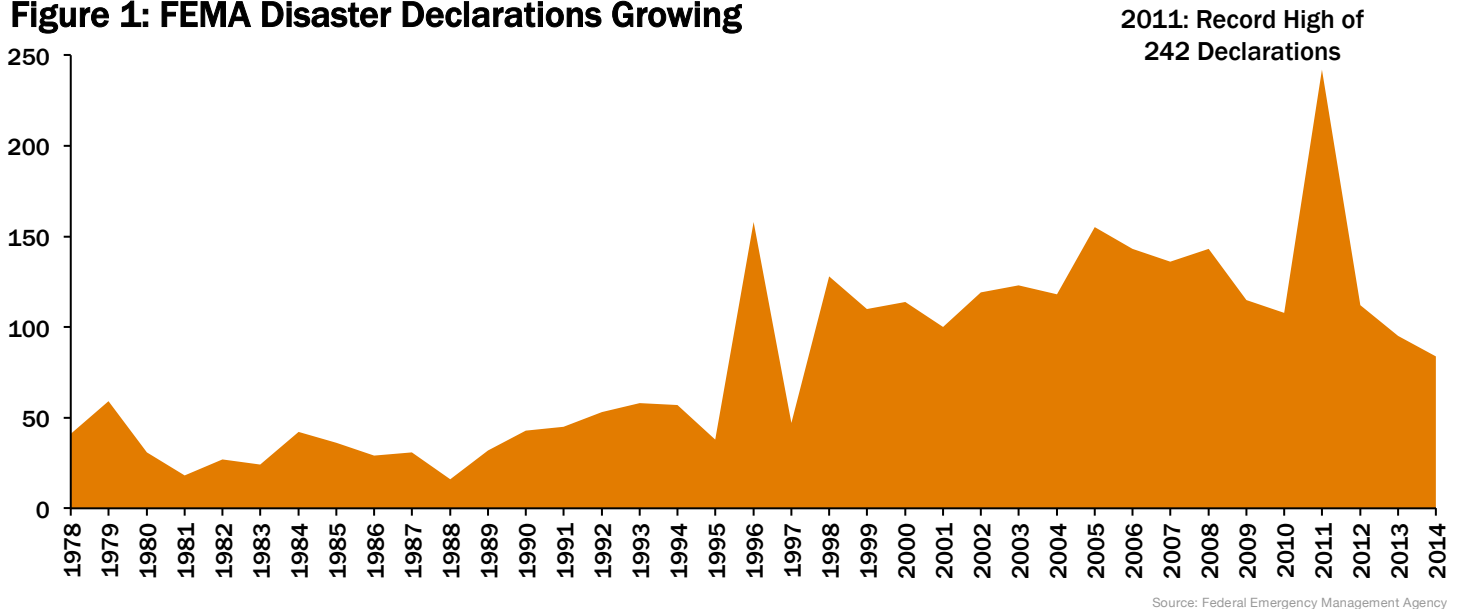
- Establish a central, high-level federal office to better coordinate emergency response and preparedness.
- Set clear roles for federal government, state and local governments, community organizations, and individuals when it comes to disaster activities ranging from planning to mitigation, response, and recovery.
- Better bridge silos among advocates working in water quality, climate change, and floodplain management.

This report lays out a roadmap to a more rational approach to federal disaster policies that will save taxpayer dollars, protect the environment, and better prepare all Americans for the risks they face. With all signs pointing to a more dangerous, disaster-prone future, it is vital that the federal government starts preparing for these changes immediately.

DISASTERS RISKS ARE MULTIPLYING

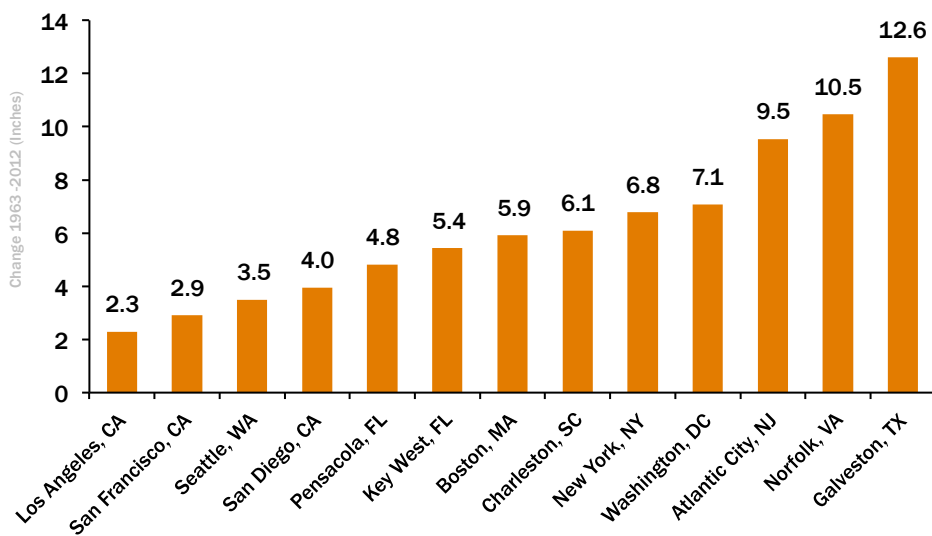
Natural disasters have grown in both frequency and severity in recent decades. The number of presidentially issued disaster declarations has risen steadily since the Federal Emergency Management Agency (FEMA) was created in 1978 (See Figure 1). From 2004 to 2014, an average of 132 disaster declarations were issued annually – compared to about 40 in the period from 1984 to 1994.¹

Figure 1: FEMA Disaster Declarations Growing



In the past six decades, sea level rise have affected a growing number of communities across the country by making minor coastal flooding—also called nuisance flooding—both more frequent and longer-lasting.² In the 1950s, nuisance flooding along the Atlantic, Gulf, and West Coasts typically occurred less than once per year at any given location. Today, that

Figure 2: Where Sea Levels Are Rising Fastest



flooding occurs, on average, about once every three months.³ Some communities in the Chesapeake Bay region and coastal New Jersey currently experience 30 to 50 nuisance flooding events each year.⁴ (See Figure 2) The number of days with this kind of flooding has risen, in some cases, up to four-fold since 1970. The impacts of such nuisance floods include road closures, lack of access to homes and businesses, and overwhelmed stormwater drainage systems.⁵

Rivers also are increasingly [prone](#) to flooding as a result of heavier, more sustained periods of rain and earlier snowmelt.⁶ In the Pacific Northwest, for example, snow now begins melting five to 20 days earlier than it did 50 years ago. Devastating floods on the Red River in North Dakota in 2009 and in northern Colorado in 2013 are emblematic of the growing risk of major flood events.

The 2013 National Climate Assessment found that periods of very heavy precipitation (defined as more than 0.30 inches per hour) had [increased](#) in every region of the country except Hawaii since 1958, particularly in the Northeast (71 percent increase) and the Midwest (37 percent increase). Urban flooding issues are also becoming more common, as major metropolitan areas see storm water systems overwhelmed by increasingly frequent extreme precipitation events, like the Chicago area experienced in 2013.⁷

Heat waves and wildfires may also be on the rise. Temperatures in the American West, the epicenter of wildfire activity, have [gone up](#) about twice the global average since 1970, expanding the annual wildfire season from an average of five months to seven months.⁸ Increased development has also put more structures in the way of wildfires. As a whole, the annual number of wildfires has increased by more than 75 percent.

While climate shifts manifest in different ways, their overall effect is grim. More costly disasters and greater uncertainty await nearly every region of the country.



Credit: U.S. Air National Guard

Case Study: 2013 Colorado Floods

In September 2013, northern Colorado was inundated with more than a foot of rain, leading to deadly flash flooding that damaged as many as 2,000 homes and killed eight people. The National Flood Insurance Program later needed to pay out [more than \\$67 million](#) in claims. The Western Regional Climate Center [found](#) that 9.08 inches of rain fell on September 12, nearly double the previous single-day record of 4.8 inches set in 1919, and Boulder's Cooperative Institute for Research in Environmental Sciences (CIRES) [called](#) the floods "unprecedented," saying changing climate conditions could have exacerbated the flooding by "making slightly more water vapor available for precipitation."

A GROWING TOLL

Major disasters are growing more commonplace, but federal policies have not kept pace with increasing risks. The federal government is increasingly taking on the burden of responding to natural disasters. This trend can be tied to the current version of the Stafford Act, which makes it easier for states to appeal for disaster assistance. When a disaster is declared, the federal government is accountable for at least 75 percent of the costs. The number of disaster declarations has steadily escalated since the act was passed in its current form in 1988, growing to a record 242 in 2011 from just 16 in 1988. The federal share of disaster spending has risen from a mere 23 percent of all spending for Hurricane Hugo to 80 percent of the aid doled out after Hurricane Sandy⁹ (See Figure 3).

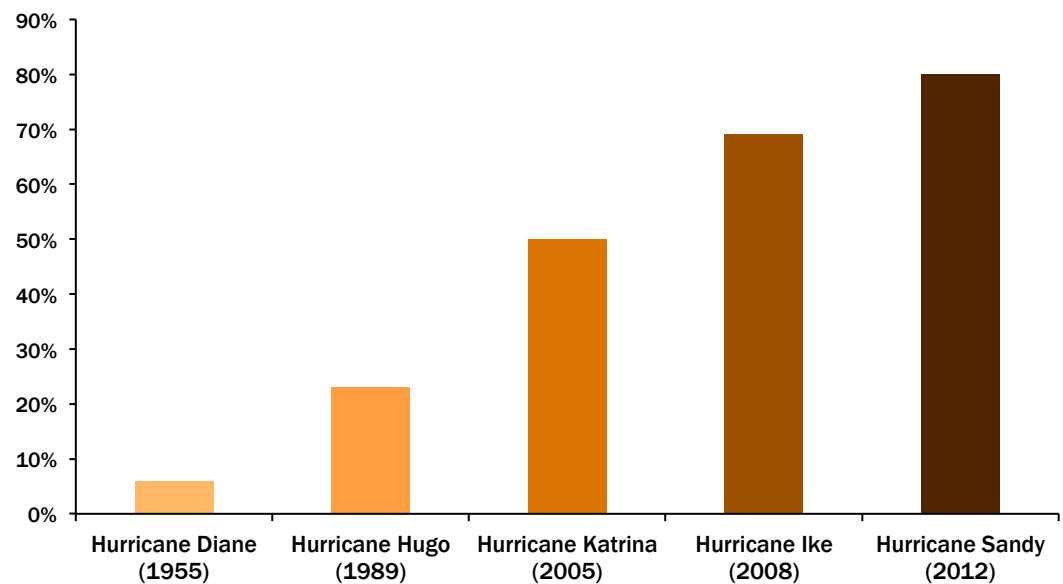
The Stafford Act has a vague threshold for categorizing a disaster as worthy of a federal declaration. A declaration is to be issued following an event “of such severity and magnitude that effective response is beyond the capabilities of the state and the affected local governments and that federal assistance is necessary.” This opaque language has made it easier to politicize the granting of disaster declarations.¹⁰

Disaster relief is approved more often in presidential election years than in off years, [particularly](#) if an incumbent is running.¹¹ President Bill Clinton issued 75 major declarations in 1996, versus 32 in 1993;

President George W. Bush issued 68 declarations in 2004 versus 45 in 2001. States with a higher electoral importance such as California and Florida are also more likely to be issued presidential disaster declarations.¹²

With the federal government taking on such an enormous share of the financial burden and nearly all recovery responsibility, there is little incentive for disaster-prone states to take action to reduce risk. For example, Disaster-prone states like Texas and Louisiana are among those [spending](#) the least of their state budget on emergency response and mitigation programs that can reduce disaster costs.¹³

Figure 3: Federal Share Of Disaster Spending Growing



“Floods are acts of God, but flood losses are largely [acts](#) of man.”

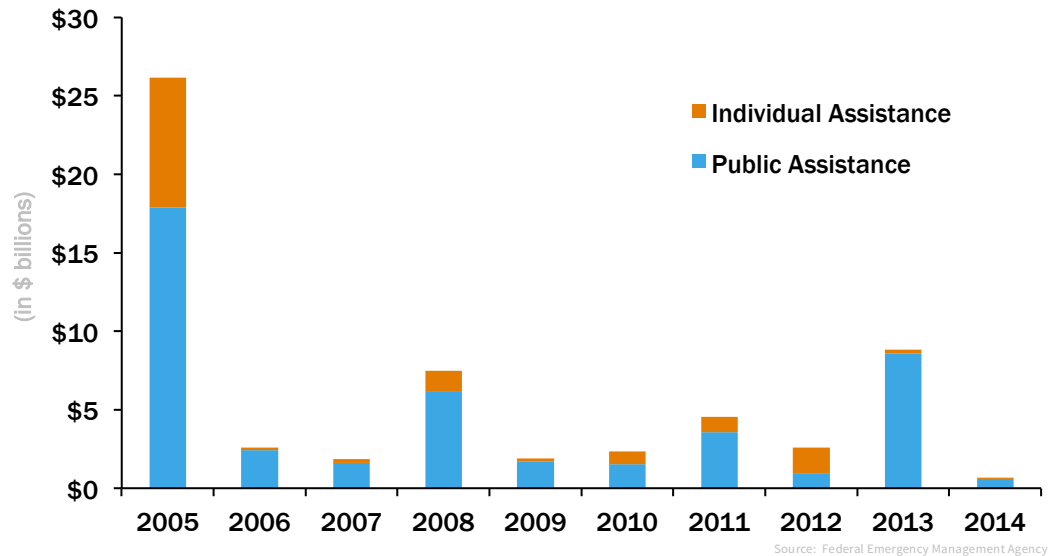
-Dr. Gilbert White,
Environmental Geographer

More federal disaster response aid does not necessarily enhance public safety and makes it easier for states and local communities to underinvest in mitigation. The Wharton School’s Risk Management and Decision Processes Center has shown residents in zip codes that receive significant disaster aid are prone to drop insurance coverage, resulting in an overall decline of \$17,000 on average. For every additional \$1,000 in individual assistance grants provided by the federal government, insurance coverage declines by about \$6,400.¹⁴

It should be noted that individual assistance grants, which are used to finance temporary housing, medical help, crisis counseling, and unemployment assistance, have narrowed over time. Instead, FEMA aid increasingly flows to larger-scale “public assistance” projects, which are used to repair infrastructure like schools, public property, and government facilities. Despite all the spending on disasters, citizens who rely on FEMA aid to recover after a disaster are not accessing funds they need to rebuild. (See Figure 4)

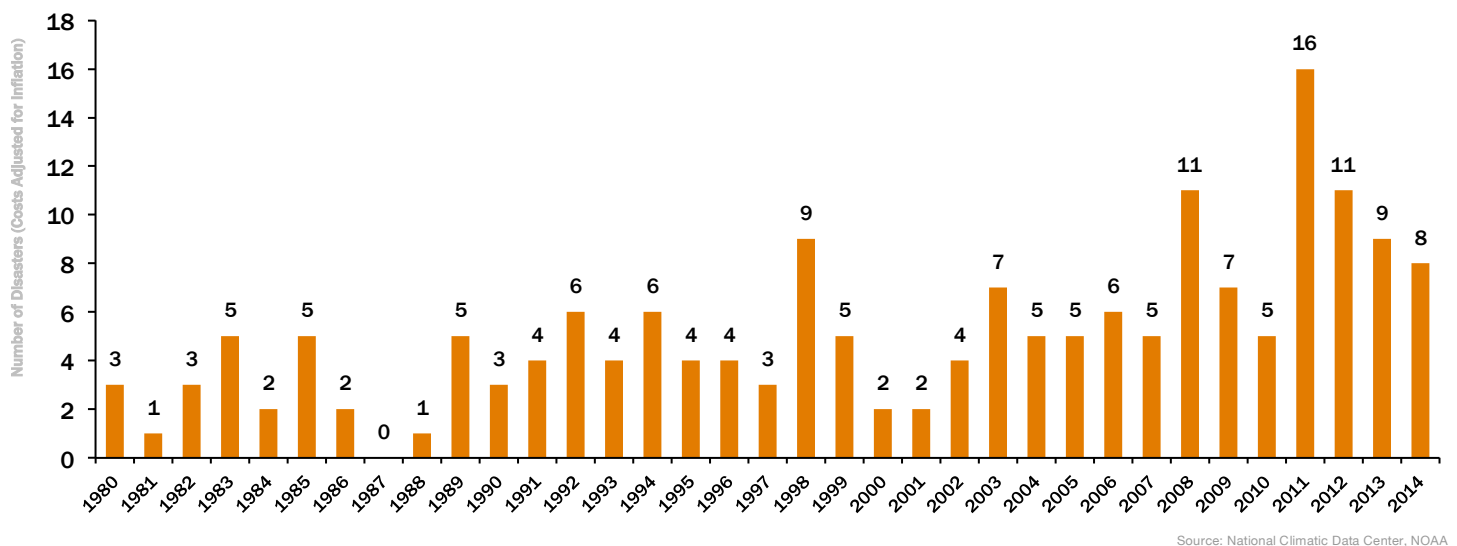
In the meantime, the potential for catastrophic damage is growing worse. With more Americans moving into disaster-prone areas, property damage from disasters has averaged \$24 billion per year since 2004, compared with an annual average of \$9 billion from 1995 to 2003.¹⁵ Most importantly, “billion-dollar disasters,” once a rarity, have multiplied in recent years. These super-size events

Figure 4: Less FEMA Aid Goes To Help Individuals



account for roughly 80 percent of total disaster recovery spending.¹⁶ (See Figure 5) From 1980 to 1999, the U.S. experienced approximately four of these disasters annually. Since 2000, the number has nearly doubled to an average of seven per year.¹⁷ In 2011 alone, a record 16 billion-dollar disasters hit the U.S., including Hurricane Irene and flooding along both the Missouri and Mississippi rivers. Disaster relief consequently grew from a median of \$6.2 billion during the years 2000-2006 to a median of \$9.1 billion during the years 2007-2013, a 46 percent increase.¹⁸

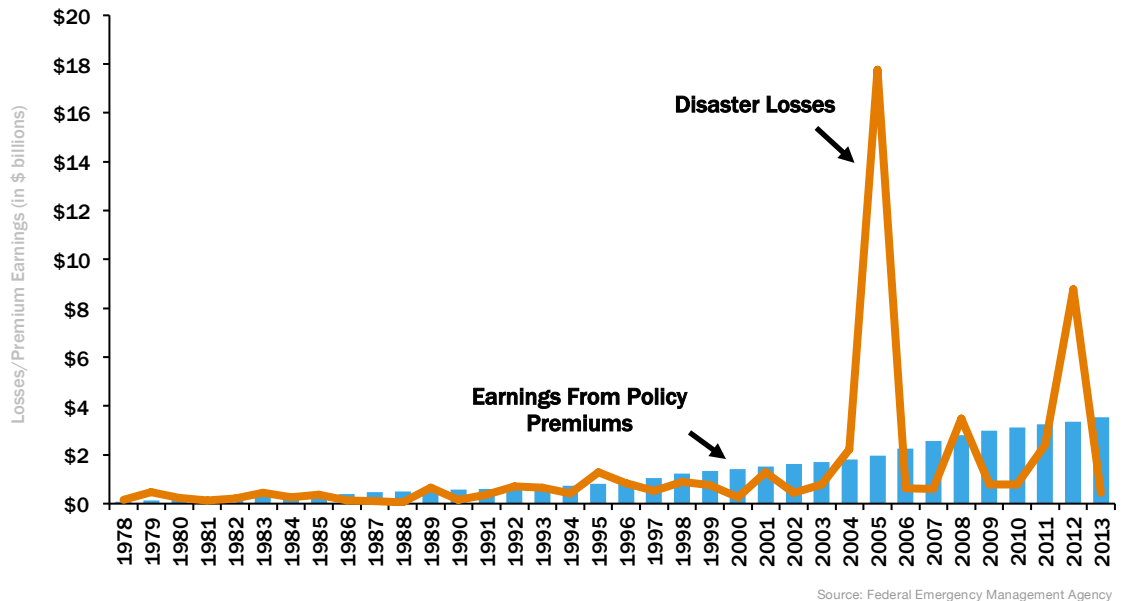
Figure 5: "Billion-Dollar Disasters" On The Rise



Floods and hurricanes are increasingly straining the financial health of the National Flood Insurance Program, a FEMA program created in 1968 to insure properties for flood risk. In recent years, the program has been hit with [astronomical losses](#) from a series of powerful storms, including Superstorm Sandy (\$7.9 billion), Hurricane Irene (\$1.3 billion), and Hurricane Katrina (\$16.3 billion).¹⁹ As a result, the NFIP has [accumulated](#) \$23 billion in debt as of December 2014.²⁰

Figure 6: NFIP Losses Exceed Revenue

Historically, this debt has been financed by the premiums policyholders pay to the program (See Figure 6). These premiums, however, have lagged behind payouts. In 2013, the program earned just over \$3.5 billion in policy premiums from consumers. At this rate, it will be difficult to eliminate the program's debt without further policy changes.²¹ Two years before Superstorm

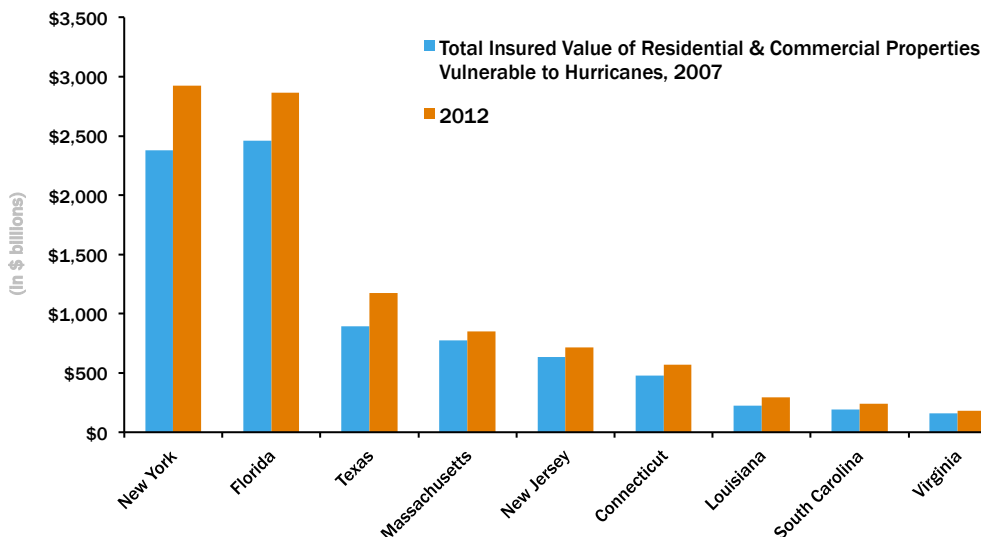


Source: Federal Emergency Management Agency

Sandy made landfall, FEMA Administrator Craig Fugate warned that the agency was “unlikely to pay off its full debt, especially if it faces catastrophic loss years.”²²

Costs are also increasing for other federal programs. The cost of fighting wildfires has [shot up](#) nearly fourfold since 1985, from \$440 million to more than \$1.7 billion in 2013. In 1991, only 13 percent of the U.S. Forest Service budget went to managing fires; in 2012, it was 40 percent.²³

Figure 7: More Coastal Property Value At Risk



Source: Insurance Information Institute

The growing severity of disasters only partially explains their spiraling costs. Another big driver of cost has been more Americans moving directly into harm's way, living on the coasts or in areas threatened by wildfires.

A 2014 Reuters investigation [found](#) that 2.2 million new housing units were built in coastal areas between 1990 and 2010. Today, one-third of the U.S. population, comprising more than 100 million people, live in low-lying coastal regions.

²⁴ As of 2012, AIR Worldwide had [calculated](#) the total insured value of coastal residential and commercial property was \$10.6 trillion, up from \$8.9 trillion in 2007, a 20 percent increase in just five years²⁵ (See Figure 7).

Coastal properties take a disproportionate toll on the National Flood Insurance Program partially because rates are not based on risk, and flooding events do not lead to increased rates. NFIP provides coverage for such “severe repetitive loss” properties regardless of how many times a home or business has been destroyed. While the number of properties (single-family properties with [more than four claims exceeding \\$5,000 each](#))²⁶ is small – only about [9,000 properties](#) as of September 2013²⁷ – their financial impact is large. For example, In Massachusetts, a mere 150 properties in the affluent coastal town of Scituate have [accounted](#) for more than 40 percent of the \$60 million in flood insurance payouts to the town since 1978.²⁸ Overall, severe repetitive loss properties have historically [made up](#) more than a third of NFIP’s claim costs since 1978, despite making up only 1 percent of properties insured.²⁹

More Americans are also living in the path of wildfires. The number of housing units in the U.S. “wildland-urban interface” has [risen](#) 52 percent since 1970. Today, more than 1.2 million homes in western states are at high or very high risk of wildfires, with a total estimated property value of more than \$189 billion.³⁰

Credit: Shannon Kaestle, Miami Herald



Case Study: Magnifying Risks in Miami

The City of Miami, sitting on a flat and porous plain, will be particularly affected by changing climate conditions. The Organization for Economic Co-operation and Development has called Miami the most vulnerable city on Earth, with \$416 billion in assets at risk for flooding and sea-level rise. Sea levels around South Florida are rising faster than the rest of the country, [going up](#) 12 inches since record keeping began in 1880, compared with an average of 8 inches around the world. They are [projected](#) to rise as much as an additional 2 feet by 2060. The city’s Biscayne Aquifer, the source of the city’s drinking water, will likely be [threatened](#) by saltwater intrusion. Yet the city is growing faster than ever. In 2014, Miami [took in](#) \$128 million in property taxes, up from \$117 million in 2013, and began construction on 12 new condo towers. If current trends continue, even more of the city could be at risk when the next hurricane hits.

DISASTER TRENDS WILL CONTINUE

Current trends show no signs of abating. By the end of the century, the National Oceanographic and Atmospheric Administration has [projected](#) an additional global sea level increase of anywhere from 8.4 inches to 6.6 feet above 1992 levels.³¹ Heavy downpours that now [occur](#) once every 20 years will happen more often, potentially as frequently as once every four years.³²

The stress on property and infrastructure will likely grow. A number of studies have looked at increased losses due to hurricanes in coming years. By 2100, these studies estimate losses could [grow](#) by about 54 percent to 110 percent.³³ The Natural Resources Defense Council has [estimated](#) that floods could cost the United States as much as \$360 billion in damaged residential real estate and \$422 billion in hurricane damage by 2100 if current trends continue.

Stronger floods will further strain the National Flood Insurance Program. Coastal areas considered to have a 1 percent risk of flood are projected to grow by 55 percent (45 percent for rivers), as a result of population growth and changing conditions. Resulting losses are projected to grow about 50 percent by the year 2100.³⁴

Finally, fiercer wildfires can be [expected](#) in the future. The Department of Agriculture has predicted an up to 100 percent increase in the number of acres burned annually by 2050, threatening to weaken the nation's food security.³⁵

In short, we face a costlier and more unpredictable future. With the risks so apparent, action must be taken now to curb the harshest effects.

“We [refer](#) to climate change as a ‘threat multiplier’ because it has the potential to exacerbate many of the challenges we are dealing with today – from infectious disease to terrorism.”

-Former Secretary of Defense Chuck Hagel

DISASTER POLICY DOES NOT REFLECT GROWING RISKS

Despite the growing threats to property, infrastructure, and the federal budget, the government has yet to catch up with the changing landscape of disaster risks. Federal disaster policy fails to anticipate damage in advance, subsidizes development located in harm’s way, and offers insufficient incentives for mitigation. These policies unnecessarily raise the costs of each new disaster and make it harder to rebuild.

Lack Of Support For Mitigation

Mitigation, or reducing the risks associated with natural disasters, has been proven to save money in the long run. These activities include hazard mitigation planning, enforcement of building codes and the maintenance of flood protections such as wetlands, barrier islands, and dunes. A 2007 study of more than 5,000 FEMA mitigation grants found the federal government saved an average of \$4 for every \$1 invested in mitigation. For flood mitigation, the ratio was \$5 to \$1.³⁶ Numbers like these are one reason communities across the country from New Jersey to Louisiana have initiated mitigation projects like buying out properties at the highest risk of destruction, raising homes, and providing tax incentives to buy supplies that can mitigate the impact of a storm.

Yet the federal government has done little to encourage such efforts (See Figure 8). In fact, Congress has moved in the opposite direction, providing less funding and fewer incentives for mitigation. Spending on programs like pre-disaster mitigation grants has [declined](#) precipitously in recent years.³⁷ In the same year Superstorm Sandy struck and required an emergency \$60 billion aid package, only \$70 million was spent on mitigation.

FEMA has also weakened existing incentives to mitigate. In 2014, for example, FEMA quietly implemented a policy change to allow hazard mitigation programs to spend part of their budget on large-scale flood control structures like levees and flood walls. These types of structures historically had been handled by the Army Corps of Engineers and were never before approved as acceptable mitigation projects by FEMA.³⁸ The problem is that they can often [provide](#) a false sense of security and lure people to risky, flood-prone areas. A suburb of St. Louis, for example, saw new construction nearly triple after construction of the Monarch-Chesterfield Levee in 1983.³⁹ Just 10 years after it was constructed, the levee broke during the Great Flood of 1993, inundating 15 square miles and forcing the evacuation of 42,000 residents.⁴⁰

Figure 8: Spending on Disaster Recovery v. Mitigation

(in \$ millions)	FY11	FY12	FY13	Total
Disaster Recovery	\$21,376	\$32,412	\$14,321	\$68,109
Mitigation	\$243	\$197	\$71	\$510

Source: Center for American Progress (excludes supplemental appropriations)

The availability of federal assistance, particularly individual assistance, can also skew incentives away from mitigation. The Government Accountability Office has long warned that the ready availability of federal aid, combined with widely available insurance discounts, can mask the growing risks residents face.⁴¹ With no unified federal policy to guide mitigation, a growing patchwork of laws governs state disaster response, and federal disaster aid is often approved without stronger requirements to prevent future damage.

The government’s record on mitigation also extends to fires. The Forest Service’s budget is still heavily [skewed](#) toward suppression of fires rather than preparation. The agency has also been criticized for putting the burden of its costs on the federal government, a move that encourages development in fire-prone areas.⁴²



Credit: Stan Honda, AFP/Getty Images

Case Study: Sandy Spending

Over the past two years, a number of reports have revealed shortcomings in the FEMA recovery aid for damage caused by Superstorm Sandy in 2012. Many of these problems can be traced back to the original aid package, passed with insufficient scrutiny in a rush to get aid out the door. Many provisions could not [legitimately](#) be called emergencies, including \$2 billion for improving highways across the country, \$118 million on non-Sandy related Amtrak repairs, and \$25 million to improve weather forecasting, among many others. A year after the storm hit, only 11 percent of the aid package had been [spent](#). Federal regulators [pinned](#) the blame partially on a lack of controls in the original aid package, which made it difficult to track the flow of funds.

growing disaster threat. In a [study](#) of Department of Defense facilities such as Pearl Harbor and Edwards Air Force Base, the Government Accountability Office found that 14 of 15 facilities studied had not addressed changing conditions, despite nearly half reporting they had observed the effects of rising sea levels and increased storm surge.⁴⁴

NASA facilities, [66 percent](#) of which are located within 16 feet of mean sea level, are vulnerable to weather events as well⁴⁵ (See Figure 9). NASA recently presented a plan to begin addressing climate risks in 2014.

Energy infrastructure is also underprepared. The Congressional Research Service has estimated that weather outages [cost](#) the U.S. economy \$20 billion to \$55 billion annually. A study of electric outages between 1992 and 2010 found that 78 percent of electric grid disruptions were caused by weather conditions such as thunderstorms, hurricanes, and lightning.⁴⁶

Rising seas and falling coasts also threaten the nation's oil supply, which is heavily concentrated in Gulf Coast states. Approximately [40 percent](#) of U.S. oil refining capacity can be found on the Gulf Coast, with about 23 percent in Texas.⁴⁷ Hurricanes Katrina and Rita collectively [destroyed](#) 113 offshore oil and gas platforms and damaged 52 others, as well as 457 oil and gas pipelines.⁴⁸ The fastest sea-level rise in the country is occurring near Galveston, home to a refining plant run by

Inadequate Coordination

As the chaos following incidents like Hurricane Katrina has demonstrated, the lack of a clear division of responsibility can stymie recovery and put lives at risk. With nearly 20 federal agencies playing roles in disaster relief, the potential for miscommunication is high. The administrative costs of handling disaster declarations have skyrocketed, doubling from 9 percent to 18 percent of total costs from fiscal years 1989 to 2011. Moreover, FEMA frequently overran its own cost estimates, with 37 percent of declarations from 2004 to 2011 beyond the targets set by the agency.⁴³

The gaps in coordination also manifest themselves in the passage of disaster aid. With an emergency hanging over their heads, disaster aid can too often get approved without sufficient oversight to ensure funding is tied to stricter mitigation requirements. The aid package for Superstorm Sandy, for instance, was a perfect example of this trend, ushering in a host of non-emergency spending provisions and a lack of measures to improve resiliency over the long haul.

Infrastructure Exposed To Disaster Risks

Critical national security infrastructure is unprepared for the

Figure 9: NASA Field Centers and Components Sites



Credit: Government Accountability Office

Valero, the nation's largest oil refiner.⁴⁹ And Louisiana's State Highway 1, the only road leading to a port that supports nearly a fifth of the nation's oil supply, could be submerged for nearly a month annually within the next 15 years.

Finally, iconic sites around the country face risks that could endanger their tourism economies. The Union of Concerned Scientists has identified 30 national monuments and critical infrastructure that are [threatened](#) by floods, hurricanes, and fires, ranging from the Statue of Liberty to Boston's Faneuil Hall to Mesa Verde National Park.⁵⁰

National Federal Flood Insurance Program Facing Insolvency, Reform Efforts Overturned

The National Flood Insurance Program includes federal subsidies that purposefully hold down rates regardless of risk and regardless of need. In some areas, rates are as low as [45 percent of the full level of risk](#).⁵¹ More than 40 years after the program's inception, these subsidies are threatening to undo the program altogether by making it impossible to pay for the damage of major storms such as Katrina and Sandy. The Biggert-Waters Flood Insurance Act of 2012, passed with widespread bipartisan support, was intended to phase out many subsidized rates, restore NFIP to solvency, and provide better price signals to consumers about their risk.

In 2013, however, driven by reports of astronomical flood insurance premium increases, members of Congress scaled back many of the Biggert-Waters reforms. In the end, new legislation slowed down rate increases and grandfathered in old rates for properties newly mapped into riskier flood zones. To address the NFIP's debt issues, surcharge fees were added to property rates, ranging from \$25 for primary residences to \$250 for secondary homes, shifting the burden from riskier properties to those less at risk.⁵²

As a result, NFIP's \$23 billion debt will continue to rise, and costs are shifting away from those who have chosen to live in the riskiest areas. The Brookings Institution has estimated that reforms to NFIP could save the federal government \$40 billion over the next 10 years.⁵³

Today, some lawmakers are still attempting to roll back reforms that were widely accepted as necessary, such as the end of subsidies for second homes.⁵⁴ Without common-sense changes to the existing rate structure, however, NFIP's sizable liability cannot be paid down. Moreover, the use of surcharges ensures the cost of risk falls on all policyholders, rather than being distributed fairly to those who face the highest risks. Most importantly, below-risk rates, coupled with a cap on rate increases, will continue to underprice the cost of development in flood-prone areas.



Credit: NOAA

Case Study: Louisiana State Highway 1

One of the oil industry's key operations centers is located at Port Fourchon, at the southern tip of Louisiana. The port services 18 percent of the country's oil supply. The only road access is provided by Louisiana's State Highway 1, which snakes through the delta nearly at sea level. The National Oceanic and Atmospheric Administration has [estimated](#) that segments of the road could be inundated by tides an average of 30 times annually in 15 years. A closure of 90 days could result in GDP losses of \$7.8 billion. In 2012, the state [began](#) a costly two-part elevation of the expressway, but has been unable to secure the federal funding necessary to complete the project. Federal officials have said the state must pledge its full share of funding — \$320 million, or one-third of Louisiana's total construction budget — before the federal government can chip in.

BLUEPRINT FOR REFORM

SmarterSafer has outlined a blueprint to make federal disaster policy more proactive in an effort to protect lives and property and save tax dollars, making federal disaster policies as a whole more fiscally and environmentally sustainable. By reforming the federal policies to stop incentivizing moral hazard, improving coordination, encouraging mitigation, and other reforms, this framework strives to contain future risks.

Reform Federal Disaster Aid To Enhance Mitigation

Federal disaster resources must be shifted to “presponse,” or budgeting before a disaster strikes to plan for and mitigate known risks. Such a shift can make disaster response more equitable, lifting the burden on those communities that have few resources to mitigate risks on their own. Though there are budgetary barriers to achieving this goal, it is necessary given the growing impact of disasters and their disproportionate impact on low-income communities. Spending less on the back end can alleviate the financial and physical impact of disasters and improve equity.

Moreover, rather than simply writing a blank check after every disaster, disaster assistance must be provided on a sliding scale so that communities can get a full share of funding only if they have taken significant steps to protect its residents from harm. Spending must be tied to concrete results, such as smarter and safer building and the use of natural infrastructure. Communities that access disaster funds should be required to submit, implement, and enforce mitigation plans that take into account future conditions. However, the shift should be accompanied by assistance for lower-income communities that need assistance in meeting their mitigation and planning needs.

FEMA’s Community Rating System (CRS) is an example of where the federal government incentivizes local planning and mitigation activities. The CRS is an incentive program that recognizes and rewards community floodplain management that exceeds minimum requirements set by NFIP. To qualify for the CRS, municipalities voluntarily take on initiatives to reduce overall exposure to flood damage, such as resident education programs and stricter building regulations. Improvements give a municipality a specific number of points, which can then be used to lower residents’ flood insurance premiums.⁵⁵

[Dauphin County, Pennsylvania](#),⁵⁶ [Jersey Village, Texas](#),⁵⁷ and [Biloxi, Mississippi](#),⁵⁸ are examples of areas that experienced significant flood damage and submitted proposals to the CRS because residents and elected officials recognized their continued flood vulnerability and its associated financial and psychological burdens. These communities have begun making significant improvements that will mitigate the scope of future damage. However, there is still significant progress to be made: there are only 1,313 communities currently in the CRS program, and only a single community has earned the program’s highest ranking.⁵⁹



Case Study: Pennsylvania Mitigation

Pennsylvania is the second-most flood prone state in the U.S. To better respond to growing floods, 21 municipalities in [Dauphin County](#) signed on to join the county’s Community Rating System. With the Susquehanna River and Swatara Creek running through the county, these towns account for more than 46 percent of the 3,255 flood insurance policies in Dauphin County, and residents in these communities pay more than \$4.5 million in annual flood insurance premiums. After a lengthy exploratory process to highlight vulnerabilities, these communities will begin the process of educating residents, mapping floodplains and implementing other mitigation solutions. Once the process is complete and reviewed by FEMA, residents in these counties are expected to save 5 - 45 percent off their insurance premiums.

As states and localities take on more responsibilities, however, the federal government must not be left off the hook. In fact, the federal government should spend more on mitigation to help communities better prepare. This can be achieved with updated flood maps that are accurate and reflect the best available science, individual incentives like Disaster Savings Accounts to allow homeowners to set up tax-preferred disaster preparation accounts, and by not diverting mitigation funds to large-scale projects. Spending on the front end, before a disaster strikes, ensures communities need less on the back end, alleviating the burden on lower-income communities.

Encourage Smarter, Safer Building

Federal infrastructure, as well as state and local projects paid for with federal funds, must be made more resistant to harm. Disaster mitigation standards should be incorporated into federal investments so that expenditures are protected. Federal policy and funding must emphasize and encourage cost-effective pre-disaster mitigation, ultimately resulting in less damage and less spending on cleanup and recovery. Particularly in this era of constrained budgets, federal funds — whether provided through disaster assistance, [Community Development Block Grants](#), or other programs — should be directed to outcome-driven projects that strengthen communities and reduce risk over the long run. Mitigation should be integrated into all pre- and post-disaster and recovery spending.

The Obama administration's recent adoption of increased flood standards is a positive first step. The new policy directs agencies to explicitly take future flooding risks into account in the planning and construction of federal projects.⁶⁰ It also encourages agencies to utilize and strengthen natural flood defenses such as barrier beaches wherever possible. These kinds of standards can help reinforce infrastructure for the long run.

Rather than simply relying on taxpayer funds to rebuild, federal entities, states, and localities should consider insuring infrastructure. Insurance sends proper signals about risk and encourages development of safer and more resilient infrastructure. New York's Metropolitan Transportation Authority, for example, maintains its own insurance company, which [covers](#) the first \$25 million of property damage caused by a disaster as well as up to \$1 billion in losses from reinsurers.⁶¹ In 2013, the agency sold a \$200 million catastrophe bond, an effective vehicle to insure against storm damage.⁶²

Federal efforts must also ensure that lower-income communities and lower-income residents are able to fully participate in mitigation efforts. As funds are shifted pre-disaster, and post-disaster funds are linked to community planning and mitigation, measures must be implemented to ensure low- and moderate-income communities can build to and enforce appropriate standards and spending must be linked with clear long-term savings. Federal programs should provide incentives for mitigation, while understanding that lower-income communities may lack sufficient resources to carry out more ambitious plans.



Case Study: NYC Building Codes

Superstorm Sandy exposed an array of holes in New York City's preparedness for storms, including the [outdated building codes](#) for the 68,000 buildings in the city's floodplain. In 2013, the city took a major step toward reform, passing 16 different updates to the existing code as part of a greater program of resiliency. The new codes [included](#) a requirement to install hookups allowing for immediate access to generators and boilers; mandatory faucets in common areas on higher floors to provide access to clean water in case of a storm; and easing regulatory hurdles to elevation of building necessities like fuel storage tanks. The legislation also directed the city to adopt the best available flood maps. The new laws were [cheered](#) by property owners and trade groups like the Real Estate Board of New York.

Expand Use Of Natural Defenses

Additionally, the federal government should do more to preserve natural landforms that are effective, underutilized forms of disaster risk reduction. The government should ensure that any spending encourages

Side Bar: Natural Storm Barriers



Credit: Marine Wikia

Salt Marshes

[Salt marshes](#) are a type of natural barrier that is vital to protecting areas of Florida's coast along both the Gulf of Mexico and the Atlantic Ocean.

Salt marshes are [coastal wetlands](#) flooded and drained by water brought in by tides. They are essential for healthy fisheries, coastlines, and communities. Because of their vast land area and ability to absorb large quantities of water, salt marshes protect inland areas by reducing wave height and energy, reducing flood peak levels and durations, and reducing erosion. An acre of salt marsh wetland can store approximately 1 million gallons of water, and for every 9 miles of saltmarsh there is a 3.3 feet reduction in storm surge. The economic savings from salt marshes throughout the country for coastal protection is [estimated](#) at \$23.2 billion per year.



Credit: North Carolina Coastal Federation

Oyster Beds

The mass of oysters and rocks that comprise an [oyster reef](#) act as a natural barrier to absorb much of the impact of waves and incoming water, which otherwise would lead to increased erosion and shoreline damage.

Historically, oyster beds near New York and New England have acted as a barrier by stabilizing shores. Over the past 100 years, the oyster population has plummeted as a result of pollution, disease, and harvesting. This decline heightens the risks of storm surges around New York. In the aftermath of Sandy, [oyster reefs](#) have been proposed as a natural solution to mitigate the intensity of waves and storm surges. Oysters also filter water by removing pollutants - one oyster can filter up to 50 gallons of water a day - resulting in healthier water that encourages marsh grass to grow, further protecting shorelines. Oyster beds are also a more affordable alternative to non-natural barriers.



Credit: UTMB Health

Dunes and Beaches

[Dunes](#) are considered to be the least expensive and most efficient barrier against storm erosion and surge.

In Galveston Island, Texas, the dunes along the Gulf of Mexico have long protected the beaches and inland areas from tropical storms and wave impact. As a result of stronger wind and wave impacts, however, these dunes have suffered from erosion. During the 2002 tropical storm season, areas of Galveston Island [suffered](#) from 3-4 foot storm surges. In response, communities in Galveston Island constructed supplemental artificial dunes to strengthen the natural dunes that were no longer able to adequately protect the shoreline, allowing the dunes to protect coastal property and prevent damage.

natural infrastructure that yields additional protection. Ecosystems like barrier beaches can reduce the impact of hurricanes and floods, absorbing the storm surges before they reach homes and businesses. Such systems can reap significant savings, be it in New Jersey, where freshwater wetlands have been estimated to save \$3 billion in storm surge and other costs,⁶³ or along the Charles River in Massachusetts, where wetlands have been estimated to cost one-tenth that of a dam and levee project.⁶⁴ (See Side Bar)

Improve Coordination

Federal and state agencies need to act as one in the event of a disaster. Effectively strengthening the nation's resiliency will require a coordinated, high-level effort. To accomplish this goal, the administration should first and foremost centralize mitigation efforts through a Cabinet-level office or independent agency at the federal level with direct access to the White House. Such an office can act as a hub to ensure federal agencies act in coordinated ways.

There should be a clear plan for how state, local, and federal agencies will coordinate when it comes to emergency response, planning, improving mitigation, first-responder activities, re-housing, aid distribution, and rebuilding. Clear roles must be established for the federal government, state and local governments, communities, volunteers, and individuals to ensure there is a proper division of responsibilities that encourages

mitigation and preparedness. By sharing best practices and clearly delineating roles, the federal government can make it easier to be prepared for the next catastrophe.

Flood Insurance Rates

Flood insurance rates should more closely reflect actual levels of risk, and rates for all properties should, over time, be phased in to reflect risk. Congress should reject efforts to further roll back needed reforms, specifically efforts to continue subsidies for second homes and businesses. While accurate risk-based rates should be the ultimate goal, in the interim there will be some who will struggle to afford higher rates. Congress should consider addressing affordability through financial assistance that is temporary, means-tested, limited to incumbent homeowners at the time the rates go up, and outside of the rate structure. While flood insurance subsidies are currently provided regardless of need, a more effective financial assistance program will be targeted to those who need it, rather than those who can afford risk based rates.

FEMA must also ensure that flood maps are accurate and incorporate the latest conditions. This means that FEMA must address concerns with mapping and consider ways to help communities and policyholders get elevation certificates and other information needed to ensure accurate rates.

Private Insurance Competition

Currently, private insurers are largely precluded from entering the flood insurance market by the below-market rates charged by the federal flood insurance program. With federal flood insurance on shaky ground, a number of states, including Connecticut, West Virginia, and Florida, have passed laws to loosen restrictions on private insurers and open the market to a wider variety of insurance providers. Biggert-Waters reforms, recognizing the value of private insurance competition, included a provision allowing private insurance to count toward the mandatory purchase of flood insurance. Legislation may be needed to clarify this provision, letting financial regulatory agencies and lenders feel more comfortable allowing private options satisfy the requirements for mandatory purchase, while still providing NFIP funding for mapping and mitigation purposes. Homeowners should be permitted to choose private insurance over NFIP.

CONCLUSION

Disasters are beginning to affect communities at an alarming pace, the result of increased development in harm's way as well as changing climate conditions.

The federal government, however, continues to focus on post-disaster response instead of pre-disaster preparedness and mitigation. Current policy sorely lacks incentives for mitigation at the federal, state, local, and individual levels, leading to underinvestment before a disaster hits and soaring price tags after the fact. The federal government shoulders an increasing percentage of the costs, leading to a growing fiscal burden.

Faced with current realities, the federal government needs to pursue forward-thinking policies that confront the risks head on. Federal policy needs a complete overhaul to incentivize mitigation efforts such as the use of natural barriers and smarter and safer building, which have been proven to save lives, property, and taxpayer dollars. Insurance premiums need to be directly linked to actual risk, so that residents in high-risk areas understand and are responsible for their risks, rather than placing the burden on taxpayers far from the path of harm. And in the aftermath of a storm, there needs to be a process in place for determining the amount and use of federal aid that ensures rebuilding is done in smart, safe ways to protect communities and federal investments.

We have seen time and time again how storms like Hurricane Katrina and Superstorm Sandy can ravage communities, causing years of financial and emotional pain. Lawmakers need to understand the dangers of current policy and take real efforts to ensure we are prepared for the risks we will face in coming years. We cannot wait for another disaster to act.

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