

Less Shelter from the Storm

Environment Minnesota's Analysis of How Federal Budget Proposals put Minnesota at Risk 10/20/2017

With recent massive hurricanes pummeling our coasts, we need to do more to protect our communities. We need to make them less susceptible to flooding, sewage overflows and leaks from toxic waste sites, and, of course, we need to prevent even more intense global warming fueled extreme weather in the future. Unfortunately, as detailed below, pending budget proposals from the Trump administration and Congress threaten key programs that protect our communities. Rather than protecting our most vulnerable communities, budget proposals on the table in Washington, D.C. right now would threaten coastal resiliency, remove protections for flood-absorbing wetlands, neglect funding for stormwater and sewage treatment, and expose more Americans to toxic chemicals. While we do everything in our power to cut the pollution that will fuel even more extreme weather in the future, we need a budget that supports programs that can shelter us from the coming storms.

Environment Minnesota analyzed the FY 2018 budget proposed by President Trump in the spring of 2017 and the current House and Senate appropriations bills and their impact on programs that protect communities from storm-related impacts. Overall, the Trump administration proposes a 31% (\$2.6 billion) budget decrease for the Environmental Protection Agency (EPA) -- the primary agency for protecting the air we breathe and the water we drink, and reducing our exposure to toxic chemicals. The administration's proposal also specifically proposed eliminating or cutting important clean water, coastal protection and slashing toxic waste cleanup programs. To date, the House has also proposed steep but slightly smaller cuts to the EPA of \$528 million. The House spending bills also include several harmful legislative "riders," including one that targets the Clean Water Rule, which protects flood-absorbing wetlands. The House bill also cuts important coastal protection programs and initially slashed clean water grants to states. Environment Minnesota is calling on Senators X and Y to protect Minnesotans by fully funding important programs that protect our communities and opposing these and any other harmful proposals.

Protect Flood-Absorbing Wetlands

Floods are the most common natural disaster in the US, and scientists predict that the damage caused by floods will only increase in the years to come, to over \$1 trillion per year by 2050 globally¹. As climate change continues to progress, extreme rain events that trigger flooding are likely to become increasingly frequent. In a warming world where extreme precipitation events will be more common, we need to protect critical natural flood barriers so that communities are safer from flooding and extreme precipitation events.

¹ Stephane Hallegatte et al, "Future Flood Losses in Major Coastal Cities," Nature Climate Change, doi: 10/1038/NCLIMATE1979, 18 August 2013.

Wetlands are Nature's Flood Control, but the House Budget Threatens their Protection

During times of heavy precipitation, wetlands act like a sponge to slow the velocity of runoff and retain excess water. In fact, an acre of wetland 1 foot deep can hold 330,000 gallons of water. In this way, wetlands reduce the danger of flooding and mitigate its worst impacts, providing water flow regulation services to communities across the US.

According to data from the National Wetlands Inventory, there are approximately 10.1 million acres of freshwater wetlands in Minnesota. In the counties for which there are flood hazard data available from FEMA, approximately 270,000 acres of the state's freshwater wetlands are in 100-year-flood zones. In Ramsey County, home to St. Paul and one of 35 counties that experienced a state of emergency during severe flooding in June 2014, there are approximately 9,000 acres of freshwater wetlands, of which approximately 5,000 acres are located in 100-year-flood zones. Together, these wetlands are capable of holding more than 2.8 billion gallons of water.

Flooding affected vast stretches of Minnesota during the month of June 2014. The Mississippi River, the Crow River and the St. Croix River overflowed as excessive rain and unusually large amounts of melting snow exceeded river capacity. June 2014 was the wettest month on record for Minnesota. This severe flooding caused a state of emergency in 35 counties. Soybean and corn crops were negatively affected, and flooding in St. Paul caused road closures. In Delano, businesses near the overflowing Crow River were evacuated. At Blue Mounds State Park, near Luverne, floodwaters from Blue Mounds Creek caused a dam to wash out and drain Lower Mound Lake. The Minnesota National Guard was deployed to the town of Henderson, which was isolated by mudslides and flooded roads. This is not an isolated incident for the state. A study by the Minnesota Department of Health revealed that significant numbers of Minnesotans are highly vulnerable to flash floods. Extreme rain events are a primary cause of such flooding, and these large rain storms are occurring at a higher frequency than had previously been recorded. Scientists predict that global warming will make heavy rainfall events even more frequent. Preserving the state's wetlands will be a key part of Minnesota's preparedness for such events in the future by maintaining the landscape's ability to absorb excess rainfall.

Wetlands protect our communities from flooding, so paving over or otherwise destroying wetlands reduces the ability of a landscape to absorb rainfall from extreme precipitation events.

Wetlands are important natural flood protections, and millions of acres of wetlands are protected by the Clean Water Rule, which restored full protections to thousands of wetlands and streams across the country. However, the Trump administration and some in Congress want to repeal the Clean Water Rule, which, in addition to protecting critical wetlands, protects the drinking water of one in three Americans, including 979,000 Minnesotans. Now, the House budget bill has provisions that would cut the public out of the repeal process, making it easier for President Trump to dismantle this important protection.

We should be doing everything we can to protect our wetlands, nature's best defense against flooding, but the current administration and the House budget bill would derail clean water protections and leave critical wetland ecosystems more vulnerable to pollution and degradation. We shouldn't be reducing the number of wetlands protected by our nation's bedrock environmental laws. Instead, we need to protect wetlands and protect our communities from flooding and extreme weather.

Make Our Coasts More Resilient

As the climate changes, our coastal communities will face more extreme weather events and increased dangers due to sea level rise. We need to help communities adapt to these coming changes by funding resiliency programs and making sure we have the best information on weather patterns and possible threats.

Coastal Resiliency is Key

With recent mega-storms showing the importance of protecting and creating more resilient coastlines, it's disappointing to see budget proposals from the Trump administration and Congress that threaten coastal communities.

As our climate changes, our coastal communities will need to adapt to more intense storms and changing ecosystems, and state governments need to help coordinate their response. That's why Coastal Zone Management Grants are so important--they provide a vital source of funding for states who are working with coastal communities to protect our coasts and beaches. The Trump budget would eliminate this funding, reducing the money states have to respond to the needs of coastal communities.

In Minnesota, NOAA recommended \$0.98 mil in Coastal Zone Management Grants to support Minnesota's coastal management in 2017. The Trump Budget planned on eliminating this program, and it would see cuts under the House's budget as well--they propose to cut the Coastal Zone Management grants program from \$70 million to \$45 million--a 35% cut.

Regional Coastal Resilience Grants provide our coastal communities with the funding they need to tackle the threat of climate change. These grants go to communities and regions that have identified gaps in their defense against storms and rising oceans, and are working together with state agencies and private organizations to address hazards and problems on their coasts. By providing funding for these grants, the Federal government is empowering local decision-makers and unlocking additional resources to protect coastal communities.

Both the Trump administration and the House propose eliminating these grants entirely, harming the ability of Minnesota's coastal communities to prepare themselves for future storms.

Research to help us prepare

As weather patterns and sea levels change, it will be more important than ever to have our best minds working to understand and document new changes, so policy makers and local communities can get the information they need to protect themselves.

That's why it's so troubling that the Trump budget proposes a \$139 million cut to NOAA's Office of Oceanic and Atmospheric Research. This office is responsible for financing cutting edge research into our changing climate through its competitively funded climate research, which works with universities, labs, and institutes to better understand our climate. Trump would cut this program by \$31 million. The office also oversees NOAA's weather and air chemistry research, leaving us less prepared to predict the weather and the aftereffects of air pollution. ²

Under the Trump budget, the federal Sea Grant program, which provides support to oceanic research institutes and ocean departments at partner universities that work to better understand our oceans and better manage our coastal resources, would be eliminated. This would halt the critical research into coastal resilience and our changing oceans conducted by these universities and institutes that will make sure we have the best tools to protect our communities from the changing climate.

In Minnesota alone, \$1,980,000 will be cut, cutting off funds to institutes researching how our coasts can best adapt to changing oceans and climates.

Improve and Repair our Wastewater and Sewage Infrastructure

The Budget Proposals Mean More Sewage Overflows and Runoff Pollution

The Clean Water State Revolving Fund helps prevent sewage overflows and runoff pollution, both of which are exacerbated by heavy storms and rains. Adequate wastewater infrastructure plays a vital role in the health of streams, rivers, and lakes, where discharged wastewater and stormwater often end up. Wastewater infrastructure must also become more resilient to the impacts of climate change, including sea level rise, stronger and more frequent storms, flooding, and drought.

In the aftermath of Harvey, we are already seeing reports of sewage contamination in the water flooding citizen's homes. People are getting sick, and it's because our wastewater and sewage infrastructure wasn't ready³.

The Clean Water State Revolving Fund helps improve infrastructure resilience against extreme weather events. Since its inception in 1987, the Clean Water State Revolving Fund has provided more than \$111 billion in low-interest loans and subsidies. In 2016, Minnesota received \$24.6 million through this program to repair and upgrade wastewater systems, manage contaminated urban runoff, and upgrade treatment facilities. The program provides affordable financing to thousands of communities to upgrade and repair wastewater treatment plants,

² http://www.corporateservices.noaa.gov/nbo/fy18_bluebook/FY18-BlueBook.pdf

³ https://www.nytimes.com/2017/09/11/health/houston-flood-contamination.html?_r=1

correct combined and sanitary sewer overflows, and protect waterbodies from nonpoint sources of pollution at a much lower cost than possible through conventional financing.

Unfortunately, this program is not adequate to the task. We are already facing a maintenance backlog in our wastewater systems, and this problem will only become more pressing. An EPA survey⁴ estimated that \$271 billion is needed over the next 20 years to maintain and improve the nation's wastewater infrastructure, including pipes that carry wastewater to treatment plants, the technology that treats the water, and methods for managing stormwater runoff. Most of that \$271 billion investment is needed for projects in the next 5 years.

However, despite the desperate need across the country for these critical repairs and upgrades, the Trump administration keeps the program funded at current inadequate levels and the initial House budget actually proposed cutting funding for the Clean Water State Revolving Fund by \$250 million. This cut was later reversed by an amendment on the House floor.

Instead of shortchanging a program that helps states and communities protect their waterways and become more resilient to the impacts of climate change, we should have a budget that protects and expands the Clean Water State Revolving Fund, providing funds for communities to build up their resilience.

Keep Us Safe from Toxic Wastes

The Superfund program was established in the 1980's by the EPA in the aftermath of several environmental crises such as the Love Canal disaster in New York that forced hundreds of people to relocate from exposure to dangerous chemical pollution. The Superfund program is currently tasked with cleaning up more than 1,300 of the most toxic wastes sites⁵ in the country and responding to environmental catastrophes and natural disasters.

One in four Americans, including over 10 million children, live within 3 miles of a Superfund site⁶. In Minnesota, there are 46 Superfund sites that are registered on the National Priority List and warrant further investigation and long-term cleanup (see table 5). Since the program was founded, over 394 sites have been cleaned up and delisted⁷.

The Superfund program facilitates natural disaster response in two ways: First, the Superfund program provides training for thousands of first responders (firefighters, police, emergency room nurses, etc.) so they can protect the public and themselves by detecting and identifying hazardous substances. This training is an essential element of emergency and disaster response capabilities. Second, the Superfund program provides the expertise and financial

⁴ <https://www.epa.gov/newsreleases/epa-survey-shows-271-billion-needed-nations-wastewater-infrastructure>

⁵ <https://www.epa.gov/superfund/national-priorities-list-npl-sites-state>

⁶ <http://www.uspirg.org/reports/usp/empty-pockets>

⁷ <https://www.epa.gov/superfund/deleted-national-priorities-list-npl-sites-state>

resources to conduct emergency and long-term response actions that protect the public from hazardous substances.

A 2012 EPA assessment found that more than 500 Superfund sites were located in flood zones, 50 of which were based in coastal areas susceptible to sea level rise⁸. In the last month, Hurricane Harvey flooded 13 Superfund sites⁹ and left citizens in Houston wading through toxic water. With climate change expected to intensify storms like Hurricane Harvey in the future, reinforcing the Superfund program will become more critical than ever to keep our communities safe from harmful toxins.

Unfortunately, The Trump administration has proposed to cut the Superfund program by \$330 million, nearly 30% of its previous budget.¹⁰ However, the House has proposed to increase the level of funding for the Superfund program as a whole by \$27.6 million.

Now, more than ever, is it essential that we fully fund toxic waste cleanups, not slash their budgets. Reduced funding levels for the Superfund program has already prompted the EPA to delay approximately one-third of new projects that were scheduled.¹¹ These drastic funding cuts would further backlog the cleanup of these sites, posing a significant risk to to our families.

⁸ <https://www.nytimes.com/aponline/2017/09/09/us/ap-us-hurricane-irma-toxic-sites.html>

⁹ <https://www.epa.gov/newsreleases/status-superfund-sites-areas-affected-harvey>

¹⁰ <https://www.govinfo.gov/content/pkg/BUDGET-2018-MSV/pdf/BUDGET-2018-MSV.pdf>

¹¹ <https://www.gao.gov/products/GAO-15-812>

Appendix A: Data Tables

Table 1: Wetland Acreage for Select States

State	Acres of freshwater wetlands in STATE	Acres of freshwater wetlands in 100-year flood zones for which flood hazard data are available from FEMA
Colorado	1 million	75,000
Florida	9.8 million	6.9 million
Maryland	425,000	106,000
Massachusetts	444,000	148,000
Minnesota	10.1 million	270,000
New Jersey	687,000	125,500
New York	2 million	183,000
Pennsylvania	377,000	164,000
Virginia	1 million	529,000
Wisconsin	5.4 million	1.4 million
Source	http://www.environmentamerica.org/sites/environment/files/reports/ShelterfromtheStorm_EnvAmerica_Final.pdf	

Table 2: Clean Water Rule Data

State	State population whose drinking water is protected by the Clean Water Rule	Miles of streams protected by Clean Water Rule in State	Percent of streams protected by Clean Water Rule in State
Maine	454,000	25,000	55%
Massachusetts	4.9 million	4,300	52%

New York	11.1 million	28,000	55%
Virginia	2.4 million	28,000	57%
Ohio	5.3 million	51,000	60%
Michigan	1.4 million	24,000	48%
Colorado	3.7 million	73,000	68%
Montana	234,000	109,000	63%
Maryland	4 million	10,000	59%
Pennsylvania	8 million	50,000	59%
Florida	1.8 million	15,000	29%
New Jersey	4.3 million	4,000	48%
North Carolina	4.7 million	136,000	56%
Minnesota	979,000	47,000	51%
Oregon	1.8 million	61,000	53%
Washington	2 million	38,000	54%
Data Source:	https://19january2017snapshot.epa.gov/sites/production/files/2015-04/documents/wetlands_science_surface_drinking_water_surface_drinking_water_results_county.pdf		

Table 3: Coastal Zone Management Grants & Sea Grants

State	Coastal Zone Management Grants, NOAA FY 2017 funding guidance	Sea Grants: funding research on Oceans at Universities and Institutes in 33 States (*Base funding, FY 2014--)
Colorado	n/a	n/a
Florida	\$2.68 mil	\$2,256,975
Maine	\$2.56 mil	\$1,004,221
Maryland	\$2.62 mil	\$1,372,903
Massachusetts	\$2.48 mil	**\$1,951,000; \$1,000,000
Michigan	\$2.62 mil	\$1,361,700
Minnesota	\$0.98 mil	\$1,000,000
Montana	n/a	n/a
New Jersey	\$2.61 mil	\$1,274,449
New York	\$2.68 mil	\$2,531,676

North Carolina	\$2.54 mil	\$1,509,000
Ohio	\$1.83 mil	\$1,111,432
Oregon	\$1.69 mil	\$2,157,000
Pennsylvania	\$1.80 mil	\$1,000,000
Virginia	\$2.67 mil	\$1,446,574
Washington	\$2.59 mil	\$2,470,000
Wisconsin	\$2.29 mil	\$1,789,000
		* includes Coastal Community Development funds
		**Funds distributed between MIT and Woods Hole Oceanographic Institute
Source	State numbers: https://coast.noaa.gov/czm/media/fy17-funding-guidance.pdf ; elimination of funding: https://www.nrdc.org/experts/alison-chase/trump-budget-slashes-coastal-and-ocean-funding ; House cuts: https://www.nrdc.org/experts/alison-chase/next-steps-our-ocean-budget	State numbers: http://seagrant.noaa.gov/Portals/0/Documents/who_we_are/legislation/SeaGrantAllocationPolicyFY2014andBeyond_9_23_14.pdf ; elimination of funding by Trump budget: https://www.nrdc.org/experts/alison-chase/trump-budget-slashes-coastal-and-ocean-funding ; restoration of funding: p. 18, https://appropriations.house.gov/uploadedfiles/cjs.report.07.13.17.pdf

Table 4: Clean Water State Revolving Fund Grants

State	Clean Water State Revolving Fund Grant Money for STATE, 2016 ¹²
Colorado	\$10.7 million
Florida	\$45.1 million
Maine	\$10.3 million

¹² https://www.epa.gov/sites/production/files/2016-12/documents/2016_cwsrf_final_allotments.pdf

Maryland	\$32.3 million
Massachusetts	\$45.4 million
Michigan	\$57.4 million
Minnesota	\$24.6 million
Montana	\$6.5 million
New Jersey	\$54.6 million
New York	\$147.5 million
North Carolina	\$24.1 million
Ohio	\$75.2 million
Oregon	\$15.1 million
Pennsylvania	\$53 million
Virginia	\$27.3 million
Washington	\$23.2 million
Wisconsin	\$36.1 million

Table 5: National Priority List Superfund Sites

State	Hazardous waste sites in STATE on the EPA's national priority list for the Superfund program ¹³
Colorado	23
Florida	94
Maine	16
Maryland	25
Massachusetts	40
Michigan	88
Minnesota	46
Montana	18

¹³ <https://www.epa.gov/superfund/search-superfund-sites-where-you-live#npl>

New Jersey	150
New York	119
North Carolina	48
Ohio	53
Oregon	19
Pennsylvania	127
Virginia	35
Washington	69
Wisconsin	55

Appendix B: Regional Coastal Resilience Grants

The Federal government empowers state and local decision-makers to tackle problems and threats they've identified for their own communities by providing federal funding. This funding, which is matched by state and private funds, helps state and local coalitions take preventative steps that will improve their coastal communities' ability to deal with things like sea level rise and coastal storms.

Project Descriptions, 2017:

These are projects in our target states that are on the calendar for 2017-- NOAA has recommended the funds for them, though those funds may not yet have been fully dispersed.

Maine/Massachusetts-

Reducing Flood Risk in New England with Nature-Based Infrastructure

Applicant: The Nature Conservancy

Recommended Federal Funding: \$999,999

Match: \$500,000

This regional effort to reduce flood risk in New England is focused on *increasing the effective use of nature-based infrastructure for flood protection*. The project team will develop region-specific information on suitable natural infrastructure types and benefits and will work with several communities to implement and monitor a range of nature-based coastal infrastructure projects. The experience gained here will benefit communities across the region and help to advance local, state, and national policies to promote effective use of the approach to reducing flood risk. The Nature Conservancy, in partnership with a consortium of state coastal zone management programs, is leading the project.

Project Partners: Maine Coastal Management Program, New Hampshire Department of Environmental Services Coastal Program, Massachusetts Office of Coastal Zone Management, Rhode Island Coastal Resource Management Council, University of Connecticut, Northeast Regional Ocean Council

Massachusetts

Jones River-Elm Street Dam Removal at Head of Tide

Applicant: Jones River Watershed Association

Recommended Federal Funding: \$553,270

Match: \$301,847

The Jones River Watershed Association, working with the Massachusetts Division of Ecological Restoration, Town of Kingston, NOAA, and other partners, ***will remove an undersized concrete dam and spillway that has limited capacity during flood events. This deficiency creates risks to surrounding property and damage to surrounding habitats.*** Removal of the dam will eliminate safety risks, liability, and maintenance costs associated with the dam, improve water quality, and increase spawning access to four miles of mainstem habitat and five miles of tributary for species such as shad and river herring.

Project Partners: Massachusetts Division of Ecological Restoration, Division of Marine Fisheries, Division of Fisheries and Wildlife, Town of Kingston

Virginia--

Reducing Impacts of Storm Flooding through Natural and Nature-based Infrastructure in Virginia

Applicant: Virginia Institute of Marine Science

Recommended Federal Funding: \$834,991

Match: \$418,640

This effort is focused on addressing flooding issues across coastal Virginia through use of nature-based infrastructure. ***This includes developing informative tools that allow local planners in 37 coastal counties to determine suitable areas to implement natural infrastructure.*** Guidance for use in Virginia's coastal habitats and other outcomes of this effort will assist local communities in implementing successful natural infrastructure plans and understanding the many co-benefits, ***including water quality improvements and flood risk reduction.*** The Virginia Institute of Marine Science, working with project partners that include the Virginia Coastal Policy Center, Wetlands Watch, and many state agencies, is leading this effort.

Project Partners: Virginia Coastal Policy Center, Wetlands Watch, Albemarle-Pamlico National Estuary Partnership

Florida--

Oyster Reef Restoration in Naples Bay, Florida

Applicant: City of Naples

Recommended Federal Funding: \$484,244

Match: \$302,336

The City of Naples, working in partnership with the Florida Department of Environmental Protection and NOAA, will restore five acres of oyster reef in three locations in Naples Bay where oysters have experienced an 80 percent decline. Reef-ball and shell-bag pod reefs will naturally protect more than 1,000 feet of mangrove shoreline from storm surge and help restore mangrove and seagrass habitat. This habitat restoration effort will also improve water quality and increase the local community's awareness of the benefits of living shorelines.

Project Partners: Florida Department of Environmental Protection, Big Cypress Basin of the South Florida Water Management District

Overcoming Barriers to Flood Resilience in Northern Gulf of Mexico Coastal Communities

Applicant: Marine Environmental Sciences Consortium, Dauphin Island Sea Lab

Recommended Federal Funding: \$496,285

Match: \$250,689

Through a series of short films, small-grant funding, and technical assistance, this project will enhance the region's ability to address coastal flooding impacts and recovery in Mississippi, Alabama, and Northwest Florida. The project will raise awareness of challenges and issues that communities are facing in preparing for extreme weather and climate-related hazards and assist with the implementation of solutions that save lives and protect the economy. The Dauphin Island Sea Lab, led by the Northern Gulf of Mexico Sentinel Site Cooperative, will guide a team of federal, regional, state, and local project partners charged with this task.

Project Partners: Dauphin Island Sea Lab, Northern Gulf of Mexico Sentinel Site Cooperative, NOAA Office for Coastal Management and National Centers for Coastal Ocean Science, Mississippi-Alabama Sea Grant Consortium, University of Florida Institute of Food and Agricultural Sciences Extension, Mississippi Department of Marine Resources, Gulf of Mexico Climate Community of Practice, Louisiana Sea Grant, Escambia County, Florida

A Coastal Hazards Training Program for Local Government Officials along the Gulf Coast

Applicant: National Association of Counties Research Foundation

Recommended Federal Funding: \$650,000

Match: \$335,024

The goal for this project is to help communities better prepare for, recover from, and adapt to extreme weather and climate-related events. Included in the effort is a web-based professional education program for local government officials that includes best practices for communicating risk-related information and strategies for addressing coastal challenges. The program will include local workshops and technical assistance that supports team-based approaches for implementing hazard

mitigation strategies at the regional level. This program will result in more resilient coastal economies and effective stewardship of natural resources along the Gulf Coast. The National Association of Counties Research Foundation, in partnership with the Association of State Floodplain Managers and Coastal States Organization, is leading this project.

Project Partners: Association of State Floodplain Managers, and Coastal States Organization

Oregon

Preparing the Oregon Coast for a Catastrophic Tsunami

Applicant: Oregon Department of Land Conservation and Development

Recommended Federal Funding: \$285,000

Match: \$142,500

For this project, new tsunami evacuation maps, improved evacuation procedures, and innovative land use strategies will be created for Port Orford, Newport, Lincoln City, Rockaway Beach, and Gearhart, Oregon. Local leaders and citizens will work together to investigate community vulnerabilities and identify land use ***strategies that provide the greatest potential to lessen the loss of life and property from a catastrophic tsunami***. The Department of Land Conservation and Development, in partnership with the Oregon Department of Geology and Mineral Industries, will lead this effort.

Project Partners: Oregon Department of Geology and Mineral Industries, Port Orford, Newport, Lincoln City, Rockaway Beach, and Gearhart, Oregon

Winter Lake Restoration Project

Applicant: Beaver Slough Drainage District

Recommended Federal Funding: \$750,000

Match: \$375,000

The Beaver Slough Drainage District, NOAA, and its partners will restore 407 acres of tidal wetlands, provide overwinter habitat for juvenile coho salmon, and re-establish fish access to 1,300 acres within the Coquille River estuary of southwestern Oregon. The project will create high-quality habitat by restoring more than seven miles of tidal channels, removing drainage canals and interior dikes, replacing undersized culverts with bridges to improve fish passage, and planting more than 200 acres with wetland plants. This project will address a key limiting factor for Endangered Species Act-listed coho salmon populations by providing an off-channel, slow-moving water refuge for juvenile

coho and will add approximately 122,000 smolts annually to the Coquille River. This project also establishes new stakeholder partnerships with agricultural and recreational hunting communities.

Project Partners: Beaver Slough Drainage District, The Nature Conservancy, U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife, China Creek Gun Club, Coquille Indian Tribe, Oregon Watershed Enhancement Board, U.S. Department of Agriculture Natural Resources Conservation Service

Washington

Restoring Resiliency in Puget Sound Stillaguamish River Delta

Applicant: Washington Department of Fish and Wildlife

Recommended Federal Funding: \$1,446,985

Match: \$1,000,000

Washington Department of Fish and Wildlife will work with NOAA and other local partners to restore 337 acres of wetlands in the Stillaguamish River delta of Puget Sound, Washington. As a gateway to the Stillaguamish River basin spawning and rearing areas, the restored estuarine habitat will provide valuable foraging opportunities and refuge habitat for migratory species, including Endangered Species Act-listed Puget Sound Chinook. ***This restoration project will breach existing dikes, build a setback dike, re-establish and enhance off-channel habitat, and reestablish tidal flow into the area. Not only will a new setback dike provide protection to critical infrastructure and private property, but the restored habitat will also provide natural flood protection because it can absorb and store large amounts of rainwater or water runoff during a storm, in addition to providing a buffer for tidal influence during periods of high water.***

Project Partners: Stillaguamish Tribe, Skagit River Systems Cooperative, The Nature Conservancy

Kilisut Harbor Channel Restoration

Applicant: North Olympic Salmon Coalition

Recommended Federal Funding: \$548,000

Match: \$274,000

The North Olympic Salmon Coalition, in collaboration with NOAA and the Port Gamble S’Klallam Tribe, will replace an earthen causeway and culverts with a bridge that will allow for tidal flow between southern Kilisut Harbor and Oak Bay. The project will restore 27 acres of tidal wetlands and improve water quality in Kilisut Harbor. Water quality improvements are expected to lower water temperature and reduce the potential for low dissolved-oxygen levels. This will help shellfish and

Endangered Species Act-listed Puget Sound Chinook and Hood Canal summer chum. ***Upgrading the only road access to an island community by raising the road and embedded utilities will improve the community's resilience by reducing its vulnerability to flooding.***

Project Partners: Port Gamble S'Klallam Tribe, U.S. Navy, Washington Department of Transportation, Washington Department of Natural Resources

Wisconsin

Improving Economic Security in Coastal Wisconsin

Applicant: Wisconsin Department of Administration

Recommended Federal Funding: \$840,000

Match: \$420,518

Southeastern Wisconsin wants to reduce damages caused by coastal hazards, such as erosion, coastal storms, and fluctuating water levels. For this project, guidance will be developed with regard to options for protecting bluff, beach, and harbor ecosystems and the coastal economy. Exploring future possibilities through scenario development and improving risk communication are also parts of the effort. The Wisconsin Department of Administration's Wisconsin Coastal Management Program is leading this project, and participation involves four coastal counties, 22 coastal municipalities, and various state and local organizations.

Project Partners: University of Wisconsin Sea Grant Institute, University of Wisconsin-Madison Department of Civil and Environmental Engineering, Southeastern Wisconsin Regional Planning Commission

Project descriptions, 2015-2016

These projects in our target states were recommended by NOAA to receive grant funding in 2015-2016.

Massachusetts

Resilient Cape Cod: A Path Forward with Innovative Tool Development and Public Engagement

Applicant: Cape Cod Commission

Recommended Federal Funding: \$522,348 (FY 2015)

Match: \$258,927

The Cape Cod Commission and partners will undertake a public planning process to improve community understanding of climate change impacts, sea level rise scenarios, and various adaptation strategies. The planning process will include economic research, a public engagement process, and the development of communication tools to help residents and decision makers understand the environmental and socio-economic costs and benefits of different adaptation strategies. This information will be used to inform an adaptation plan for the Town of Barnstable, Massachusetts, to implement new policies and serve as a model for other Cape Cod towns.

Project Partners: The Association to Preserve Cape Cod, Waquoit Bay National Estuarine Research Reserve, Town of Barnstable and Barnstable County, Massachusetts

High Resolution Coastal Inundation Modeling and Advancement of Green Infrastructure and Living Shoreline Approaches in the Northeast

Applicant: Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS)

Recommended Federal Funding: \$891,243 (FY 2016)

Match: \$456,257

Each year in the Northeast U.S., coastal storms cause considerable economic disruptions as a result of damages to property, infrastructure, and natural resources. The Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS) will work to lessen these impacts. ***This project will document and predict coastal storm impacts and increase the implementation of sustainable, nature-based infrastructure approaches (living shorelines).*** The project will also fill high-priority data and capacity gaps, develop tools for decision-making, and improve communications and outreach.

Project Partners: Researchers from each of the coastal New England states, including University of Maine, University of New Hampshire, University of Massachusetts at Dartmouth, University of Rhode Island, and University of Connecticut's Connecticut Institute for Resilience and Climate Adaptation. State coastal program members of the Northeast Regional Ocean Council (NROC), including Maine Coastal Program, New Hampshire Department of Environmental Services, Massachusetts Office of Coastal Zone Management, and Rhode Island Coastal Resources Management Council. Other partners, including The Nature Conservancy, Gulf of Maine Research Institute, RPS Applied Science Associates, Spaulding Environmental Associates, and NROC.

Virginia

Project ARRK: Adaptation and Regional Resiliency Kit

Applicant: City of Virginia Beach

Recommended Federal Funding: \$844,487 (FY 2016)

Match: \$899,440

The City of Virginia Beach, located in the southeastern, or Tidewater, area of Virginia, has one of the highest rates of sea level rise on the Atlantic coast. It sits at the heart of the Hampton Roads region, home to 1.7 million people and a significant maritime industry, including the largest naval facility in the world. This project will prioritize and implement adaptation strategies such as the relocation or construction of infrastructure to address sea level rise impacts on land use and development. Because of the city's influence in the region, and the public engagement process included in this grants award project, this effort will benefit the greater Hampton Roads region.

Project Partners: City of Virginia Beach, Georgetown Climate Center, Hampton Roads Planning District Commission, Old Dominion University-Virginia Sea Grant, and Dewberry.

Virginia, New Jersey, New York, Maryland, Delaware

Mid-Atlantic Regional Resilience: Linking Coastal Ocean Information to Enhance Economic, Social and Ecological Resilience

Applicant: Coastal States Stewardship Foundation on behalf of the Mid-Atlantic Regional Council on the Ocean

Recommended Federal Funding: \$514,507 (FY 2016)

Match: \$257,253

The ocean plays a critical role in community resilience and is a fundamental source of economic and ecological value and productivity in the Mid-Atlantic, yet coastal communities are largely unaware of this critical role and how changing ocean conditions can impact the economy, society, and the environment. The Mid-Atlantic Regional Council on the Ocean (MARCO) will leverage its partnerships to increase coastal community resilience by enhancing the public's understanding of the science behind changing ocean conditions and what this means in terms of ocean resources and coastal economies. Coastal and ocean stakeholders throughout the Mid-Atlantic region will also benefit from improved understanding of the relationships between changing ocean conditions and coastal economies, and community resilience.

Project Partners: Mid-Atlantic Regional Council on the Ocean – MARCO (Virginia, Maryland, Delaware, New Jersey, New York), Mid-Atlantic Ocean Data Portal (principal: Monmouth University)

Urban Coast Institute), and Mid-Atlantic Regional Association Coastal Ocean Observing System – MARACOOS (principals: University of Delaware, Rutgers University).

North Carolina, Florida [South Carolina, Georgia)

Utilizing Regional Collaboration to Implement the National Disaster Recovery Framework in South Atlantic Coastal Communities

Applicant: Coastal States Stewardship Foundation

Recommended Federal Funding: \$803,713 (FY 2015)

Match: \$453,746

The disaster recovery process provides an opportunity to build long-term resilience to future hurricanes, flooding, and other hazards. Working across the four southeastern states, and in partnership with industry, regional organizations, the Federal Emergency Management Agency, and NOAA, over 30 coastal communities will build upon the foundation laid out by the Governors' South Atlantic Alliance, strengthening the region's ability to recover from the next coastal disaster in ways that protect the economy and the environment. At the completion of the project, state and local emergency managers and planners will have updated information, tools, and plans to guide the disaster recovery process. In addition, the development of a regional "resilient business advisory network" will help prepare businesses by delivering better information and advising on critical support services.

Project Partners: Southeast Coastal Ocean Observing Regional Association, state emergency management agencies, state coastal management agencies, Federal Emergency Management Agency, The Nature Conservancy, South Carolina Sea Grant Consortium, business industry partners

Florida

A Systematic and Integrated Approach to Creating More Resilient Communities in the Gulf of Mexico Region

Applicant: Gulf of Mexico Alliance

Recommended Federal Funding: \$867,700 (FY 2015)

Match: \$493,000

While significant funding may be available to communities after a disaster, there are few funding opportunities for communities that want to take proactive measures to become more resilient. Through this project, the Gulf of Mexico Alliance and partners will help ***10 Gulf of Mexico coastal communities enhance their overall resilience to future hazards through pilot projects using***

new and updated information and tools. The approach involves evaluating each community from a natural resource and human use perspective, and providing a small grant to implement cost-effective solutions to increase resilience. Project partners will also create a network to support additional regional coordination and collaboration for resilience efforts and sharing lessons learned.

Project Partners: Louisiana Coastal Protection and Restoration Authority, Mississippi Department of Marine Resources, Alabama Department of Conservation and Natural Resources, Geological Survey of Alabama, Florida Department of Environmental Protection, Mississippi-Alabama Sea Grant Consortium

New Jersey

New Jersey Fostering Regional Adaptation through Municipal Economic Scenarios (NJ FRAMES)

Applicant: New Jersey Department of Environmental Protection

Recommended Federal Funding: \$898,656 (FY 2015)

Match: \$450,344

Since Superstorm Sandy, the New Jersey Department of Environmental Protection's Coastal Management Program has worked with an extensive network of partners to reduce New Jersey coastal communities' vulnerability to coastal hazards. Through this work, the state identified comprehensive regional planning as a high-impact strategy to build coastal resilience. In partnership with several organizations, the state will work with the 15 communities that make up the Two Rivers Council of Mayors in Monmouth County to perform a stakeholder-led scenario planning process, deploy new and enhanced decision-making tools, and develop consistent state- and community-level policy and practices that support resilience and adaptation actions.

Project Partners: Jacques Cousteau National Estuarine Research Reserve, Rutgers University Climate Institute, Louis Berger, Borough of Oceanport, New Jersey

Washington

Improving Risk Communication and Leveraging Existing Programs in Washington State to Build Capacity and Enhance Resilience in Coastal Communities

Applicant: Washington Sea Grant (University of Washington)

Recommended Federal Funding: \$879,255 (FY 2016)

Match: \$442,180

Communities in Washington State face significant risk from the impacts of sea level rise, storm surges, and shoreline erosion. Washington Sea Grant will lead a partnership of state and local managers, conservation groups, and academic scientists to enhance coastal community resilience through ***cutting-edge science, community pilot projects, and revised state guidance and restoration project design. The work will increase understanding of coastal risks and impacts and improve existing planning tools.*** The effort will also include significant outreach to ensure that new information and approaches are shared with coastal communities across the state.

Project Partners: Washington State Department of Ecology's Coastal Zone Management Program, University of Washington Climate Impacts Group and other departments, Estuary and Salmon Restoration Program (Washington State Recreation and Conservation Office), Island County Department of Natural Resources, City of Tacoma, Western Washington University, and The Nature Conservancy.