

COMPENDIUM OF  
FEDERAL NATURE-BASED  
RESOURCES FOR  
COASTAL COMMUNITIES, STATES,  
TRIBES, AND TERRITORIES

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THE WHITE HOUSE  
WASHINGTON



## **White House Coastal Resilience Interagency Working Group**

National Oceanic and Atmospheric Administration

Federal Emergency Management Agency

Department of Housing and Urban Development

Department of Defense

Army Corps of Engineers

Department of the Interior

Department of Transportation

Environmental Protection Agency

National Aeronautics and Space Administration

Department of Agriculture

AmeriCorps

Department of Homeland Security



## Summary

At the coast, the impacts of climate change and more frequent and severe extreme weather events, along with sea level rise, erosion, and other stressors, are challenging—and in some cases, devastating—coastal communities, infrastructure, and the resources our economy depends on. The effects of ocean warming and sea level rise are threatening the natural and built environment, requiring strategic investments in mitigation measures that account for changing conditions. Our nation is guarding against the effects of the climate crisis by investing in resilience to climate change, through a focus on environmental justice and conservation.

Nature-based solutions are often defined as actions to protect, sustainably manage and restore natural or modified ecosystems (land, water, coastal, or ocean) that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits (e.g., coastal protection, reduced flooding, decreased heat-island effects).

The strategic and effective use of nature-based solutions plays an important role in addressing coastal resilience challenges. To aid in the use and implementation of nature-based solutions for coastal resilience, the Biden-Harris Administration has established the Coastal Resilience Interagency Working Group (IWG), one of five IWGs focused on priority extreme climate change events. The Coastal Resilience IWG is co-led by the White House Council on Environmental Quality (CEQ) and the National Oceanic and Atmospheric Administration (NOAA) and it works to coordinate and accelerate the federal government's efforts to increase resilience in the country's coasts and coastal communities that are impacted by climate change.

Nature-based solutions offer significant benefits, monetary and otherwise, often at a lower cost than more traditional infrastructure. To ensure that the advantages of infrastructure investments, including nature-based solutions, are received by historically disadvantaged and marginalized communities, the White House established the Justice40 Initiative. Justice40 is a whole-of-government effort that aims to deliver 40 percent of the overall benefit of federal investments in climate to disadvantaged communities. For nature-based solutions, these benefits include economic growth, green jobs, increased property values, and improvements to public health, including better disease outcomes and reduced injuries and loss of life.

There are many existing programs and funding sources for nature-based solutions that can target coastal resiliency. Notably, the Bipartisan Infrastructure Law (Infrastructure Investment and Jobs Act), a once-in-a-generation investment in our nation's infrastructure and competitiveness, includes \$50 billion for climate resiliency programs.

This compendium streamlines access to recommended federal resources and guidance on coastal green infrastructure, nature-based solutions, and habitat restoration that are available to assist coastal communities, states, tribes, and territories in evaluating, enabling, and investing in nature-based adaptation strategies.



<b>Abbreviation</b>	<b>Definition</b>
BIA	Bureau of Indian Affairs
BOEM	Bureau of Ocean Energy Management
BRIC	Building Resilient Infrastructure and Communities
CDBG	Community Development Block Grant
CoSMos	Coastal Storm Modeling System
CSO	Coastal States Organization
DOD	Department of Defense
DOT	Department of Transportation
EDA	Economic Development Administration
ELI	Environmental Law Institute
EPA	Environmental Protection Agency
FARG	Federal Adaptation and Resilience Group
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HUD	Department of Housing and Urban Development
NFWF	National Fish and Wildlife Foundation
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRC	Naturally Resilient Communities
NRCS	Natural Resource Conservation Service
NSTC	National Science and Technology Council
NWF	National Wildlife Federation
RiskMAP	Risk Mapping, Assessment, and Planning
TNC	The Nature Conservancy
USACE	US Army Corps of Engineers
USDA	US Department of Agriculture
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USGCRP	US Global Change Research Program
USGS	US Geological Survey



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Agency	Title	Type	Link	Summary	Year
<b>General Resources on Nature-Based Solutions and Green/Natural Infrastructure</b>					
DOD/ USACE	Engineering with Nature: Supporting Mission Resilience and Infrastructure Value at Department of Defense Installations	Reference Report	<a href="https://apps.dtic.mil/sti/pdfs/AD1150061.pdf">https://apps.dtic.mil/sti/pdfs/AD1150061.pdf</a>	Book on engineering with nature opportunities at DOD installations to reduce risk to natural hazards.	2021
DOD	Building Resilience to Climate Change Through Off-Base Natural Infrastructure Solutions	Report	<a href="https://www.repi.mil/Portals/44/Documents/Resilience/REPI_ResiliencePrimer.pdf">https://www.repi.mil/Portals/44/Documents/Resilience/REPI_ResiliencePrimer.pdf</a>	The REPI resilience primer provides information on how the REPI program can be used to implement natural infrastructure solutions to help military installations and ranges and surrounding communities adapt to climate change. This primer includes background information on how climate change is affecting the Department of Defense, how installations and partners can develop REPI resilience projects.	2021
DOD	Highlights and Examples for the Department of Defense Climate Adaptation Plan	Case Study	<a href="https://media.defense.gov/2021/Nov/03/2002886171/-1/-1/0/HIGHLIGHTS-AND-EXAMPLES-FOR-DOD-CLIMATE-ADAPTATION-PLAN.PDF">https://media.defense.gov/2021/Nov/03/2002886171/-1/-1/0/HIGHLIGHTS-AND-EXAMPLES-FOR-DOD-CLIMATE-ADAPTATION-PLAN.PDF</a>	Companion document to the Department of Defense (DOD) Climate Adaptation Plan (CAP) which highlights the Department's past successes and ongoing initiatives to address climate change considerations in the Department's plans, strategies, operations, and infrastructure.	2021



Agency	Title	Type	Link	Summary	Year
DOD	Readiness and Environmental Protection Integration (REPI) Program Resilience Resources	Tool	<a href="https://www.repi.mil/Resilience/">https://www.repi.mil/Resilience/</a>	The REPI resilience page includes materials that explain ongoing REPI resilience efforts across the country.	2020
DOT	Nature-Based Solutions for Coastal Highway Resilience: An Implementation Guide	Implementation Guidance	<a href="https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/implementation_guide/fhwahep19042.pdf">https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/implementation_guide/fhwahep19042.pdf</a>	Comprehensive guide on utilization of nature-based solutions for coastal highway resilience including technical fact sheets, planning and funding considerations, site assessment, engineering considerations, materials, construction, monitoring and maintenance information.	2019
DOT	Nature-Based Solutions for Coastal Highway Resilience	Whitepaper	<a href="https://media.coastalresilience.org/SC/FHA/Coastal_Highway_Resilience.pdf">https://media.coastalresilience.org/SC/FHA/Coastal_Highway_Resilience.pdf</a>	Whitepaper on utilization of nature-based solutions for coastal highway resilience.	2018
DOT	Peer Exchange Summary Report - Nature-Based Solutions for Coastal Highway Resilience	Peer-Exchange Summary Report	<a href="https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/coastal_highways/">https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/coastal_highways/</a>	Report summarizing key takeaways from four regional peer exchanges conducted by FHWA on NBS for improving coastal highway resilience. This peer exchange summary provides a synthesis of: key examples of NBS; recommendations for successful planning and implementation; and challenges that can arise across planning, permitting, partnerships and engagement, engineering and design, and monitoring and maintenance.	2018





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DOT	Nature-Based Solutions Pilot Reports	Report	<a href="https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/">https://www.fhwa.dot.gov/environment/sustainability/resilience/ongoing_and_current_research/green_infrastructure/</a>	Five reports describing FHWA's partnerships with state departments of transportation (DOTs) and others on five pilot projects to assess the potential for natural infrastructure to protect specific locations along coastal roads from climate change impacts such as sea level rise and storm surge flooding.	2017/2018
EPA	Watershed Planning and Green Infrastructure in State Hazard Mitigation Plans	Implementation Guidance	<a href="https://www.epa.gov/sites/default/files/2019-04/documents/final4_good_reasons_for_shmos_to_incgi_into_shmps_-_508.pdf">https://www.epa.gov/sites/default/files/2019-04/documents/final4_good_reasons_for_shmos_to_incgi_into_shmps_-_508.pdf</a>	Guide on why including green infrastructure and watershed planning into hazard mitigation plans is important.	-
EPA	Green Infrastructure Modeling Toolkit	Tool	<a href="https://www.epa.gov/water-research/green-infrastructure-modeling-toolkit">https://www.epa.gov/water-research/green-infrastructure-modeling-toolkit</a>	Website from EPA featuring tools and resources like innovative models, tools, and technologies for communities to manage water runoff in urban and other environments. The resources in this toolkit incorporate green or a combination of green and gray infrastructure practices to help communities manage their water resources in a more sustainable way, increasing resilience to future changes.	2021



Agency	Title	Type	Link	Summary	Year
EPA	Tools, Strategies and Lessons Learned from EPA Green Infrastructure Technical Assistance Projects	Report	<a href="https://www.epa.gov/green-infrastructure/tools-strategies-and-lessons-learned-epa-green-infrastructure-technical">https://www.epa.gov/green-infrastructure/tools-strategies-and-lessons-learned-epa-green-infrastructure-technical</a>	Report from EPA summarizing practical, successful solutions to inspire city managers, community leaders and engaged citizens looking to design their community space for better health, abundant water resources, and improved quality of life.	2015
EPA	EPA Green Infrastructure Resources	Broader Resource	<a href="https://www.epa.gov/green-infrastructure">https://www.epa.gov/green-infrastructure</a>	Website on EPA's green infrastructure highlighting a variety of tools, resources, and partnerships.	-
EPA	Using Trees, Vegetation, and Green Roofs to Reduce Heat Islands	Implementation Guidance	<a href="https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands">https://www.epa.gov/heat-islands/using-trees-and-vegetation-reduce-heat-islands</a> <a href="https://www.epa.gov/heat-islands/using-green-roofs-reduce-heat-islands">https://www.epa.gov/heat-islands/using-green-roofs-reduce-heat-islands</a>	Webpages and guidebook chapters with basic info on the role of trees, vegetation, and green roofs in mitigating the heat island effect, including benefits, key implementation considerations, cost-benefit information, and local policy options.	-
EPA	Smart Growth Fixes for Climate Adaptation and Resilience	Toolkit	<a href="https://www.epa.gov/smartgrowth/smart-growth-fixes-climate-adaptation-and-resilience">https://www.epa.gov/smartgrowth/smart-growth-fixes-climate-adaptation-and-resilience</a>	Describes specific changes communities could make to their land use and building policies to prepare for climate change while gaining other environmental, economic, health, and social benefits in the short and long terms.	2017



Agency	Title	Type	Link	Summary	Year
EPA	Enhancing Sustainable Communities With Green Infrastructure	Toolkit	<a href="https://www.epa.gov/martgrowth/enhancing-sustainable-communities-green-infrastructure">https://www.epa.gov/martgrowth/enhancing-sustainable-communities-green-infrastructure</a>	Describes how to develop a vision and plan that integrate green infrastructure and sustainable communities strategies for multiple benefits, including mitigating and adapting to climate change.	2014
EPA	City Green: Innovative Green Infrastructure Solutions for Downtowns and Infill Locations	Case Study	<a href="https://www.epa.gov/martgrowth/city-green-innovative-green-infrastructure-solutions-downtowns-and-infill-locations">https://www.epa.gov/martgrowth/city-green-innovative-green-infrastructure-solutions-downtowns-and-infill-locations</a>	Case studies of projects around the country that illustrate how green infrastructure techniques can be used on sites that have limited space and other constraints to bring environmental and community benefits.	2016
EPA	Regulations and End-Use Specifications Explorer (REUSExplorer)	Tool	<a href="https://www.epa.gov/waterreuse/regulations-and-end-use-specifications-explorer-reuseexplorer">https://www.epa.gov/waterreuse/regulations-and-end-use-specifications-explorer-reuseexplorer</a>	Compiles state-level regulations and guidelines for different sources of water reuse applications to assist states in developing regulations and help utilities and practitioners to understand current regulations. This includes potable and nonpotable water reuse applications that can utilize nature-based solutions such as constructed wetlands and soil aquifer treatment.	2022
EPA	Climate Ready Estuaries Rolling Easements	Implementation Guidance	<a href="https://www.epa.gov/cr/estuarine-rolling-easements-primer">https://www.epa.gov/cr/estuarine-rolling-easements-primer</a>	More than a dozen land use and legal tools for ensuring that intertidal habitats can persist as sea level rises.	2011



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FEMA	Compiled Resources on Future Conditions and Nature-based Solutions	Broader Resource	<a href="https://www.fema.gov/sites/default/files/2020-08/fema_bric-and-nature-based-solutions_resource-materials_July_2020.pdf">https://www.fema.gov/sites/default/files/2020-08/fema_bric-and-nature-based-solutions_resource-materials_July_2020.pdf</a>	Table outlining available resources for FEMA's BRIC program.	2020
FEMA	Building Community Resilience with Nature-Based Solutions: A Guide for Local Communities	Implementation Guidance	<a href="https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf">https://www.fema.gov/sites/default/files/documents/fema_riskmap-nature-based-solutions-guide_2021.pdf</a>	Guidebook to utilizing nature-based solutions for hazard mitigation describing: what are nature-based solutions, what is the business case for using them, planning and policy considerations, implementation considerations, and federal funding opportunities, produced by FEMA RiskMAP for BRIC.	2021
HUD	Green Infrastructure and the Sustainable Communities Initiative	Report	<a href="https://www.hud.gov/sites/documents/GREENINFRASTRUCTSCI.PDF">https://www.hud.gov/sites/documents/GREENINFRASTRUCTSCI.PDF</a>	Report sharing the green infrastructure best practices and outputs of HUD grantees under the HUD Sustainable Communities Initiative grant programs as part of HUD's commitment under the Green Infrastructure Collaborative.	2011
HUD/EP A	Navigating Federal Funding for Green Infrastructure and Nature-Based Solutions	Training Webinar	<a href="https://www.hudexchange.info/trainings/courses/navigating-federal-funding-for-green-infrastructure-and-nature-based-solutions1/">https://www.hudexchange.info/trainings/courses/navigating-federal-funding-for-green-infrastructure-and-nature-based-solutions1/</a>	Training webinar hosted by the Green Infrastructure Federal Collaborative federal agencies discussed funding and technical assistance opportunities that advance the implementation of green infrastructure and nature-based solutions.	2021



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NOAA	Fast Facts on Natural Infrastructure	Fact Sheet	<a href="https://coast.noaa.gov/states/fast-facts/natural-infrastructure.html">https://coast.noaa.gov/states/fast-facts/natural-infrastructure.html</a>	NOAA Digital Coast webpage displaying quick facts, figures, statistics, benefits, and examples of nature-based solutions.	-
NOAA	Guide to Assessing Green Infrastructure Costs and Benefits for Flood Reduction	Implementation Guidance	<a href="https://coast.noaa.gov/data/digitalcoast/pdf/green-infrastructure-cost-benefit.pdf">https://coast.noaa.gov/data/digitalcoast/pdf/green-infrastructure-cost-benefit.pdf</a>	Guidebook featuring an overview of types of green infrastructure used to reduce flooding with benefits, limitations and maintenance outlined for each, planning considerations for green infrastructure, tips on estimating storage potential and costs.	2015
NOAA	Green Infrastructure Protective Services Animation	Training and Learning Resources	<a href="https://coast.noaa.gov/greeninfrastructurevis/">https://coast.noaa.gov/greeninfrastructurevis/</a>	Video explaining green infrastructure and how it protects communities from coastal storms. The video also provides information about actions communities can take to reap the benefits from nature-based protection technique.	-
NOAA	Nature-Based Solutions for Coastal Hazards: The Basics	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/nbs-basics.html">https://coast.noaa.gov/digitalcoast/training/nbs-basics.html</a>	NOAA Digital Coast self-guided online module to identify a community's coastal hazard issues, ecosystem services that can reduce hazard impacts, and green infrastructure practices that can provide those services, and develop the beginnings of a community green infrastructure plan.	-



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NOAA	Nature-Based Solutions for Coastal Hazards	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/green.html">https://coast.noaa.gov/digitalcoast/training/green.html</a>	NOAA Digital Coast training to prepare coastal planners and managers for implementing green or natural infrastructure projects to reduce coastal natural hazards in their communities.	-
NOAA	Green Infrastructure Effectiveness Database	Database	<a href="https://coast.noaa.gov/digitalcoast/training/gi-database.html">https://coast.noaa.gov/digitalcoast/training/gi-database.html</a>	Database of literature sources from NOAA containing information on the effectiveness of green infrastructure to reduce the impacts of coastal hazards, such as inundation and erosion from tropical storms and cyclones, more frequent precipitation events, and sea level rise.	2021
NOAA	Green Infrastructure Mapping Guide	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/gi-mapping.html">https://coast.noaa.gov/digitalcoast/training/gi-mapping.html</a>	NOAA Digital Coast self-guided online module to learn a process for mapping green infrastructure priorities using spatial data and consider climate and hazard impacts.	-
NOAA	Green Infrastructure Peer-to-Peer Case Studies	Case Study	<a href="https://coast.noaa.gov/digitalcoast/training/toledo-green-infrastructure.html">https://coast.noaa.gov/digitalcoast/training/toledo-green-infrastructure.html</a>	Case studies that illustrate community implementation of green infrastructure and lessons learned along the way.	-
NOAA	How to Map Open Space for Community Rating System Credit	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/crs.html">https://coast.noaa.gov/digitalcoast/training/crs.html</a>	Tool that walks communities through interactive steps to map their existing and potential open space for credit through FEMA's Community Rating System.	-



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NOAA/ BOEM	Ocean Report Web Tool	Tool	<a href="https://coast.noaa.gov/digitalcoast/tools/ort.html">https://coast.noaa.gov/digitalcoast/tools/ort.html</a>	Web-based, report-centric tool that provides coastal and ocean planners with a high-level analysis for their custom-drawn area of interest through infographics on: general information, energy and minerals, natural resources and conservation, oceanographic and biophysical, transportation and infrastructure, and economics and commerce.	-
NOAA/ EPA	Coastal & Waterfront Smart Growth	Training and Learning Resources	<a href="https://coastalsmartgrowth.noaa.gov/welcome.html">https://coastalsmartgrowth.noaa.gov/welcome.html</a>	Tools, techniques, and case studies regarding resiliency options for coastal & waterfront communities.	2009
NPS	Planning Tools for Green Infrastructure	Training and Learning Resources	<a href="https://www.nps.gov/articles/000/c2-nps-planning.htm">https://www.nps.gov/articles/000/c2-nps-planning.htm</a> <a href="https://www.nps.gov/articles/000/c2-nps-planning.htm">https://www.nps.gov/articles/000/c2-nps-planning.htm</a>	Planning tools for utilizing green infrastructure.	2021
NPS	Coastal Adaptation Strategies Handbook	Broader Resource	<a href="https://irma.nps.gov/DaStore/Reference/Profile/2239245">https://irma.nps.gov/DaStore/Reference/Profile/2239245</a>	Handbook from NPS that captures current understanding of a rapidly developing field as it relates to coastal parks; identifies tools and strategies; provides examples of approaches that the NPS as an agency and individual parks are using to address coastal vulnerabilities and climate change impacts; and provides policy and decision-making guidelines.	2016



Agency	Title	Type	Link	Summary	Year
NSTC	Research Needs for Coastal Green Infrastructure	Report	<a href="https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/cgies_research_agenda_final_082515.pdf">https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/cgies_research_agenda_final_082515.pdf</a>	Report from NSTC outlining the needs for prioritized federal research to support the integration of green infrastructure into resilience and risk reduction planning, and decision making.	2015
USACE	International Guidelines on NNBF for Flood Risk Management	Implementation Guidance	<a href="https://ewn.ercd.dren.mil/?page_id=5630">https://ewn.ercd.dren.mil/?page_id=5630</a>	USACE International Guidelines on natural and nature-based solutions for Flood Risk Management	2021
USACE	Engineering with Nature: Atlas	Reference	<a href="https://ewn.ercd.dren.mil/?page_id=4174">https://ewn.ercd.dren.mil/?page_id=4174</a>	USACE Atlas 1 and 2 of Engineering with Nature principles and practices in action through illustrations and descriptions of a combined 118 constructed projects around the world. Fifty of these projects were built by USACE at sites across the country.	2018/ 2021
USACE	Engineering with Nature: Project Mapper	Tool	<a href="https://ewn.ercd.dren.mil/?page_id=2549">https://ewn.ercd.dren.mil/?page_id=2549</a>	Map provides case studies of water resource projects that incorporate sustainability or supplemental environmental or social benefits into their design in addition to the primary navigation, shore protection, or other civil works project purpose. In addition to EWN project sites, ProMap also incorporates Working with Nature (WwN) and EcoShape case studies.	-





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USACE	Use of Natural and Nature-based Features (NNBF) for Coastal Resilience	Report	<a href="https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/3442/">https://usace.contentdm.oclc.org/digital/collection/p266001coll1/id/3442/</a>	Report on uses of natural and nature-based features for coastal resilience.	2015
USACE	Natural Infrastructure Opportunities Tool	Tool	<a href="https://www.arcgis.com/apps/MapSeries/index.html?appid=18079f5b628b4a7bb52acbe089d80886">https://www.arcgis.com/apps/MapSeries/index.html?appid=18079f5b628b4a7bb52acbe089d80886</a>	Online tool from USACE outlining available resources for natural infrastructure projects including the movement and content of dredged material through placement area capacities, dredging plans, and sediment characteristic descriptions and help to identify beneficial use and infrastructure opportunities.	-
USDA	Compendium of Adaptation Approaches	Implementation Guidance	<a href="https://www.fs.usda.gov/ccrc/climate-projects/adaptation-approaches">https://www.fs.usda.gov/ccrc/climate-projects/adaptation-approaches</a>	Compendium of adaptation approaches to help natural resource managers and landowners identify actions for responding to climate change, produced by the USDA USFS.	-
USDA	Identification, Mitigation, and Adaptation to Salinization on Working Lands in the U.S. Southeast	Reference	<a href="https://www.fs.usda.gov/research/treesearch/61766">https://www.fs.usda.gov/research/treesearch/61766</a>	Reference website from USDA with report on identifying, mitigating, and adapting to salinization on working agricultural lands, with additional resources to learn more about salt water inundation, sea level, rise and adaptation strategies.	2021



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DOI-FWS, NFWF	Evaluation of the DOI Hurricane Sandy Coastal Resilience Program	Reference	<a href="https://storymaps.arcgis.com/stories/47994f3bf56b49c4ad5065813aa82595sandy/Documents/hurricane-sandy-beach-dune-restoration-case-study.pdf">https://storymaps.arcgis.com/stories/47994f3bf56b49c4ad5065813aa82595sandy/Documents/hurricane-sandy-beach-dune-restoration-case-study.pdf</a>	Evaluation of the DOI Hurricane Sandy Coastal Resilience Program - between 2013 and 2016, the Hurricane Sandy Program, administered through both the Department of Interior (DOI) and NFWF, invested more than \$302 million to support 160 projects designed to improve the resilience of ecosystems and communities to coastal storms and sea level rise.	2013-2023
DOI-FWS, NFWF	Hurricane Sandy Monitoring and Evaluation Case Studies and Report	Case Study	<a href="https://www.nfwf.org/node/1345/hurricane-sandy-monitoring-and-evaluation">https://www.nfwf.org/node/1345/hurricane-sandy-monitoring-and-evaluation</a>	DOI and NFWF commissioned an external evaluation of the 160 projects. The evaluation includes a main report as well as six in-depth case studies, each of which is focused on understanding the impacts and effectiveness of projects within a specific activity category.	2019
FEMA	FEMA Nature-Based Solutions	Broader Resource	<a href="https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions">https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions</a>	Website for FEMA's resources on nature-based solutions. Provides case studies, guidance, and funding information.	-
<b>Climate Adaptation Resources to Inform Nature-Based Solution Projects</b>					
NOAA	Climate Resilience Toolkit	Broader Resource	<a href="https://toolkit.climate.gov/">https://toolkit.climate.gov/</a>	Comprehensive NOAA website/toolkit providing resources, tools, and studies on resilience, climate science, and adaptation.	2021
USDA	Climate Change Resource Center	Broader Resource	<a href="https://www.fs.usda.gov/ccrc/">https://www.fs.usda.gov/ccrc/</a>	Website on USDA climate resource center with regionally and topically specific resources.	-



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USDA	Conservation Webinar Portal	Training and Learning Resources	<a href="https://conservationwebinars.net/">https://conservationwebinars.net/</a>	Conservation webinar portal with resources on upcoming trainings and current resources on land and resource management.	-
USDA	Climate Adaptation Actions for Urban Forests and Human Health	Training and Learning Resources	<a href="https://www.climatehubs.usda.gov/hubs/north-horn-forests/topic/climate-adaptation-actions-urban-forests-and-human-health">https://www.climatehubs.usda.gov/hubs/north-horn-forests/topic/climate-adaptation-actions-urban-forests-and-human-health</a>	USDA Hub which describes diverse actions that address climate change in urban forest management. This flexible resource synthesizes a wide range of peer-reviewed research, evidence-based reports, and emerging best practices on climate change adaptation, urban forest management, and human health impacts.	-
USDA and partners	The Adaptation Workbook	Training and Learning Resources	<a href="https://adaptationworkbook.org/">https://adaptationworkbook.org/</a>	Workbook from USDA with adaptation strategies and approaches applicable to land stewardship and conservation in rural and urban areas.	-
FEMA	Guide to Expanding Mitigation – Making the Connection to the Coast	General Guidance	<a href="https://www.fema.gov/sites/default/files/documents/fema_mitigation-guide_coast.pdf">https://www.fema.gov/sites/default/files/documents/fema_mitigation-guide_coast.pdf</a>	Guidance for expanding coastal communities to work together to align mitigation and coastal zone management, including nature-based solutions.	2022



Agency	Title	Type	Link	Summary	Year
EPA	Climate Change Adaptation Resource Center (ARC-X)	Tool	<a href="https://www.epa.gov/arc-x">https://www.epa.gov/arc-x</a>	An interactive resource to help local governments effectively deliver services to their communities even as the climate changes. Decision makers can create an integrated package of information information about: the risks posed by climate change to the issues of concern; relevant adaptation strategies; case studies illustrating how other communities have successfully adapted to those risks and tools to replicate their successes; and EPA funding opportunities.	2018
<b>Funding, Financing, and Valuing Nature-Based Solution Projects</b>					
NOAA	Economic Guidance for Coastal Management Professionals	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/econ-guidance.html">https://coast.noaa.gov/digitalcoast/training/econ-guidance.html</a>	NOAA Digital Coast training which provides information about a benefits-cost analysis, economic impact analysis, cost-effectiveness analysis, and more. Understanding these basics will help participants identify the appropriate approach and the data needed.	2021
NOAA	Economic Valuation Self-Guided Module and Associated Guidance Documents	Training and Learning Resources	<a href="http://coast.noaa.gov/digitalcoast/training/econ-decisions.html">http://coast.noaa.gov/digitalcoast/training/econ-decisions.html</a>	NOAA Digital Coast training to provide information about benefit-cost analysis, economic impact analysis, and cost-effectiveness analysis, and to identify further data needed.	2021



Agency	Title	Type	Link	Summary	Year
NOAA	Funding and Financing Coastal Resilience Webinars	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/funding-webinars.html">https://coast.noaa.gov/digitalcoast/training/funding-webinars.html</a>	NOAA Digital Coast learning products that provide audiences with the recordings, panel highlights, and resources from webinars on financing coastal resilience projects, including nature-based solutions.	-
NOAA	Funding and Financing: Options and Considerations for Coastal Resilience Projects	Funding Guidance	<a href="https://coast.noaa.gov/data/digitalcoast/pdf/financing-resilience.pdf">https://coast.noaa.gov/data/digitalcoast/pdf/financing-resilience.pdf</a>	Outlines a wide variety of funding opportunities for coastal resilience projects, with an eye toward opportunities for nature-based solution projects.	2021
NOAA	Economic Valuation of Shoreline Protection within the Jacques Cousteau NERR	Technical Memo	<a href="https://coastalscience.noaa.gov/data_reports/economic-valuation-shoreline-protection-within-jacques-cousteau-national-estuarine-reserve/">https://coastalscience.noaa.gov/data_reports/economic-valuation-shoreline-protection-within-jacques-cousteau-national-estuarine-reserve/</a>	Technical memo from NOAA focused on the ecosystem of coastal habitats (e.g., seagrass beds, marshes, and coastal forests), which operate as natural infrastructure, and can benefit coastal communities, other types of human development, and economic activity by reducing the impacts of coastal hazards.	2017
NOAA	Nature-Based Solutions: Benefits, Costs, and Economic Assessments	Training and Learning Resources	<a href="https://coast.noaa.gov/digitalcoast/training/gi-practices-and-benefits.html">https://coast.noaa.gov/digitalcoast/training/gi-practices-and-benefits.html</a>	Series of quick references on green infrastructure practices and benefits, installation and maintenance costs, and tips for conducting an economic assessment.	-
NOAA	Green Infrastructure Options to Reduce Flooding	Implementation Guidance	<a href="https://coast.noaa.gov/data/digitalcoast/pdf/gi-reduce-flooding.pdf">https://coast.noaa.gov/data/digitalcoast/pdf/gi-reduce-flooding.pdf</a>	Handout to reduce flooding and help communities design a green infrastructure strategy. Companion piece to the Process Guide for Assessing Costs and Benefits of Green Infrastructure for Flood Mitigation	-



Agency	Title	Type	Link	Summary	Year
NOAA	Estimating the Local Marine Economy-Telling Your Story	Training	<a href="https://coast.noaa.gov/digitalcoast/training/marine-economy-virtual.html">https://coast.noaa.gov/digitalcoast/training/marine-economy-virtual.html</a>	A training course to help participants tell a compelling story about the importance of their waterfront by identifying local marine jobs and using local economic data.	-
FEMA	FEMA Resources for Climate Resilience	General Guidance	<a href="https://www.fema.gov/sites/default/files/documents/fema_resources-climate-resilience.pdf">https://www.fema.gov/sites/default/files/documents/fema_resources-climate-resilience.pdf</a>	Summarizes how FEMA resources can be used to help communities mitigate the impacts of climate change, including information on Nature-Based Solutions.	2021
FEMA	FEMA's Ecosystem Service Value Updates	Report	<a href="https://www.fema.gov/sites/default/files/documents/fema_ecosystem-service-value-updates_2022.pdf">https://www.fema.gov/sites/default/files/documents/fema_ecosystem-service-value-updates_2022.pdf</a>	Report updating and expanding FEMA's Ecosystem Service Values for demonstrating cost effectiveness in FEMA's Benefit Cost Analysis (BCA) Toolkit	2022
FEMA	Mitigation Action Portfolio	Training	<a href="https://www.fema.gov/sites/default/files/documents/feam_fy21-bric-mitigation-action-portfolio.pdf">https://www.fema.gov/sites/default/files/documents/feam_fy21-bric-mitigation-action-portfolio.pdf</a>	HMA's Mitigation Action Portfolio was created to introduce stakeholders to an array of hazard mitigation activities. The portfolio highlights case studies using nature-based solutions and other innovative techniques to mitigate against natural hazards.	2021
EPA	Clearinghouse for Environmental Finance	Resource	<a href="https://www.epa.gov/waterfinancecenter/water-finance-clearinghouse">https://www.epa.gov/waterfinancecenter/water-finance-clearinghouse</a>	The Water Finance Clearinghouse provides a database with more than \$10 billion in water funding sources and over 550 resources to support local water infrastructure projects, including stormwater/green infrastructure funding.	-



Agency	Title	Type	Link	Summary	Year
EPA	Green Infrastructure Funding Opportunities	Resource	<a href="https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities">https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities</a>	List of EPA as associated funding sources.	-
<b>Coastal Hazards and Coastal Change Resources to Inform Nature-Based Solution Projects</b>					
NOAA	Coastal Flood Exposure Mapper	Tool	<a href="https://coast.noaa.gov/digitalcoast/tools/flood-exposure.html">https://coast.noaa.gov/digitalcoast/tools/flood-exposure.html</a>	Interactive map from NOAA that helps communities see where people, places, and natural resources are exposed to flood hazards and where natural areas can provide protection.	-
NOAA	Sea Level Rise Viewer	Tool	<a href="https://coast.noaa.gov/digitalcoast/tools/slr.html">https://coast.noaa.gov/digitalcoast/tools/slr.html</a>	Use this web mapping tool to visualize community-level impacts from coastal flooding or sea level rise (up to 10 feet above average high tides). Photo simulations of how future flooding might impact local landmarks are also provided, as well as data related to water depth, connectivity, flood frequency, socio-economic vulnerability, wetland loss and migration, and mapping confidence.	-



Agency	Title	Type	Link	Summary	Year
NOAA	Coastal Change Analysis Land Cover Atlas	Tool	<a href="https://coast.noaa.gov/digitalcoast/tools/lca.html">https://coast.noaa.gov/digitalcoast/tools/lca.html</a>	Online data viewer for user-friendly access to coastal land cover and land cover change information. The tool summarizes general change trends (such as forest losses or new development) and provides tables, maps, and reports to enhance communication and decision-making.	-
USDA	Hurricane Preparation and Recovery Commodity Guides	Tool	<a href="https://www.climatehubs.usda.gov/index.php/hubs/southeast/topic/hurricane-preparation-and-recovery-southeast-us">https://www.climatehubs.usda.gov/index.php/hubs/southeast/topic/hurricane-preparation-and-recovery-southeast-us</a>	Interactive tool to help producers remain resilient and productive in the face of this threat, the USDA Southeast Climate Hub, along other USDA agencies and university extension experts, developed the following guides to help you prepare for and recover from hurricane events.	-
USDA	Saltwater Intrusion and Salinization on Coastal Forests and Farms	Guidance	<a href="https://www.climatehubs.usda.gov/index.php/hubs/southeast/topic/saltwater-intrusion-and-salinization-coastal-forests-and-farms">https://www.climatehubs.usda.gov/index.php/hubs/southeast/topic/saltwater-intrusion-and-salinization-coastal-forests-and-farms</a>	How to identify the stage, cause, and likely progression of salinization on working lands, mitigation options if possible, and if not, adaptation strategies that are available.	-
USGS	Coastal Storms - Prediction of Flooding Now and Into the Future	Training and Learning Resources	<a href="https://www.usgs.gov/centers/pcm/science/coastal-storm-modeling-system-cosmos">https://www.usgs.gov/centers/pcm/science/coastal-storm-modeling-system-cosmos</a>	Story map on future of coastal flooding and USGS CoSMoS tool.	-
USGS	National Shoreline Change - From the 1800s To the Present	Training and Learning Resources	<a href="https://www.usgs.gov/tools/national-shoreline-change">https://www.usgs.gov/tools/national-shoreline-change</a>	Story map of national shoreline change and data highlights of USGS data.	-





Agency	Title	Type	Link	Summary	Year
USGS	Real-time Forecasts of Coastal Change	Training and Learning Resources	<a href="https://www.usgs.gov/tools/real-time-forecasts-coastal-change">https://www.usgs.gov/tools/real-time-forecasts-coastal-change</a>	Story map of real-time forecast of coastal change and hazards.	-
USGS	USGS Coastal Change Hazards Portal	Tool	<a href="https://marine.usgs.gov/coastalchangehazardportal/">https://marine.usgs.gov/coastalchangehazardportal/</a>	Map application on the USGS Coastal Hazards Portal with info on specific hurricanes, extreme storms, sea level rise, and shoreline change.	2021
USGS	Sea-Level Change: An Interactive Guide to Global and Regional Sea Level Rise Scenarios for the United States	Tool	<a href="https://www.usgs.gov/tools/sea-level-change-interactive-guide-global-and-regional-sea-level-rise-scenarios-united-states">https://www.usgs.gov/tools/sea-level-change-interactive-guide-global-and-regional-sea-level-rise-scenarios-united-states</a>	Story map from USGS on sea level change, featuring regional and global sea level rise scenarios.	-
<b>Guidance on Nature-Based Coastal Habitat Restoration</b>					
Ameri Corps	Impact Evaluation on WA Conservation Corps Restoration Methods	Report	<a href="https://americorps.gov/sites/default/files/document/2018_10_25_WAStateDeptofEcology_WAConservationCorps_ImpactEvaluationReport_19ES208650_Report2_Revised_508_0RE.pdf">https://americorps.gov/sites/default/files/document/2018_10_25_WAStateDeptofEcology_WAConservationCorps_ImpactEvaluationReport_19ES208650_Report2_Revised_508_0RE.pdf</a>	Report from the AmeriCorps Evidence Exchange that evaluates techniques to improve plan survival and reduce invasive species, including in coastal areas.	-
Ameri Corps	Impact Evaluation on EarthCorps Restoration Methods	Report	<a href="https://americorps.gov/evidence-exchange/impact-evaluation-report-earthcorps-restoration-methods">https://americorps.gov/evidence-exchange/impact-evaluation-report-earthcorps-restoration-methods</a>	Report from the AmeriCorps Evidence Exchange that evaluates techniques to improve plan survival and reduce invasive species, including in coastal areas.	-



Agency	Title	Type	Link	Summary	Year
NOAA	Monitoring and Evaluation for Restoration Projects	Monitoring & Evaluation Guidance	<a href="https://www.fisheries.noaa.gov/national/habitat-conservation/monitoring-and-evaluation-restoration-projects">https://www.fisheries.noaa.gov/national/habitat-conservation/monitoring-and-evaluation-restoration-projects</a>	Website with guidance on restoration, monitoring, evaluation, and feedback for habitat restoration projects. Website managed by the NOAA Fisheries Restoration Center.	2021
NOAA	Restoration Atlas	Map	<a href="https://www.fisheries.noaa.gov/resource/map/restoration-atlas">https://www.fisheries.noaa.gov/resource/map/restoration-atlas</a>	An interactive map that helps users find habitat restoration projects by habitat type, location, or congressional district.	-
NOAA	Science-Based Restoration Monitoring of Coastal Habitat Volume 1 (2003): Framework for Monitoring Plans Under the Estuaries and Clean Water Act of 2000	Monitoring & Evaluation Guidance	<a href="https://repository.library.noaa.gov/view/noaa/439">https://repository.library.noaa.gov/view/noaa/439</a>	Monitoring framework from NOAA that provides technical assistance, outlines necessary steps, and provides useful tools for the development and implementation of sound scientific monitoring of coastal restoration efforts.	2003
NOAA	Science-Based Restoration Monitoring of Coastal Habitat Volume 2 (2005): Tools for Monitoring Coastal Habitats	Monitoring & Evaluation Guidance	<a href="https://coastalscience.noaa.gov/data_reports/science-based-restoration-monitoring-of-coastal-habitats-volume-two-tools-for-monitoring-coastal-habitats/">https://coastalscience.noaa.gov/data_reports/science-based-restoration-monitoring-of-coastal-habitats-volume-two-tools-for-monitoring-coastal-habitats/</a>	Monitoring framework from NOAA that provides technical assistance, outlines necessary steps, and provides useful tools for the development and implementation of sound scientific monitoring of coastal restoration efforts.	2005
NOAA/USFWS	Restoration Webinar Series	Training and Learning Resources	<a href="https://www.fisheries.noaa.gov/feature-story/restoration-webinars-share-best-practices-across-nation">https://www.fisheries.noaa.gov/feature-story/restoration-webinars-share-best-practices-across-nation</a>	Webinar series from the National Conservation Training Center (hosted by NOAA and USFWS) on specific nature-based projects from urban wetlands to oyster reef implementation.	2021



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USDA	Soil Survey Web Tool	Tool	<a href="https://casoilresource.lawr.ucdavis.edu/gmap/">https://casoilresource.lawr.ucdavis.edu/gmap/</a>	Interactive map allows you to explore USDA-National Cooperative Soil Survey data for locations throughout the U.S.	-
USGS/ USFWS	Monitoring Habitat Restoration Projects: U.S. Fish and Wildlife Pacific Region Partners	Monitoring Guidance	<a href="https://pubs.usgs.gov/tm/tm2a11/pdf/tm2a11.pdf">https://pubs.usgs.gov/tm/tm2a11/pdf/tm2a11.pdf</a>	Guide on techniques and methods for monitoring habitat restoration projects from USFWS programs.	2011
EPA/FH WA	Tidal Restriction Synthesis Review	Broader Resource	<a href="https://www.epa.gov/sites/default/files/2020-12/documents/tidal_restrictions_synthesis_review_final_12.01.20.pdf">https://www.epa.gov/sites/default/files/2020-12/documents/tidal_restrictions_synthesis_review_final_12.01.20.pdf</a>	Summarizes the state of knowledge of tidal restriction extent and their potential effects on the coastal environment, identifies needs and provides recommendations for tidal restriction avoidance and removal when practicable. Also contains a list of potential mechanisms for funding tidal restriction removal.	2020
EPA	Synthesis of Adaptation Options for Coastal Areas	Reference	<a href="https://www.epa.gov/cr/synthesis-adaptation-options-coastal-areas">https://www.epa.gov/cr/synthesis-adaptation-options-coastal-areas</a>	This guide provides a brief introduction to physical impacts of climate change on estuaries and a review of on-the-ground adaptation options available to coastal managers to reduce their systems' vulnerability to climate change impacts.	2009



Agency	Title	Type	Link	Summary	Year
DOI	Case Study: Advancing Coastal Resilience Science through Data, Mapping, and Modeling in the Hurricane Sandy Coastal Resilience Program	Case Study	<a href="https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-coastal-science-case-study.pdf">https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-coastal-science-case-study.pdf</a>	This case study forms part of a larger 2019 evaluation of the Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program) of the U.S. Department of the Interior (DOI) and the National Fish and Wildlife Foundation (NFWF). It provides an analysis of the contributions of coastal resilience science projects to the program's overall objectives.	-
<b>Nature-Based Solutions in Barrier Island and Island Environments</b>					
NFWF/ USACE/ USGS	Alabama Barrier Island Restoration Assessment	Tool	<a href="https://cesamusace.maps.arcgis.com/apps/MapSeries/index.html?appid=ea29cd4e1f3b432e8c520df3fb7a9f8b">https://cesamusace.maps.arcgis.com/apps/MapSeries/index.html?appid=ea29cd4e1f3b432e8c520df3fb7a9f8b</a>	Interactive tool to depict an Alabama barrier island restoration project from USACE, USGS, and NFWF.	-
NPS	Coastal and Barrier Network Geomorphological Monitoring Protocol	Monitoring Guidance	<a href="https://irma.nps.gov/DataStore/DownloadFile/649620">https://irma.nps.gov/DataStore/DownloadFile/649620</a>	Protocols for shoreline monitoring for coastal and barrier NPS shorelines.	2010
NPS	Fire Island National Seashore Breach Management Plan/EIS	Management Plan	<a href="http://npshistory.com/publications/fiis/gmp-eis-abbrev-2016.pdf">http://npshistory.com/publications/fiis/gmp-eis-abbrev-2016.pdf</a>	Planning and monitoring resources and protocols from NPS for management of Fire Island.	-
USFWS/ USGS	Impacts of Sediment Removal from and Placement in Coastal Barrier Island Systems	Fact sheet	<a href="https://www.fws.gov/cbra/documents/FAQs-USGS-FWS-Coastal-Barrier-Report.pdf">https://www.fws.gov/cbra/documents/FAQs-USGS-FWS-Coastal-Barrier-Report.pdf</a>	Question and answer report on impacts of sediment removal in coastal barrier island systems, outlining the 5 key findings of the report, prepared by USGS and USFWS.	2021



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USGS/ USFWS	Impacts of Sediment Removal from and Placement in Coastal Barrier Island Systems	Report	<a href="https://pubs.usgs.gov/of/2021/1062/ofr20211062.pdf">https://pubs.usgs.gov/of/2021/1062/ofr20211062.pdf</a>	Report on the impact of sediment removal and placement in the Coastal Barrier Island System from USGS and USFWS.	2021
USGS	Research Monitoring of Barrier Islands	Training and Learning Resources	<a href="https://www.usgs.gov/centers/spcm/science/barrier-island-comprehensive-monitoring">https://www.usgs.gov/centers/spcm/science/barrier-island-comprehensive-monitoring</a>	Story map on barrier islands.	-
USGS	Barrier Island Comprehensive Monitoring	Report	<a href="https://www.usgs.gov/centers/spcm/science/barrier-island-comprehensive-monitoring">https://www.usgs.gov/centers/spcm/science/barrier-island-comprehensive-monitoring</a>	Historical and newly acquired data were used to assess and monitor changes in the aerial and subaqueous extent of islands, habitat types, sediment properties, environmental processes, and vegetation composition.	2018

## Beach Nourishment and Sediment Removal Resources to Inform Nature-Based Solution Projects

BOEM	Economic and Geomorphic Comparison of Sand for Coastal Restoration Projects	Report	<a href="https://espis.boem.gov/final%20reports/BOEM_2020-035.pdf">https://espis.boem.gov/final%20reports/BOEM_2020-035.pdf</a>	Report comparing nearshore and offshore sand for utilization in coastal restoration projects.	2020
BOEM	BOEM Marine Minerals Overview	Fact Sheet	<a href="https://www.boem.gov/sites/default/files/documents/newsroom/fact-sheets/BOEM-FactSheet-Marine-Minerals_1.pdf">https://www.boem.gov/sites/default/files/documents/newsroom/fact-sheets/BOEM-FactSheet-Marine-Minerals_1.pdf</a>	Fact sheet BOEM's approach, tools and programs critical to outer continental shelf non-energy marine mineral management which are key to coastal restoration projects.	2021



Agency	Title	Type	Link	Summary	Year
BOEM	BOEM Marine Minerals Program	Fact Sheet	<a href="https://www.boem.gov/sites/default/files/documents/marine-minerals/MMP-Factsheet-FastFacts.pdf">https://www.boem.gov/sites/default/files/documents/marine-minerals/MMP-Factsheet-FastFacts.pdf</a>	Fact sheet on BOEM Marine Minerals program and why and how non-energy marine minerals are important and managed.	2020
BOEM	Marine Minerals Information System (MMIS)	Fact Sheet	<a href="https://www.boem.gov/sites/default/files/documents/marine-minerals/BOEM-MMIS.pdf">https://www.boem.gov/sites/default/files/documents/marine-minerals/BOEM-MMIS.pdf</a>	Fact sheet on BOEM's Marine Mineral Information System, available tools, how it works, who utilizes it and information it can provide.	-
BOEM	BOEM Marine Minerals Information Systems (MMIS)	Tool	<a href="https://mmis.doi.gov/boemmmis/">https://mmis.doi.gov/boemmmis/</a>	Interactive tool from BOEM that provides public access to data and information relevant to offshore mineral resources throughout the United States, including sand/sediment resources for Coastal Resilience and Stewardship, Infrastructure Protection, Ecosystem Restoration, and Habitat Creation.	-
BOEM	Marine Mineral Studies	Broader Resource	<a href="https://www.boem.gov/marine-minerals/marine-mineral-research-studies/marine-mineral-environmental-studies">https://www.boem.gov/marine-minerals/marine-mineral-research-studies/marine-mineral-environmental-studies</a>	Website from BOEM on marine mineral studies and locally specific efforts.	-
NPS	Beach Nourishment Guidance	Implementation Guidance	<a href="https://irma.nps.gov/DataStore/DownloadFile/455109">https://irma.nps.gov/DataStore/DownloadFile/455109</a>	Technical guidance by NPS for beach nourishment including tools for resource managers to interface with partners that are completing technical designs and outlines best management practices that can be utilized to avoid or minimize potential adverse impacts.	-



Agency	Title	Type	Link	Summary	Year
USACE/ BOEM	USACE Sand Availability and Needs Determination (SAND)	Report and Tool	<a href="https://www.arcgis.com/apps/webappviewer/index.html?id=778a41a31f614aba9f3702bbd30f9229">https://www.arcgis.com/apps/webappviewer/index.html?id=778a41a31f614aba9f3702bbd30f9229</a>	Tool that quantifies sand needs and available sand resources for current Southeast beach nourishment projects for the next 50 years and accompanying report.	-
BSEE	Outer Continental Shelf (OCS) Facility Infrastructure, Gulf of Mexico	Tool	<a href="https://bobson.maps.arcgis.com/apps/dashboards/400bba386d3d4ec58396dbaa559c422c">https://bobson.maps.arcgis.com/apps/dashboards/400bba386d3d4ec58396dbaa559c422c</a>	An interactive dashboard that displays offshore energy infrastructure and its decommissioning-ready status relative to sand sediment areas, OCS blocks with significant sediment resources, and artificial reef permit and planning areas. The tool informs ecosystem service opportunities during decommissioning planning.	2021
<b>Nature-Based Coral and Oyster Reef Resources</b>					
EPA/ NOAA	Green Infrastructure for Coral Conservation	Fact Sheet	<a href="https://www.coris.noaa.gov/activities/projects/watershed/private_green_infrastructure.pdf">https://www.coris.noaa.gov/activities/projects/watershed/private_green_infrastructure.pdf</a>	Fact sheet outlining at a high level the importance of utilizing green infrastructure to protect corals, actions to be taken on individual properties and resources to learn more, produced by EPA and NOAA Coral Reef Conservation Program.	2021
NOAA	Oyster Habitat Restoration Monitoring and Assessment Handbook	Monitoring & Evaluation Guidance	<a href="http://www.oyster-restoration.org/wp-content/uploads/2014/01/Oyster-Habitat-Restoration-Monitoring-and-Assessment-Handbook.pdf">http://www.oyster-restoration.org/wp-content/uploads/2014/01/Oyster-Habitat-Restoration-Monitoring-and-Assessment-Handbook.pdf</a>	Handbook on oyster habitat restoration monitoring and assessment from NOAA, including universal monitoring metrics, variables, ancillary monitoring consideration, and metrics for success.	2014



Agency	Title	Type	Link	Summary	Year
NOAA	Coral Reef Restoration Monitoring Guide: Methods to Evaluate Restoration Success from Local to Ecosystem Scales	Monitoring Guidance	<a href="https://repository.library.noaa.gov/view/noaa/27135">https://repository.library.noaa.gov/view/noaa/27135</a>	Technical memo guidance for coral reef restoration and monitoring, including methodologies to measure success of restoration effort.	2020
USGS	A Geological Perspective on the Degradation and Conservation of Western Atlantic Coral Reefs	Implementation Guidance	<a href="https://pubmed.ncbi.nlm.nih.gov/27029403/">https://pubmed.ncbi.nlm.nih.gov/27029403/</a>	Peer reviewed USGS article on the geological degradation and conservation of coral reefs.	2016
USGS	A Framework for Identifying and Characterizing Coral Reef “Oases” against a Backdrop of Degradation	Monitoring Guidance	<a href="https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/1365-2664.13179">https://besjournals.onlinelibrary.wiley.com/doi/abs/10.1111/1365-2664.13179</a>	Framework from USGS for coral reef managers to identify and manage coral "oases" among degraded corals.	2018
USGS	Rigorously Valuing the Potential Coastal Hazard Risk Reduction Provided by Coral Reef Restoration in Florida and Puerto Rico	Report	<a href="https://pubs.er.usgs.gov/publication/ofr20211054">https://pubs.er.usgs.gov/publication/ofr20211054</a>	Report from USGS that aims to value the Potential Coastal Hazard Risk Reduction Provided by Coral Reef Restoration in Florida and Puerto Rico.	2021
USGS	The Role of U.S. Coral Reefs in Coastal Protection	Training and Learning Resources	<a href="https://wim.usgs.gov/geonarrative/cch-reefprot/">https://wim.usgs.gov/geonarrative/cch-reefprot/</a>	Story map highlighting the protection coral reef systems give to coastal communities.	-





Agency	Title	Type	Link	Summary	Year
USFWS	Gandys Beach Oyster Castle Shoreline Protection	Case Study	<a href="https://www.fws.gov/story/2022-08/shell-terring-our-shores-sea-level-rise">https://www.fws.gov/story/2022-08/shell-terring-our-shores-sea-level-rise</a>	The U.S. Fish and Wildlife Service, in partnership with The Nature Conservancy, used nature-based features like oyster castles, coir logs, shell and vegetation along Gandy's Beach Preserve, New Jersey, to protect and enhance Delaware Bay salt marsh and beach habitat severely damaged by Hurricane Sandy.	2016-2023
<b>Nature-Based Living Shoreline and Dune Resources</b>					
NOAA	Guidance for Considering the Use of Living Shorelines	Implementation Guidance	<a href="https://www.habitatblueprint.noaa.gov/wp-content/uploads/2018/01/NOAA-Guidance-for-Considering-the-Use-of-Living-Shorelines_2015.pdf">https://www.habitatblueprint.noaa.gov/wp-content/uploads/2018/01/NOAA-Guidance-for-Considering-the-Use-of-Living-Shorelines_2015.pdf</a>	Guidance for considering the use of living shorelines, including policy considerations and what types of support NOAA provides for living shorelines.	2015
NOAA	Working with Nature: A Guide to Native Plants for New York's Great Lakes Shorelines	Implementation Guidance	<a href="https://seagrant.sunysb.edu/Images/Uploads/PDFs/GreatLakes-ShorelinePlantsGuide.pdf">https://seagrant.sunysb.edu/Images/Uploads/PDFs/GreatLakes-ShorelinePlantsGuide.pdf</a>	Guide for utilizing native plants on NY's great lake shorelines, including integrating them into nature-based solution projects, produced by NY Sea Grant.	-
NOAA	NOAA Living Shorelines Project Map	Map	<a href="https://www.habitatblueprint.noaa.gov/story/map/lis/index.html">https://www.habitatblueprint.noaa.gov/story/map/lis/index.html</a>	Story map outlining NOAA's Living shoreline projects across the US.	2020
USDA	Plant Materials Technical Note: Coastal Shoreline and Dune Restoration	Implementation Guidance	<a href="https://efotg.sc.egov.usda.gov/references/public/TX/stpmc11tnCoastal.pdf">https://efotg.sc.egov.usda.gov/references/public/TX/stpmc11tnCoastal.pdf</a>	Technical report on coastal shoreline and dune restoration, featuring technique guidance and vegetation guidance, produced by USDA NRCS.	2011



Agency	Title	Type	Link	Summary	Year
USDA	Recommended Florida Native Beach and Dune Plants for Beachfront Properties and Dune Restoration	Implementation Guidance	<a href="https://floridadep.gov/rcp/coastal-construction-control-line/documents/recommended-florida-native-beach-and-dune-plants">https://floridadep.gov/rcp/coastal-construction-control-line/documents/recommended-florida-native-beach-and-dune-plants</a>	Technical report on the utilization of native plants for coastal and dune restoration in Florida, produced by USDA NRCS.	2007
USDA	Plants for Coastal and Shoreline Protection and Restoration	Implementation Guidance	<a href="https://www.nrcs.usda.gov/plant-materials/news/plant-materials-center-resources-for-coastal-restoration-efforts">https://www.nrcs.usda.gov/plant-materials/news/plant-materials-center-resources-for-coastal-restoration-efforts</a>	Website featuring multiple regional and locally specific technical resources and information on plants useful for coastal stabilization.	-
DOI	Case Study: Cost-Effectiveness of Reducing Coastal Erosion through Living Shorelines in the Hurricane Sandy Coastal Resilience Program	Case Study	<a href="https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-living-shoreline-case-study.pdf">https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-living-shoreline-case-study.pdf</a>	This case study forms part of a larger 2019 evaluation of the Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program) of the U.S. Department of the Interior (DOI) and the National Fish and Wildlife Foundation (NFWF). It provides an in-depth analysis of the program's living shorelines, with a particular emphasis on understanding their cost-effectiveness as compared to a traditional gray infrastructure approach (i.e., a stone revetment) to reduce coastal erosion.	2019



Agency	Title	Type	Link	Summary	Year
DOI	Case Study: Restoring Beaches and Dunes through the Hurricane Sandy Coastal Resilience Program	Case Study	<a href="https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-beach-dune-restoration-case-study.pdf">https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-beach-dune-restoration-case-study.pdf</a>	This case study forms part of a larger 2019 evaluation of the Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program) of the U.S. Department of the Interior (DOI) and the National Fish and Wildlife Foundation (NFWF). It provides an analysis of the ecological and community benefits of beach and dune restoration projects.	2019
<b>Nature-Based Solutions in Wetlands and Estuaries</b>					
NOAA	Planning for Sea Level Rise in the Northeast: Considerations for the Implementation of Tidal Wetlands Habitat Restoration Projects	Implementation Guidance	<a href="https://repository.library.noaa.gov/view/noaa/4016">https://repository.library.noaa.gov/view/noaa/4016</a>	Guide for understanding sea level rise impacts on tidal wetlands and for incorporating sea level rise into tidal wetland habitat restoration projects in the Northeast.	2011
NOAA	Sea Level Rise Viewer: Marsh Migration	Tool	<a href="https://coast.noaa.gov/digitalcoast/training/marshmigration.html">https://coast.noaa.gov/digitalcoast/training/marshmigration.html</a>	Interactive tool from NOAA that helps planners see where marshes may migrate due to sea level rise and where you can conserve inland areas to help facilitate migration.	-
NOAA/ USGS/ USFWS	Federal Interagency Nature-like Fishway Passage Design Guidelines for Atlantic Coast Diadromous Fishes	Implementation Guidance	<a href="https://repository.library.noaa.gov/view/noaa/28919">https://repository.library.noaa.gov/view/noaa/28919</a>	Technical memo on Federal Interagency Nature-like Fishway Passage Design Guidelines for Atlantic Coast Diadromous Fishes, produced by NOAA, USGS and USFWS.	2016



Agency	Title	Type	Link	Summary	Year
USDA	Climate Adaptation Tools for Wetland Conservation and Management	Implementation Guidance	<a href="https://www.climatehubs.usda.gov/hubs/northern-forests/topic/climate-adaptation-tools-wetland-conservation-and-management">https://www.climatehubs.usda.gov/hubs/northern-forests/topic/climate-adaptation-tools-wetland-conservation-and-management</a>	Website featuring USDA Climate Adaptation Tools for Wetland Conservation and Management.	-
USFWS	Salt Marsh Sediment Augmentation to Combat Sea-Level Rise	Implementation Guidance	<a href="https://www.fws.gov/story/salt-marsh-sediment-augmentation-project">https://www.fws.gov/story/salt-marsh-sediment-augmentation-project</a>	Website on a USFWS salt marsh sediment augmentation project in Seal Beach, CA, with resources on related trainings.	2019
USFWS	Great Dismal Swamp Peatland Restoration	Case Study	<a href="https://pubs.er.usgs.gov/publication/70180205">https://pubs.er.usgs.gov/publication/70180205</a>  <a href="https://storymaps.arcgis.com/stories/47994f3bf56b49c4ad5065813aa82595">https://storymaps.arcgis.com/stories/47994f3bf56b49c4ad5065813aa82595</a>	Implement hydrologic restoration of drained forested peatland. Implementation strategy requires slowing drainage in legacy drainage ditches to raise water table and re-wet peat soils. Hydrologic restoration follows approaches applied in drained peatlands around the world and has been shown to be effective. Outcome of re-wetting peat soils is reducing risk of severe ground fire, reducing magnitude of storm runoff, restoring hydrologic conditions that favor native forest habitat, and increasing carbon sequestration. Work has been progressing actively since 2012 and includes 4 separate projects across 66,000 acres of the Great Dismal Swamp NWR and Dismal Swamp State Park.	2012-2022



Agency	Title	Type	Link	Summary	Year
USFWS	Prime Hook National Wildlife Refuge Ecosystem Restoration	Case Study	<a href="https://usfwsnortheast.wordpress.com/2017/04/24/at-prime-hook-national-wildlife-refuge-mother-knows-best/">https://usfwsnortheast.wordpress.com/2017/04/24/at-prime-hook-national-wildlife-refuge-mother-knows-best/</a>	Restore the degraded coastal systems of the Refuge, which included failing freshwater impoundments resulting from sea-level rise and anthropogenic alternations, back to a naturally functioning coastal ecosystem.	2016
USGCRP	Second State of the Carbon Cycle Report, Chapter 15 Tidal Wetlands and Estuaries	Whitepaper	<a href="https://carbon2018.globalchange.gov/chapter/15/">https://carbon2018.globalchange.gov/chapter/15/</a>	Coastal chapter within USGCRP report on the state-of-the-science assessment of the carbon cycle in North America and its connection to climate and society.	2018
USGS	Restoring Tides to Reduce Methane Emissions in Impounded Wetlands: A New and Potent Blue Carbon Climate Change Intervention	Report	<a href="https://www.nature.com/articles/s41598-017-12138-4">https://www.nature.com/articles/s41598-017-12138-4</a>	Paper on restoring tides to reduce methane emissions in impounded wetlands from USGS: A New and Potent Blue Carbon Climate Change Intervention.	2017
USGS	Evaluating Tidal Saline Wetland Migration along the U.S. Gulf of Mexico	Broader Resource	<a href="https://pubs.er.usgs.gov/publication/ds969">https://pubs.er.usgs.gov/publication/ds969</a>	Study from USGS and USFWS that quantifies the potential for landward migration of tidal saline wetlands along the U.S. Gulf of Mexico coast under alternative future sea-level rise and urbanization scenarios.	2015
EPA	The National Estuary Program: At the Forefront of Climate Change Adaptation,	Reference	<a href="https://www.epa.gov/nep/national-estuary-program-forefront-climate-change-adaptation-">https://www.epa.gov/nep/national-estuary-program-forefront-climate-change-adaptation-</a>	Describes the NEP's efforts to address climate change impacts in their watersheds, working in partnership with federal, state, and local entities. The NEPs implement a	2021



Agency	Title	Type	Link	Summary	Year
	Hazard Mitigation, and Resilience		<a href="#">hazard-mitigation-and-resilience</a>	wide-ranging portfolio of climate adaptation, hazard mitigation, and resiliency projects organized into six categories for this paper: 1) Assessment and Planning, 2) Restoration, 3) Water Infrastructure/Green Infrastructure/Stormwater/Nonpoint Sources, 4) Monitoring and Research, 5) Outreach, and 6) Environmental Justice/Equity. The document specifically focuses on more than 145 NEP projects from 2016-2020.	
DOI	Case Study: Improving Marsh Resilience through the Hurricane Sandy Coastal Resilience Program	Case Study	<a href="https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-marsh-restoration-case-study.pdf">https://live-nfwf-2019.pantheonsite.io/sites/default/files/hurricanesandy/Documents/hurricane-sandy-marsh-restoration-case-study.pdf</a>	This case study forms part of a larger 2019 evaluation of the Hurricane Sandy Coastal Resilience Program (Hurricane Sandy Program) of the U.S. Department of the Interior (DOI) and the National Fish and Wildlife Foundation (NFWF). It provides an analysis of the ecological resilience benefits of marsh restoration projects.	2019

### Select Nature-Based Solutions Resources from Non-Federal Entities

Cities of Service/AmeriCorps	What Does Effective Engagement Look Like? Lessons from Resilience AmeriCorps	Report	<a href="https://citiesofservice.jhu.edu/resilience-ameri-corps-2/what-does-effective-engagement-look-like-lessons-from-resilience-ameri-corps/">https://citiesofservice.jhu.edu/resilience-ameri-corps-2/what-does-effective-engagement-look-like-lessons-from-resilience-ameri-corps/</a>	Document with lessons learned about partnerships and strategies to build community resilience, produced by Cities of Service and AmeriCorps.	-
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Agency	Title	Type	Link	Summary	Year
ELI	Nature-Based Mitigation Goals and Actions in Local Mitigation Plans	Study	<a href="https://www.eli.org/research-report/nature-based-mitigation-goals-and-actions-local-mitigation-plans">https://www.eli.org/research-report/nature-based-mitigation-goals-and-actions-local-mitigation-plans</a>	Study from ELI with results on a snapshot of nature-based practices that local governments may consider including in subsequent mitigation plan updates.	2021
ELI	Nature-Based Mitigation Goals and Actions in State and Tribal Hazard Mitigation Plans	Study	<a href="https://www.eli.org/research-report/nature-based-mitigation-goals-and-actions-state-and-tribal-hazard-mitigation-plans">https://www.eli.org/research-report/nature-based-mitigation-goals-and-actions-state-and-tribal-hazard-mitigation-plans</a>	Study from ELI with results on a suite of nature-based practices and model examples that can be used by states/tribes in mitigation plan updates.	2021
NRC	Using Nature to Address Flooding	Case Studies	<a href="http://nrcsolutions.org/">http://nrcsolutions.org/</a>	Guide of nature-based solutions and included case studies of successful projects from across the country to help communities learn more and identify which nature-based solutions might work for them.	-
NFWF	Coastal Resilience Evaluation and Siting Tool (CREST)	Tool	<a href="https://resilientcoasts.org/#Home">https://resilientcoasts.org/#Home</a>	Tool and guidance for coastal siting with regionally specific guidance.	-
NFWF	Third-Party Evaluations of NFWF Conservation Programs	Case Studies & Evaluations	<a href="https://www.nfwf.org/strategies-results/evaluating-our-results/third-party-evaluations">https://www.nfwf.org/strategies-results/evaluating-our-results/third-party-evaluations</a>	This collection of third-party evaluations includes projects that utilize NBS and provides examples of assessment that capture broader socioeconomic and ecological benefits.	-



Agency	Title	Type	Link	Summary	Year
NWF and CSO	Softening Our Shorelines: Policy and Practice for Living Shorelines Along the Gulf and Atlantic Coasts	Implementation guidance	<a href="http://nwf.org/softening-shorelines/">http://nwf.org/softening-shorelines/</a>	Guidance on policy and practice for implementing softened or natural shorelines across the US, produced by CSO and NWF.	-
NWF	Building Resilience through Natural Infrastructure	Whitepaper	<a href="https://www.nwf.org/-/media/Documents/PDFs/Press-Releases/2021/07-29-21_Building-Resilience-through-Natural-Infrastructure">https://www.nwf.org/-/media/Documents/PDFs/Press-Releases/2021/07-29-21_Building-Resilience-through-Natural-Infrastructure</a>	An analysis of avenues and opportunities available to advance the use of nature-based solutions in FEMA and HUD programs.	2021
NWF	Incorporating Nature-based Solutions in Community Climate Adaptation Planning	Implementation Guidance	<a href="https://library.oarcloud.noaa.gov/noaa_documents.lib/OAR/CPO/Climate_Smart_Communities/Vol_05_CSC_Nature-basedSolutions.pdf">https://library.oarcloud.noaa.gov/noaa_documents.lib/OAR/CPO/Climate_Smart_Communities/Vol_05_CSC_Nature-basedSolutions.pdf</a>	Guidance on how to explore hazards, assess vulnerability and risk, investigate options, prioritize and plan, and take action on implementing nature-based solutions.	2022
RAE	Coastal Restoration Toolkit	Toolkit	<a href="https://restoreyourcoast.org/">https://restoreyourcoast.org/</a>	RAE Toolkit on coastal restoration to help start a restoration project guided by problem aiming to address like flooding, coastal erosion, water quality, invasive species, or wildlife habitat loss.	-





Agency	Title	Type	Link	Summary	Year
TNC	Promoting Nature-Based Hazard Mitigation Through FEMA Mitigation Grants	Funding Guidance	<a href="https://www.nature.org/content/dam/tnc/nature/en/documents/Promoting-Nature-Based-Hazard-Mitigation-Through-FEMA-Mitigation-Grants-05-10-2021-LR.pdf">https://www.nature.org/content/dam/tnc/nature/en/documents/Promoting-Nature-Based-Hazard-Mitigation-Through-FEMA-Mitigation-Grants-05-10-2021-LR.pdf</a>	Guidance document is intended for stakeholders pursuing FEMA HMA grants for nature-based solutions to mitigate risks associated with flooding (riverine and coastal) and wildfire.	2021
BBVA	Recipes for a Flourishing Arctic	Report	<a href="https://osf.io/rk5h2/download">https://osf.io/rk5h2/download</a>	Publication from BBVA Foundation on natural-based solutions applied to the Arctic's governance, economy, legislation, and resource management.	2021



# Federal Funding Programs for Nature-Based Solutions

The following federal programs are potential sources of support for coastal communities, States, Tribes, and Territories seeking to implement nature-based solutions. The programs encompass grant opportunities, loans, planning, design, construction and/or technical assistance.

Many existing programs now have an expanded opportunity to fund projects as a result of the Bipartisan Infrastructure Law's historic investment in the resiliency of our infrastructure to climate change, cybersecurity risks, and other hazards:

<https://www.whitehouse.gov/build/>

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The EPA-led Green Infrastructure Federal Collaborative fosters engagement and cooperation between agencies that actively work to promote the implementation of green infrastructure. On November 2, 2021, members of the Green Infrastructure Federal Collaborative discussed funding and technical assistance opportunities that advance the implementation of green infrastructure and nature-based solutions. Attendees learned how federal programs are helping build vibrant and resilient communities with programs that support the design,

construction, and maintenance of green infrastructure. Breakout sessions hosted by Collaborative members provided attendees with the opportunity to pose questions and interact directly with relevant federal agencies. View the recording here: <https://youtu.be/nQCTK2jhckU>

Collaborative members developed the initial version of this funding list. They are working closely to align knowledge and resources to build capacity for green infrastructure implementation. To view more details, you can download the slides to the presentation:

[https://www.epa.gov/system/files/documents/2021-11/navigating-federal-funding\\_green-infrastructure\\_508.pdf](https://www.epa.gov/system/files/documents/2021-11/navigating-federal-funding_green-infrastructure_508.pdf)

Additional funding opportunities for green infrastructure projects may be accessed here:

<https://www.epa.gov/green-infrastructure/green-infrastructure-funding-opportunities>

These coordinated federal efforts provide a platform to publicize the multiple environmental, economic, and social benefits of green infrastructure. In addition, the Collaborative seeks to facilitate strategies that foster climate resilience and encourage the equitable implementation of green infrastructure in all communities.



Agency	Program	Link	Bipartisan Infrastructure Law Supplemental Funding
	A Guidebook to the Bipartisan Infrastructure Law for State, local, Tribal, and Territorial Governments, and Other Partners	<a href="https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf#page=151">https://www.whitehouse.gov/wp-content/uploads/2022/05/BUILDING-A-BETTER-AMERICA-V2.pdf#page=151</a>	
BIA	Tribal Climate Resilience Program	<a href="https://www.bia.gov/bia/ots/tribal-climate-resilience-program">https://www.bia.gov/bia/ots/tribal-climate-resilience-program</a> <a href="https://www.bia.gov/sites/default/files/dup/inline-files/fy22_tribal_climate_resilience_rfp_508_1.pdf">https://www.bia.gov/sites/default/files/dup/inline-files/fy22_tribal_climate_resilience_rfp_508_1.pdf</a>	\$20.1 million / 5 years
EDA	Public Works and Economic Adjustment Assistance Funds	<a href="https://www.eda.gov/funding-opportunities/">https://www.eda.gov/funding-opportunities/</a>	-
EDA	American Rescue Plan Program: Economic Adjustment Assistance Funds	<a href="https://eda.gov/arpa/economic-adjustment-assistance/">https://eda.gov/arpa/economic-adjustment-assistance/</a>	-
EPA	Overflow and Stormwater Grants (OSG)	<a href="http://www.epa.gov/cwsrf/sewer-overflow-and-storm-water-reuse-municipal-grants-program">http://www.epa.gov/cwsrf/sewer-overflow-and-storm-water-reuse-municipal-grants-program</a>	-
EPA	Clean Water State Revolving Fund (CWSRF)	<a href="http://www.epa.gov/cwsrf">http://www.epa.gov/cwsrf</a>	\$12.7 billion until expended
EPA	Water Infrastructure Finance and Innovation Act (WIFIA) <sup>2</sup>	<a href="http://www.epa.gov/wifia">http://www.epa.gov/wifia</a>	-
EPA	Section 319 Non-Point Source Grants	<a href="https://www.epa.gov/nps">https://www.epa.gov/nps</a>	-
EPA	Environmental Justice Small Grants	<a href="https://epa.maps.arcgis.com/apps/Cascade/index.html?appid=d426d553c4cc44a3af62bff7e175108e">https://epa.maps.arcgis.com/apps/Cascade/index.html?appid=d426d553c4cc44a3af62bff7e175108e</a>	-
EPA	Great Lakes Restoration Initiative (EPA)	<a href="https://glri.us/funding#grant-opps%C3%A2%E2%82%AC%E2%80%B9">https://glri.us/funding#grant-opps%C3%A2%E2%82%AC%E2%80%B9</a>	\$1 billion until expended



EPA	Green Streets, Green Jobs, Green Towns (G3)	<a href="https://www.epa.gov/G3/green-streets-green-jobs-green-towns-g3-grant-program">https://www.epa.gov/G3/green-streets-green-jobs-green-towns-g3-grant-program</a>	-
EPA	Drinking Water State Revolving Fund	<a href="https://www.epa.gov/dwsrf">https://www.epa.gov/dwsrf</a>	\$30.7 billion until expended
EPA	Brownfields Grant Program	<a href="https://www.epa.gov/brownfields/overview-epas-brownfields-program">https://www.epa.gov/brownfields/overview-epas-brownfields-program</a>	\$1.5 billion until expended
EPA	Superfund Redevelopment Program	<a href="https://www.epa.gov/superfund-redevelopment">https://www.epa.gov/superfund-redevelopment</a>	\$3.5 billion until expended
EPA	Five Star and Urban Waters Restoration Grant Program	<a href="https://www.epa.gov/urbanwaterspartners/five-star-and-urban-waters-restoration-grant-program">https://www.epa.gov/urbanwaterspartners/five-star-and-urban-waters-restoration-grant-program</a>	-
EPA	Urban Waters Small Grants Program	<a href="https://www.epa.gov/urbanwaters/urban-waters-small-grants">https://www.epa.gov/urbanwaters/urban-waters-small-grants</a>	-
EPA	Office of Sustainable Communities Greening America's Communities Program – Technical Assistance	<a href="https://www.epa.gov/smartgrowth/greening-americas-communities">https://www.epa.gov/smartgrowth/greening-americas-communities</a>	-
EPA	National Estuary Program	<a href="https://www.epa.gov/nep">https://www.epa.gov/nep</a>	\$132 million / 5 years
EPA	Geographic Programs	<a href="https://www.epa.gov/infrastructure/fact-sheet-epa-bipartisan-infrastructure-law">https://www.epa.gov/infrastructure/fact-sheet-epa-bipartisan-infrastructure-law</a>	\$1.71 billion / 5 years
FEMA	Building Resilient Infrastructure & Communities (BRIC)	<a href="https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities">https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities</a>	\$1 billion until expended
FEMA	Dam Safety	<a href="https://www.fema.gov/emergency-managers/risk-management/dam-safety">https://www.fema.gov/emergency-managers/risk-management/dam-safety</a>	\$733 million (could be used for NBS)
FEMA	Flood Mitigation Assistance (FMA) Grant Program	<a href="https://www.fema.gov/flood-mitigation-assistance-grant-program">https://www.fema.gov/flood-mitigation-assistance-grant-program</a>	\$3.5 billion until expended
FEMA	Hazard Mitigation Grant Program (HMGP)	<a href="https://www.fema.gov/grants/mitigation/hazard-mitigation">https://www.fema.gov/grants/mitigation/hazard-mitigation</a>	-
FEMA	Public Assistance Mitigation Funding (available as part of the Public Assistance Grant Program)	<a href="https://www.fema.gov/sites/default/files/2020-06/fema-pa406-mitigation-brochure.pdf">https://www.fema.gov/sites/default/files/2020-06/fema-pa406-mitigation-brochure.pdf</a>	-



FEMA	Safeguarding Tomorrow Revolving Loan Fund	<a href="https://www.fema.gov/grants/mitigation/storm-rlf">https://www.fema.gov/grants/mitigation/storm-rlf</a>	\$500 million until expended
HUD	Community Development Block Grant (CDBG)	<a href="https://www.hudexchange.info/programs/cdbg/">https://www.hudexchange.info/programs/cdbg/</a>	-
HUD	CDBG Section 108	<a href="https://www.hudexchange.info/programs/section-108/">https://www.hudexchange.info/programs/section-108/</a>	-
HUD	CDBG-DR	<a href="https://www.hudexchange.info/programs/cdbg-dr/">https://www.hudexchange.info/programs/cdbg-dr/</a>	-
NOAA	National Estuarine Research Reserve System	<a href="https://coast.noaa.gov/funding/archive.html">https://coast.noaa.gov/funding/archive.html</a>	\$77 million / 5 years
NOAA	Community Based Restoration Program Grants	<a href="https://www.fisheries.noaa.gov/grant/coastal-and-marine-habitat-restoration-grants">https://www.fisheries.noaa.gov/grant/coastal-and-marine-habitat-restoration-grants</a>	\$491 million / 5 years
NOAA	National Coastal Zone Management Program	<a href="https://coast.noaa.gov/czm/about/">https://coast.noaa.gov/czm/about/</a>	\$207 million / 5 years
NOAA	National Coastal Resilience Fund	<a href="https://www.nfwf.org/programs/national-coastal-resilience-fund?activeTab=tab-1">https://www.nfwf.org/programs/national-coastal-resilience-fund?activeTab=tab-1</a>	\$492 million / 5 years
USACE	Floodplain Management Services Program - Technical Assistance	<a href="https://www.nab.usace.army.mil/technical-services/">https://www.nab.usace.army.mil/technical-services/</a>	-
USACE	Planning Assistance to States (PAS)	<a href="https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/templates_pas/">https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/templates_pas/</a>	\$30 million until expended
USACE	Project Partnership Agreements (PPA)	<a href="https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/">https://www.usace.army.mil/Missions/Civil-Works/Project-Partnership-Agreements/</a>	-
USACE	Individually Authorized Feasibility Studies and Projects	<a href="https://planning.erdc.dren.mil/toolbox/project.cfm?Step=2">https://planning.erdc.dren.mil/toolbox/project.cfm?Step=2</a>	-
USACE	Continuing Authorities Program (CAP) – including Small Flood Risk Management Projects, Beneficial Use of Dredged Material, Modification of Projects for the Environment	<a href="https://planning.erdc.dren.mil/toolbox/processes.cfm?Id=229&amp;Option=Continuing%20Authorities%20Program%20(CAP)">https://planning.erdc.dren.mil/toolbox/processes.cfm?Id=229&amp;Option=Continuing Authorities Program (CAP).</a>	\$465 million until expended
USACE	Tribal Partnership Program (TPP)	<a href="http://www.usace.army.mil/Missions/Civil-Works/Tribal-Nations/tribal_otherpolicies/">http://www.usace.army.mil/Missions/Civil-Works/Tribal-Nations/tribal_otherpolicies/</a>	-
USACE	Watershed Studies (Sec 729)	<a href="http://www.usace.army.mil/Missions/Civil-Works/Project-Planning/WRRDA-7001-Proposals/">http://www.usace.army.mil/Missions/Civil-Works/Project-Planning/WRRDA-7001-Proposals/</a>	-



USDA	Regional Conservation Partnership Program	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/rcpp/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/rcpp/</a>	-
USDA	Conservation Innovation Grants	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/cig/</a>	-
USDA	Environmental Quality Incentives Program	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/</a>	-
USDA	Agricultural Conservation Easement Program (inc. Wetland Reserve Easements)	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/acep/</a>	-
USDA	Conservation Stewardship Program	<a href="https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/">https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/csp/</a>	-
USDA	National Water Quality Initiative	<a href="https://www.nrcs.usda.gov/programs-initiatives/national-water-quality-initiative">https://www.nrcs.usda.gov/programs-initiatives/national-water-quality-initiative</a>	-
USDA	Conservation Reserve Program	<a href="https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index">https://www.fsa.usda.gov/programs-and-services/conservation-programs/conservation-reserve-program/index</a>	-
USDA	Farmable Wetland Program	<a href="https://www.fsa.usda.gov/programs-and-services/conservation-programs/farmable-wetlands/index">https://www.fsa.usda.gov/programs-and-services/conservation-programs/farmable-wetlands/index</a>	-
USDA	NRCS Healthy Forests Reserve Program	<a href="https://www.nrcs.usda.gov/programs-initiatives/hfrp-healthy-forest-reserve-program">https://www.nrcs.usda.gov/programs-initiatives/hfrp-healthy-forest-reserve-program</a>	-
USDA NRCS	Watershed and Flood Prevention Operations Program	<a href="https://www.nrcs.usda.gov/programs-initiatives/watershed-and-flood-prevention-operations-wfpo-program">https://www.nrcs.usda.gov/programs-initiatives/watershed-and-flood-prevention-operations-wfpo-program</a>	\$500 million until expended
USDA NRCS	Watershed Rehabilitation Program	<a href="https://www.nrcs.usda.gov/programs-initiatives/watershed-rehabilitation">https://www.nrcs.usda.gov/programs-initiatives/watershed-rehabilitation</a>	\$118 million until expended
DOD	Readiness and Environmental Protection Integration (REPI) Program	<a href="https://www.repi.mil/">https://www.repi.mil/</a>	-
DOT	FHWA Surface Transportation Block Grants	<a href="https://www.fhwa.dot.gov/specialfunding/stp/">https://www.fhwa.dot.gov/specialfunding/stp/</a>	\$72 billion / 4 years
DOT	Promoting Resilient Operations for Transformative, Efficient, and	<a href="https://www.transportation.gov/grants">https://www.transportation.gov/grants</a>	\$8.7 billion / 4 years



	Cost-Saving Transportation (PROTECT) Grants and Formula Funding		
DOI	National Revegetation Effort Including National Seed Strategy	<a href="https://www.blm.gov/programs/natural-resources/native-plant-communities/national-seed-strategy">https://www.blm.gov/programs/natural-resources/native-plant-communities/national-seed-strategy</a>	\$70 million / 5 years
DOI	America the Beautiful Challenge	<a href="https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf">https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf</a>	\$393.5 million / 5 years
DOI OS	BIL Section 40804 Ecosystem Restoration	<a href="https://www.whitehouse.gov/ceq/news-updates/2022/04/11/biden-harris-administration-launches-1-billion-america-the-beautiful-challenge-to-support-and-accelerate-locally-led-conservation-and-restoration-projects/">https://www.whitehouse.gov/ceq/news-updates/2022/04/11/biden-harris-administration-launches-1-billion-america-the-beautiful-challenge-to-support-and-accelerate-locally-led-conservation-and-restoration-projects/</a>	\$375 million / 5 years (Activity 4) as part of NFWF challenge
DOI Office of Insular Affairs	Coral Reef and Natural Resources Initiative	<a href="https://www.doi.gov/oia/coral-reef-and-natural-resources-initiative">https://www.doi.gov/oia/coral-reef-and-natural-resources-initiative</a>	\$2.5 million / year
DOI-FWS	BIL ERWG Activity 4, 6, 7, 8, 9 funds, FY 2022	<a href="https://www.doi.gov/priorities/investing-americas-infrastructure/ecosystem-restoration/projects">https://www.doi.gov/priorities/investing-americas-infrastructure/ecosystem-restoration/projects</a>	\$15,370,478
DOI-FWS	BIL Ecosystem Restoration Working Group Activity 1a funds, FY 2023	<a href="https://www.fws.gov/press-release/2022-02/bipartisan-infrastructure-law-funds-proven-projects-fish-and-wildlife">https://www.fws.gov/press-release/2022-02/bipartisan-infrastructure-law-funds-proven-projects-fish-and-wildlife</a>	\$3,697,965
DOI-FWS	Total FWS Inflation Reduction Act funds		\$121,250,000 / 4 years
DOI-FWS	Inflation Reduction Act funds: Albemarle-Pamlico Sound Restoration, NC		\$30 million / 4 years
DOI-FWS	Delaware River Basin Restoration Program	<a href="https://www.fws.gov/project/delaware-watershed-conservation-fund-projects-funded-bipartisan-infrastructure-law">https://www.fws.gov/project/delaware-watershed-conservation-fund-projects-funded-bipartisan-infrastructure-law</a>  <a href="https://www.fws.gov/program/delaware-river-basin-restoration">https://www.fws.gov/program/delaware-river-basin-restoration</a>	\$26 million / 5 years



DOI-FW S	National Fish Passage Program	<a href="https://www.fws.gov/program/national-fish-passage">https://www.fws.gov/program/national-fish-passage</a>	\$200 million / 5 years
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