



Rebuilding Stronger

12 Priority Policies to Better Protect our Nation from Extreme Storms

“America needs a national, bipartisan commitment to restoring natural defenses and rebuilding stronger. We simply must do a better job improving the resilience of communities to protect against the staggering destruction of extreme storms. An ounce of prevention will save thousands of lives.” —Collin O’Mara, President and CEO

This year has already been an unusually active hurricane season, with more than a dozen named storms, including three hurricanes, less than halfway through the season.¹ NOAA is predicting we may see as many as 24 named storms, double the long-term average.²

Even as 2020’s hurricane season is still ongoing – policymakers are already considering ways they can help prevent similar losses from future extreme storms and catastrophic floods. Ill-planned and unmitigated development in risky areas has put communities in harm’s way, at the same time often destroying the wetlands and other natural features that could have absorbed floodwaters and reduced flooding. The devastation observed during recent storms is heightened by inadequate stormwater management, an over-dependence on outdated flood control infrastructure, and an underinvestment in risk reduction measures that could make homes, businesses, and communities more resilient to natural hazards.

This document outlines 12 policy priorities that would ensure rebuilding after increasingly destructive storms is done right, leading to better protections for people, property and wildlife.

#1 - Prioritize Natural Infrastructure Solutions for Hazard Risk Reduction

In the face of increasing storm frequency and intensity, some of our greatest assets are healthy wetlands, upland forests, floodplains, grasslands, dunes, and other natural systems that buffer communities from storm surge and help retain water to prevent flooding. Science shows that these solutions are effective and cost-effective for reducing risks in the face of natural hazards, as demonstrated in the recent National Wildlife Federation and Allied World report, [The Protective Value of Nature](#). Natural infrastructure should be a key component of solutions to reduce flood and storm risk for coastal and riverine communities.

Natural infrastructure has the added benefits of providing wildlife habitat, typically costing less than structural measures, *and* avoiding the risk of catastrophic failures of levees, floodwalls, or dams. Natural infrastructure solutions can also be used in combination with structural measures to increase levels of protection and improve environmental health.

One of the most effective and simplest steps that communities can take to decrease their vulnerability to storms is to protect and restore these natural areas and open spaces where they still exist. Typically, a one-acre wetland can store about three-acre feet of water, or one million gallons. For example, wetlands prevented \$625 million in flood damages during Hurricane Sandy in the 12 affected coastal states, and reduced damages by 20 to 30 percent in the four states with the greatest wetland coverage.³ In addition, forested and other wetland vegetation slow the speed of flood waters and, combined with wetland flood storage, lower flood heights.⁴

We must also work to integrate, or mainstream, consideration of natural infrastructure solutions across sectors and agencies, ranging from flood mitigation and stormwater management to transportation. For example, the Army Corps must take steps to better implement Congressional directives to consider natural infrastructure solutions for flood

risk reduction where practicable. Agencies like FEMA should also work to ensure that natural infrastructure solutions are eligible and competitive for hazard mitigation program grants.

#2 - Reform the National Flood Insurance Program

One of the stated purposes of the National Flood Insurance Program (NFIP) is to discourage development in high flood risk areas. However, decades of highly-subsidized flood insurance rates have resulted in the opposite effect. In many floodplains and coastal areas, development subsidized by the NFIP has occurred in places that would otherwise have provided natural buffers for storms and floods. This has increased overall community vulnerability, leading to repetitive losses and a ballooning program deficit.

Outdated flood maps contribute to the problem by reflecting historic patterns of flooding rather than current and future conditions. Existing federal flood maps often fail to capture the risks to inland communities in particular, despite a well-documented increase in extreme precipitation events that is resulting in greater flood risks to these communities.⁵ For example, an analysis before Hurricane Florence hit found that only 35 percent of at-risk properties in North Carolina carried flood insurance.⁶

After fifteen short-term extensions of the program as of September 1, 2020, Congress must urgently act to fully reauthorize and reform the NFIP. Any reauthorization should require the Federal Emergency Management Agency (FEMA) to use the most modern science and technology, and risk- assessment tools, to increase the accuracy of flood maps – a vital step toward promoting broader coverage and helping people and communities truly understand their risk. Congress should also encourage increased pre-disaster hazard mitigation efforts including through natural infrastructure, and continue gradually phasing properties to risk-based rates, while providing for mitigation assistance and affordability measures for those who are low-income.

#3 - Increase Investment in Resilience and “Pre-sponse”

Increasing upfront investments through FEMA’s hazard mitigation programs – under both the National Flood Insurance Program and the Stafford Disaster Relief and Emergency Assistance Act – could not only save lives but also significantly decrease

the cost of future disasters. These programs support critical efforts by communities and property owners to enhance their resilience and “pre-pond” to disasters, for example by proactively elevating or relocating structures to reduce risks. According to the National Institute on Building Sciences, every \$1 spent on upfront risk mitigation saves \$4 to \$6 in disaster-recovery spending later.⁷

Some important improvements were made in the 2018 Disaster Recovery Reform Act, resulting in the creation of FEMA’s new Building Resilient Infrastructure and Communities (BRIC) pre-disaster hazard mitigation program, funded with a 6% set-aside of the aggregate total of other FEMA disaster grants. While this new authority should result in a meaningful uptick in pre-disaster spending, much more is needed.

By significantly raising investment in FEMA’s hazard mitigation programs, and including substantial mitigation dollars in any future recovery packages, Congress can help greatly reduce future disaster payouts in these areas. However, it is important for communities to have a variety of tools at their disposal. Creation of a national revolving loan fund for community resilience could provide low- to zero-interest loans for communities to invest in projects and programs that improve disaster preparedness and long-term resilience, with an emphasis on use of natural infrastructure to achieve those goals. To support efforts in lower-income communities, the revolving loan fund should be administered alongside a grant program with aligned goals, or should include a mechanism to ensure access to the program for communities that otherwise would not have the resources available to participate and allow for near-term implementation of solutions.

Local governments, with support and guidance from federal agencies, also should create more resilient construction standards and building codes that will better enable homes and businesses to withstand hurricanes and floods, while incentivizing smart, sustainable land use planning.

#4 - Establish a Federal Flood Risk Management Standard

Congress should establish minimum standards to minimize flood risk to future projects involving federal funds. Setting common-sense, shared requirements across the federal government would save taxpayer dollars and protect communities. Under a federal flood standard, projects built by the federal government, or by states and municipalities using federal funds, should be required to account for future flood risk in their design, using the best available science and data. Where insufficient data exists, agencies should

assume a higher flood level and design the project accordingly. Extra care should be taken when building new critical facilities, such as hospitals, fire stations, evacuation centers, nursing homes and chemical storage facilities, to ensure that they are not vulnerable to flooding.

As recent hurricanes Harvey and Irma demonstrated, placing critical facilities and industrial facilities in areas that readily flood can have devastating, long-term impacts. Rebuilding in the same way, and in the same flood-prone areas, will leave too many suffering flood damages all over again. Any federal flood standard should seek to limit federal development in floodplains, and require agencies to consider natural systems and nature-based approaches where possible when evaluating alternatives for mitigating flood risk.

#5 - Ensure Clean Water Act Safeguards Protect Existing Wetlands, Waterways, and Natural Floodplains

As discussed above, natural infrastructure, such as wetlands, streams, and floodplains, ensures critical natural flood storage and water filtration functions, often providing the first line of defense to communities during extreme storm events. A key tool for ensuring the health of wetlands, waterways, and floodplains is the Clean Water Act, which requires permits for the pollution of waterways and the dredging and filling of wetlands that are under federal jurisdiction. These requirements provide a powerful incentive for developers to avoid, minimize, and mitigate these wetland and floodplain impacts in order to maintain their flood storage and water filtration capacity. To benefit from these protections, wetlands and streams must continue to be recognized as “Waters of the United States” subject to Clean Water Act permitting requirements. Presently, these protective Clean Water Act safeguards are under attack and small streams, wetlands, and other waters now face serious danger of pollution and destruction, threatening not only these waters but also the larger rivers, lakes, and coastal waters into which they flow. Current efforts to drastically roll back the Clean Water Act must be stopped. Otherwise, low-lying communities across the country will be at increased risk of flooding and flood damage as millions more wetland acres are subject to unregulated dredging and filling.

#6 - Ensure Meaningful Public Input and Environmental Review

Rebuilding should rely on meaningful public input and environmental review to improve rebuilding plans and protect natural systems like wetlands and riparian habitat that are vital for community safety and fish and wildlife. Where rebuilding involves federal projects, permits, or funding, reviews under the National Environmental Policy Act (NEPA) helps ensure evaluation of the full suite of environmental impacts and public safety risks, leading to safer and healthier communities. Robust NEPA review is also critical to ensure transparent and science-based evaluation of major federal actions that could have downstream implications for community resilience in the face of future disasters.

The Administration recently finalized a rule to change the implementing regulations for NEPA, drastically undermining public input and the integrity of science-based decision-making, ignoring climate impacts and risks, and excluding more types of major federal actions from any kind of environmental review or public input. The Administration's changes to NEPA are unnecessary; special procedures already exist to allow federal agencies to quickly address emergency rebuilding needs. Instead, the changes to the implementing regulations will create more confusion and gridlock by upending decades of well-settled NEPA requirements and approaches. This attack on public input, sound decision-making, wise spending, and critical environmental and public health protections must be reversed.

#7 - Improve Stormwater Management

Stormwater management in urban and suburban areas is an increasingly daunting challenge as buildings and impervious surfaces lead to faster runoff and displace the floodwater storage capacity of natural systems. Additionally, increasing sea levels are undermining the ability of gravity-drained systems in coastal areas to carry and discharge municipal stormwater. As rebuilding begins, municipalities have an opportunity to better manage stormwater in ways that reduce future flood risk.

Natural drainage features, such as wetlands and grasslands, often prove to be the most efficient means of managing both the volume and velocity of water during extreme weather events. Where possible, these natural systems should be protected or restored, including by acquiring adjacent areas that can help contain flood flows and double as

open-space. Both new and rebuilt structures should incorporate pervious surfaces for walkways and parking areas where possible, and either include natural on-site runoff-containment measures or pay into regional containment approaches. Buildings, whether new or substantially rebuilt, should be constructed with floors higher off the ground, providing increased freeboard above curb-level to minimize damage when floods do occur.

Several EPA and Housing and Urban Development Grant programs – including the Clean Water State Revolving Fund and Community Development Block Grants– provide resources to communities to improve stormwater management, including through green or natural infrastructure solutions, and should be funded at greater levels and included in future recovery packages. Additionally, this funding should be targeted to establish a funding priority for infrastructure projects that utilize natural infrastructure.

#8 - Address Dangerous and Outdated Infrastructure

Dams and levees often degrade wildlife habitat and, when poorly maintained, put the public at risk during extreme weather events. Dam and levee failures cause untold suffering to communities and many billions of dollars in property damage. For instance, flooding from Hurricane Florence caused at least 10 dams to breach in the Carolinas, including a dam holding back a large reservoir at a Wilmington, North Carolina power plant that has likely sent coal ash from an adjacent dump into the nearby Cape Fear River. When Hurricane Matthew made landfall in 2016, twenty five dams failed in South Carolina and at least 17 dams failed in North Carolina. Another 51 dams in South Carolina failed during a major storm in 2015.⁹

Outdated dam and reservoir operating plans also harm wildlife habitat and put communities at risk particularly during major storms. The Corps of Engineers is responsible for operations at 707 dams that it owns across the country, and for flood control operations at 134 dams constructed or operated by other federal, non-federal or private agencies. Many of these dams are being operated under decades old plans that do not account for current conditions and do not use modern scientific tools, information, or state-of-the-art management approaches that can both ensure effective operation of federal projects *and* protect the environment. Many reservoirs are filling up with sediment and many dams and spillways are in need of major repairs.

Dams and levees that are no longer needed should be removed when possible, and

Congress and the Administration should ensure that federal dams and reservoirs are managed to protect communities and the environment.

#9 - Ensure Climate-Resilient Siting and Design of Toxic Pollutant Storage Facilities

It is not uncommon for energy companies to site toxic storage facilities - such as coal ash waste storage - near waterways. Coal ash contains toxic substances like arsenic, mercury, lead, and selenium, and a coal ash spill not only pollutes waterways with sludge but also with these toxins. The risks of coal ash toxic pollution are compounded where energy companies are permitted to leave most of the ash in primitive unlined pits filled with water. Florence flooding caused at least one spill at coal ash landfills in North Carolina, causing more than 2,000 cubic yards of toxic waste to be washed away, enough to fill more than 150 dump trucks.¹⁰ Federal and state water and toxic pollution laws must be more stringently enforced to require energy companies to take the necessary steps to properly site, design, and manage their coal ash and other toxic waste facilities to ensure that spills to waterways do not occur during storms, floods or hurricanes.

#10 - Ensure Climate-Resilient Siting, Design, and Management of Concentrated Animal Feeding Operations.

Severe hurricanes can push the limits of safety and sanitation for many agricultural operations. This was made particularly clear during Hurricane Florence. At the time of the hurricane, there were 62 industrial swine operations housing nearly a quarter million hogs, as well as 166 open pits storing swine feces and urine - all within the 100-year floodplain of North Carolina's rivers.¹¹ With the heavy rains and flooding from Florence, more than 50 hog lagoon failures were reported, with each releasing millions of gallons of untreated manure into surrounding waterways with significant human health and environmental impacts.¹²

These large concentrated animal feeding operations (CAFOs) require Clean Water Act permits where they discharge to "Waters of the United States." Most states have assumed this Clean Water Act permitting responsibility for CAFOs. The Environmental Protection Agency and state clean water permitting agencies must strengthen and strictly enforce CAFO permitting standards to properly site, design and manage CAFOs

to ensure that spills to waterways do not occur during storms, floods or hurricanes. In addition, states must do more to help relocate CAFOs currently located in particularly flood-prone areas.

#11 - Increase Funding for Farm Bill Conservation Programs

Farm bill conservation dollars help farmers adopt practices that increase their resilience to severe weather such as flooding and wind. In addition, USDA uses Farm Bill conservation funding to help farmers and ranchers deal with cleanup in affected counties through special signups to the Environmental Quality Incentives Program. This funding helps farmers and ranchers deal with livestock mortality and carcass disposal as they work to recover their agricultural property from damaging storms. However, Farm Bill conservation programs such as The Environmental Quality Incentives Program are routinely oversubscribed. That is why it is critical that the next Farm Bill increase funding for conservation programs and that the programs are not cut through the yearly appropriations process.

#12 - Advance Climate and Clean Energy Solutions

While hurricanes have always been a reality in the Atlantic and Gulf of Mexico, climate change is increasing the severity and intensity of those that occur and making them much more destructive and dangerous. This is because of several interrelated factors: sea-level rise means storm surge reaches farther inland; warmer ocean and air temperatures translate to more moisture in the air, resulting in more rain during hurricanes; and warmer waters provide more of the energy that powers hurricanes and allows them to strengthen in intensity.

According to a 2018 survey of mayors by the Center for Climate and Energy Solutions, “Ninety- five percent of responding cities report they have experienced climate impacts in the last five years—from flooding, heavier snow and ice storms, wildfires, heat waves and drought, and 57 percent of cities responding are planning for new climate actions in the coming year.”¹³ Aware of the local dangers of unabated climate change, cities and states are leading the way to cut climate-altering pollution, including through carbon pricing, emissions caps, energy efficiency requirements and promotion of low-carbon transportation.

However, more action is still required at the state, national, and international levels to sufficiently and quickly drive down greenhouse gas emissions to safeguard people and wildlife from the most extreme impacts. Key actions should include:

- Harness market forces to swiftly draw down greenhouse gas emissions, including through a smart, comprehensive federal carbon pricing program that protects frontline communities;
- Protect forests, wetlands, and grasslands, and adopt land management practices that allow these systems to naturally sequester carbon from greenhouse gas emissions, and provide community protections from extreme storms;
- Target climate adaptation and resilience funding to frontline and underserved communities that are most vulnerable to climate-related threats such as hurricanes.
- Invest robustly in climate science and monitoring, renewable energy research and development, energy storage, vehicle electrification, and clean public transportation programs;
- In the absence of a price on carbon, continue to support renewable energy tax credits that help level the playing field with subsidized fossil fuels, and improve transmission policies to ready the nation's power grid to accommodate more renewable sources; and
- Ensure the country continues to develop its vast offshore wind resource by supporting federal permitting processes that are efficient, environmentally responsible, and wildlife conscious.

Additional Resources

For more information from the National Wildlife Federation on the above policy priorities, please visit:

- [The Protective Value of Nature: A Review of the Effectiveness of Natural Infrastructure for Hazard Risk Reduction](#)
- [Natural Climate Solutions Policy Platform](#)
- [Natural Defenses in Action: Harnessing Nature to Protect Our Communities](#)
- [Natural Defenses from Hurricanes and Floods: Protecting America's Communities and Ecosystems in an Era of Extreme Weather](#)
- [Green Works for Climate Resilience: A Guide to Community Planning for Climate Change](#)

Other National Wildlife Federation reports and resources can be found at:

- <https://www.nwf.org/Our-Work/Environmental-Threats/Climate-Change/Climate-Smart-Conservation/Adaptation-Report>

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1. <https://www.nhc.noaa.gov/archive/2020/>
 2. <https://www.cpc.ncep.noaa.gov/products/outlooks/hurricane.shtml#:~:text=The%202020%20Atlantic%20hurricane%20season%20is%20now%20predicted%20to%20produce,expected%20to%20become%20major%20hurricanes>
 3. Narayan, S., Beck, M.B., Wilson, P., et al., The Value of Coastal Wetlands for Flood Damage Reduction in the Northeastern USA. Scientific Reports 7, Article number 9463 (2017), doi:10.1038/s41598-017-09269-z (available at <https://www.nature.com/articles/s41598-017-09269-z>).
 4. EPA, Wetlands: Protecting Life and Property from Flooding, May 2006 at <https://www.epa.gov/sites/production/files/2016-02/documents/flooding.pdf>
 5. <http://iopscience.iop.org/article/10.1088/1748-9326/aaac65/pdf>
 6. <https://www.apnews.com/ec380b921573424fa3fda92514c416e1/Florence-likely-to-expose-gaps-in-flood-insurance>
 7. <https://www.nibs.org/news/381874/National-Institute-of-Building-Sciences-Issues-New-Report-on-the-Value-of-Mitigation.htm>
 8. The noted provisions are contained within the bill reauthorizing the Federal Aviation Administration, and were originally introduced as the Disaster Recovery Reform Act (HR 4460). See: https://transportation.house.gov/uploadedfiles/drra_packet_2018.pdf
 9. <https://www.eenews.net/greenwire/2018/09/19/stories/1060098359>
<https://www.nbcchicago.com/news/national-international/hurricane-flooding-dam-evacuees-carolinas/2039879/>
 10. https://www.washingtonpost.com/energy-environment/2018/09/21/dam-breach-reported-former-nc-coal-plant-raising-fears-that-toxic-coal-ash-may-pollute-cape-fear-river/?utm_term=.4dc4c498191f
 11. <https://www.ewg.org/research/exposing-fields-filth#.W6felOhKhPY>
 12. <https://www.npr.org/2018/09/22/650698240/hurricane-s-aftermath-floods-hog-lagoons-in-north-carolina>
 13. Center for Climate and Energy Solutions. Mayors Leading the Way on Climate--2018. <https://www.c2es.org/document/mayors-leading-the-way-on-climate-2018/>