



How Infrastructure Reform Can Prioritize Ocean Climate Action

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Introduction and summary

Now is the time to invest in the United States' coastal communities and ocean. Historically, the ocean has been central to the U.S. conception of infrastructure; early cities were built in naturally sheltered bays or on the banks of tidal rivers to provide safe harbors for ships.¹ Today, ocean-based climate solutions have the potential to provide up to one-fifth of the reductions in greenhouse gas (GHG) emissions needed globally to limit the world's temperature rise to 1.5 degrees Celsius, which scientists say is necessary in order to lower the risks associated with climate change.²

Since that time, sewage outflow from cities and towns; invasive species transported by ballast water; and pollution from industrial and military activities have permanently altered coastal ecosystems.³ Breakwaters, jetties, seawalls, and dredging became ubiquitous features of the American shoreline, facilitating trade, transportation, emergency response, and play. Moreover, the extreme weather and sea level rise linked to climate change will stress these delicate ecosystems even further, while also damaging the critical infrastructure that supports communities and the economy. Transportation, drinking water, and flood-control systems, among others, are all at risk.

The American Jobs Plan offers a once-in-a-century opportunity to create millions of new, well-paying union jobs, revitalize the nation's infrastructure, and build a clean energy future. President Joe Biden's vision includes \$2.3 trillion in direct federal spending and a suite of ambitious clean energy tax incentives that would add another \$400 billion.⁴ This would be the biggest jobs package since World War II, and if done right, it could dramatically shift the trajectory of global warming, putting the United States on the path to a 100 percent clean future by midcentury.

A comprehensive infrastructure package that fully incorporates ocean climate solutions would advance the Biden administration's desire to prioritize racial justice, inclusive economic recovery, and sustainable growth that achieves net-zero carbon emissions by midcentury.⁵ Such a package should:

- 1. Reduce emissions and enhance resilience:** With appropriate investments in conservation, restoration, and infrastructure, oceans have the potential to achieve one-fifth of the reductions in GHG emissions necessary to limit the world's temperature rise to 1.5 degrees Celsius.⁶ To achieve this necessary reduction, the bill should prioritize the restoration of coastal habitats that store carbon and benefit biodiversity and fisheries; create tens of thousands of jobs in coastal communities; and support natural infrastructure that protects coastal communities from rising sea levels and storms.⁷ Coastal investments will include a smart mix of natural, nature-based, and traditional infrastructure facilities.
- 2. Generate economic prosperity:** The U.S. ocean economy, or blue economy, accounted for more than \$129 billion in wages and \$304 billion in goods and services in 2016—the most recent year for which data are available.⁸ In 2018, marine cargo alone accounted for \$5.4 trillion in U.S. economic activity, which is 26 percent of the nation's gross domestic product.⁹ Ocean climate infrastructure investments in offshore wind and nature-based solutions should secure the nation's long-term prosperity by paying fair wages, providing good benefits and a voice on the job, and offering American workers from all walks of life a pathway to the middle class.¹⁰
- 3. Advance inclusive and equitable development:** This same emphasis on growth and demand for ocean resources is already straining front-line communities—creating renewed opportunities for investment through offshore wind on the one hand and paving the way for dislocation on the other. Coastal infrastructure development and regulation must center communities historically overlooked in the federal infrastructure policy process and denied access to ocean and coastal resources.¹¹

This report proposes agency-by-agency infrastructure and transportation policies to directly improve ocean health and mitigate the impacts of further development on the ocean and coastal environment.

Reduce emissions and enhance resilience

The infrastructure investments in this section—cleaning up the maritime transportation system and ports, protecting the Arctic, and investing in coastal ecosystems—would directly reduce GHG emissions and enhance the ocean’s natural ability to store carbon. Taken together, these actions can mitigate future climate change and reduce the amount of carbon already present in the atmosphere as well as create jobs and protect coastal communities.

The marine transportation system

The ocean has absorbed more than 90 percent of the excess heat from climate change,¹² but transportation across its surface—on which global trade and many industries rely—is one of the largest contributors to global GHG emissions annually.¹³ Within the U.S. Department of Transportation (DOT), the Maritime Administration (MARAD)¹⁴ promotes the U.S. maritime industry, funds grants for ports, backs loans for ships, and trains the next generation of mariners to operate and maintain vessels. Vessels moved 42 percent of the value and 71 percent of the weight of U.S. international trade in 2018,¹⁵ and while they are by far the most efficient mode of cargo transportation,¹⁶ ships and their support infrastructure can have dramatic impacts on ocean ecosystem health through ocean pollution, ocean noise, GHG emissions, and marine mammal strikes.

The shipping industry’s size, operational flexibility, and access to capital creates numerous opportunities for major, near-term emission reductions.¹⁷ According to a study from the International Transport Forum (ITF),¹⁸ it may be possible to cut global shipping emissions by more than 90 percent below projected emissions by 2035 through a combination of ship design, operational efficiencies, and low-carbon fuels. This includes building ships with lightweight materials, more slender designs, and better propulsion; lowering operating speeds and reducing wait times at ports; and using advanced biofuels, methanol, ammonia, or hydrogen.

To improve climate mitigation in the maritime sector, Congress should take the following actions:

- Urge the Biden administration to encourage the International Maritime Organization to implement the recommendations of the ITF study and support the administration's goal of achieving net-zero emissions from international shipping by 2050.¹⁹
- Prioritize emission reductions and zero-emission vessels in federally backed loans under MARAD's Title XI loan program.²⁰
- Direct MARAD's Port Infrastructure Development Program to prioritize projects that reduce emissions, including support for shore power to reduce vessel emissions at berth, and improve port infrastructure resilience to natural hazards.
- Fully fund the Maritime Environment and Technology Assistance (META) program at \$10 million annually to research critical technologies such as low-emission vessels and reduced impacts to marine mammals.²¹
- Support mitigation in ports and intermodal facilities that most affect port-side communities, as modeled in Rep. Nanette Barragán's (D-CA) Climate Smart Ports Act.
- Establish a pier pass traffic mitigation fee as an incentive to shift some container movement to night hours in order to relieve traffic congestion, as truck idling during day hours causes significant air pollution in harborside communities; create additional criteria to fund electrification of rail and truck transport; advance freight transport efficiency; and improve neighborhood resiliency through the Port Infrastructure Development Program.

The Federal Maritime Commission (FMC), meanwhile, regulates international maritime commerce for the benefit of U.S. exporters, importers, and the U.S. consumer.²² It ensures U.S. fleet competition in international markets by tracking unfair or deceptive practices. In order to guarantee competitive and efficient ocean transportation, the FMC should ensure that U.S. carriers complying with International Maritime Organization emission-reduction and environmental standards are not undercut by foreign fleets that are out of compliance. Congress should also consider expanding the FMC's authorities to require carriers and marine terminal operators to provide information on their policies and practices related to emission-reduction and marine mammal regulations.²³ Moreover, it should fund additional investigative staff at the FMC to carry out this scope of work.

Protection of the Arctic and living marine resources

The U.S. Coast Guard (USCG), housed within the U.S. Department of Homeland Security (DHS), is the nation's maritime law enforcement agency.²⁴ The USCG is tasked with 11 statutory missions, including marine safety, law enforcement, and the protection of living marine resources. The breadth of the USCG's mission often leaves its resources stretched thin, so additional coordination and resources could improve its ability to protect living marine resources and enforce maritime regulations.

To help protect these resources, Congress should take the following actions:

- Direct the USCG and the National Oceanic and Atmospheric Administration (NOAA) to produce a joint strategy to address the impact of shifting stocks on the USCG's ability to execute its living marine resources mission. This strategy should also project the fleet allocation to different districts and plan for necessary training.
- Help the USCG protect Arctic resources by amending the Act to Prevent Pollution from Ships to limit the noise level of propulsion technologies capable of masking marine mammal communication,²⁵ restrict access to cruise vessels,²⁶ and require stringent grey water and ballast water management regulations developed specifically for Arctic ecosystems.²⁷
- Ban the use of heavy fuel oils and any emission of black carbon in the Arctic, while also considering the impacts of localized emissions on ice cover and regional community health in the Port Access Route Studies.²⁸
- Direct the USCG, in partnership with NOAA, to develop regulations that encourage the adoption of abandoned and discarded fishing gear, known as ghost gear, source reduction and at-sea waste minimization measures to the maximum extent practicable.

In the most recent National Defense Authorization Act (NDAA), the USCG was authorized to report, plan, and implement a program to mitigate the impacts of vessel noise on the Southern Resident orca pod, without appropriated funds.²⁹ The USCG is required to make recommendations for appropriations by June 30, 2021, and in order to best protect endangered marine mammals, congressional appropriations should meet or exceed the USCG's request in the fiscal year 2022 NDAA. If funded and given a chance to be successful, this program could act as a model for vessel noise mitigation in other regional endangered marine mammal territories in the U.S. exclusive economic zone.

Coastal infrastructure

For more than 100 years, the Army Corps of Engineers has altered coastal environments with immense consequences for marine ecosystems.³⁰ However, the corps also has daily opportunities to sequester carbon and improve habitat while also protecting communities. Infrastructure resilience, achieved through ecologically consistent, low-emission, and nature-based design at the watershed scale, must be the new standard for corps projects.

Congress already recognizes the value of Army Corps of Engineers investments in green infrastructure. For example, the 2020 Water Resources Development Act requires the corps to include more consideration of environmental and social goals in their project assessments; limits state and local expenses for natural and nature-based project features; and works to limit the spread of invasive species.

However, the corps remains far more invested in ecosystem alteration than in ecosystem restoration and resilience.³¹ To address this, Congress should require corps design standards to enhance, rather than disrupt, ecosystem health in all projects. The corps' *Engineering With Nature: An Atlas* has documented dozens of examples of corps pilot projects that “leverage natural systems and processes through integrated water resources management ... [to] develop more sustainable solutions and systems,” from using oyster reefs for shoreline stabilization to adjusting lock and dam outflow to more closely resemble natural riverine flow.³²

To support the corps in restoring coastal environments, Congress should take the following actions:

- Direct the corps to prioritize consistent water exchange, microhabitat production, and ecosystem-specific guidance with the help of the Engineering With Nature program across the agency.³³
- Double funding for interdisciplinary Silver Jacket teams to help local communities reduce their flood risk, with an emphasis on nonstructural approaches with a mandate to provide technical assistance to regional teams.³⁴
- Provide at least \$400 million in appropriations to the Aquatic Ecosystem Restoration program to restore aquatic habitat where the aquatic ecosystem structure, function, and processes have been degraded.³⁵

Generate economic prosperity

As the climate warms, sea levels will rise, coastal flooding will increase, and extreme events such as hurricanes and storm surges will become more severe.³⁶ Because nearly 40 percent of Americans live in a coastal county,³⁷ failing to prepare for the effects of climate change will put lives, property, and economic activity at risk. The investments detailed in this section directly protect infrastructure and enhance ecosystem resilience, thus helping to secure the jobs that rely on both.

Transportation infrastructure

DOT's Federal Aviation Administration (FAA), Federal Highway Administration (FHWA), and Amtrak should all consider how to relocate or adapt their projects to ensure resilience from sea level rise and severe storms as well as to improve coastal conservation and environmental justice outcomes.

Mitigating the impacts of sea level rise is critical to the reliability of the nation's increasingly busy air travel system. Thirteen of the nation's 47 largest airports have at least one major runway vulnerable to moderate storm surge,³⁸ and many are located in low-lying wetlands.³⁹ In order to address the risks that climate change poses to air travel infrastructure, Congress should:

- Direct the FAA to require Airport Improvement Program (AIP) grant recipients to leverage the Airport Sustainability Planning program.⁴⁰ This would require airports to develop climate resilience strategies for facilities at or below sea level, while also allowing AIP funds to be used for rehabilitation of impacts on coastal ecosystems.⁴¹
- Revise the Voluntary Airport Low Emission⁴² and the Zero Emissions Vehicle and Infrastructure Pilot⁴³ programs to include nature-based infrastructure and blue carbon ecosystem restoration as eligible initiatives to partially mitigate airport facility emissions.
- Raise the collection level for the Passenger Facility Charge Program for emission-reduction and resilience projects.⁴⁴

The FHWA is responsible for distributing funds to state departments of transportation, ensuring that construction meets federal standards, and providing direct design and construction services. With an estimated 60,000 miles of coastal highways in the United States vulnerable to coastal erosion and storm overwash,⁴⁵ highway surface area has a significant impact on coastal ecosystems—both in terms of directly building on coastal habitat and indirectly affecting it through runoff pollution.⁴⁶ For example, in Washington state’s Puget Sound, untreated highway runoff was found to be universally lethal to adult coho salmon, but nature-based stormwater treatment infrastructure reduced mortality while improving local water quality.⁴⁷ The U.S. House of Representatives’ 2020 Moving Forward Act included preliminary steps to address highway flooding, provide wildlife corridors for terrestrial and aquatic ecosystems, and invest in stormwater best management practices, all of which should be reintroduced.

However, the FHWA can do more to protect salmon and other watershed-dependent species. While the FHWA currently funds research into highway-generated pollution, Congress should also:

- Authorize the FHWA to fund nature-based runoff management projects. In addition to improving support for enhanced runoff practices, the FHWA should enhance its support for the National Cooperative Highway Research Program to further investigate the environmental impacts of highway runoff and design improvements for the federal highway system to mitigate these impacts, especially near bodies of water and wetlands.⁴⁸
- Direct the FHWA’s Ferry Boat Discretionary Program to prioritize programs that electrify ferries and transit connections, reduce marine noise, and undertake planning for harbor projects that avert interactions with marine mammals.⁴⁹

Finally, Amtrak should continue its critical low-emission transportation service system in busy corridors while planning for sea level rise and other climate change impacts. With large swaths of Amtrak’s rail system at risk of permanent inundation⁵⁰—and no comprehensive vulnerability assessment to speak of—Congress should direct Amtrak to create a comprehensive strategy for its coastal tracks, including mitigation and adaptation priorities for future routes.

International water resource management

The St. Lawrence Seaway Development Corp. (SLSDC)⁵¹ and the International Boundary and Water Commission (IBWC)⁵² are independent agencies that manage transboundary watersheds. The SLSDC manages the networks of locks and maritime

infrastructure that connect the Great Lakes and eastern canals to facilitate maritime freight. The IBWC oversees the allocation of freshwater resources from rivers and streams across the U.S.-Mexico border as well as water quality and sanitation project development. These agencies have many opportunities to address complex ocean threats such as invasive species and nonpoint source pollution as well as impacts on coastal communities.

As climate change exacerbates erosion, runoff, and groundwater contamination,⁵³ nature-based solutions and adaptive coastal structures will be better able than static structures to adapt to changing water levels and wind conditions. Accordingly, Congress should direct the SLSDC to take the following actions:

- Incentivize the replacement of hardened shore infrastructure, such as seawalls, with nature-based mitigation.
- Create a mitigation fund from existing corporation fees and tolls to address invasive species and coastal management.
- Consult with tribes to explore how to improve tribal representation on the SLSDC advisory board, such as by funding a tribal affairs coordinator in the Great Lakes Regional Office.

In southern California, sanitation shortcomings have sent millions of gallons of raw sewage flowing into the Tijuana River and across the U.S.-Mexico border, closing public beaches and posing public and environmental health risks.⁵⁴ To address this problem, Congress should mandate that the IBWC take the following actions:

- Produce a strategic climate resilience plan.
- Establish a permanent water quality monitoring program, as recommended by the Binational Water Quality Study, that leverages citizen science work from both sides of the border to address water quality impacts on vulnerable coastal communities.⁵⁵
- Fully fund the Environmental Protection Agency's (EPA) U.S.-Mexico Border Water Infrastructure Grant Program to enhance the sanitation resources of the U.S.-Mexico border.⁵⁶

Disaster mitigation

The Federal Emergency Management Agency (FEMA) at DHS is the lead agency responsible for responding to disasters such as hurricanes and floods and for helping people to recover in the aftermath of these events. As the climate changes and sea levels continue to rise, disaster management strategy will be increasingly predicated on pre-disaster mitigation and adaptation planning.⁵⁷ Twenty-three years of federally funded mitigation grant data demonstrate that this type of mitigation funding can save the nation \$6 in future disaster costs for every \$1 spent on hazard mitigation.⁵⁸

Ocean resources that support key fisheries and tourism resources can also require disaster assistance; for example, coral reefs can be buried under debris after hurricanes.⁵⁹ As such, FEMA should create a specific program for island territories to protect culturally and environmentally significant ecosystems that provide protection from natural hazards.⁶⁰

To help prepare for future disasters, Congress should take the following actions:

- Appropriate additional funds to FEMA's Building Resilient Infrastructure and Communities⁶¹ program, which funds mitigation projects to lessen the impact of disasters on communities across the United States. Specifically, Congress should waive cost-sharing requirements for communities of color, low-income communities, and tribal communities that face disproportionate risks from climate change and invest in nature-based solutions to flooding and other coastal hazards. FEMA should also provide technical assistance resources for future applicants to the agency's Hazard Mitigation Grants program.⁶²
- Allow for FEMA grants to pay for the relocation and adaptive redesign of critical infrastructure, such as schools, hospitals, stormwater treatment facilities, and transportation hubs. For areas where flooding is too frequent to permit rebuilding, FEMA should provide grants to create natural areas that provide resilience benefits, coastal access, and recreation opportunities.
- Make coral restoration and other blue carbon mitigation projects eligible for 100 percent Hazard Mitigation Grants reimbursement and establish a program for long-term nature-based mitigation of GHG emissions while providing coastal defense.⁶³
- Develop response plans in advance of disasters to quickly recover and restore natural assets, such as coral reefs damaged in major disasters, with partner agencies such as NOAA and the U.S. Department of Interior through the Natural and Cultural Resources Recovery Support Function.⁶⁴

Advance inclusive and equitable development

People who are already vulnerable, including low-income individuals and communities of color, bear a disproportionate share of climate change impacts. While equity should be central to all climate and infrastructure actions, the specific investments in this section are intended to recognize that the protection of people and communities most vulnerable to climate impacts must go hand in hand with protecting the environment.⁶⁵

Waterway restoration

The EPA supports coastal remediation and restoration through water quality grants and direct support for the coastal communities who bear the brunt of natural and industrial hazards. These investments can aid communities in overcoming decades of pollution, exploitation, and, most recently, a pandemic.

These EPA programs can help reduce localized emissions that harm vulnerable communities and coastal ecosystems, while revitalizing healthy and associable urban waters. These impacts can benefit local businesses and enhance educational, recreational, social, and employment opportunities. To help the agency provide support for under-resourced communities and to restore mitigation and adaptation programs cut by the previous administration and deprioritized during the pandemic, Congress should take the following actions:

- Increase funding to the Urban Waters Small Grants program to support nature access in underserved communities and remediate impacts to urban watersheds.⁶⁶
- Ensure that at least 25 percent of future pilot projects for the EPA Ports Initiative’s Community-Port Collaboration⁶⁷ are in nonattainment areas—those considered to have air quality that does not meet the National Ambient Air Quality Standards as defined in the Clean Air Act Amendments—and include options to enhance coastal access and workforce development where appropriate. This program facilitates effective communication and engagement between the port industry, communities, and other port stakeholders.

Capture of ocean-climate benefits upstream

Founded in the wake of the Dust Bowl, the U.S. Department of Agriculture's Natural Resources Conservation Service facilitates small grants and education programs in close partnership with farmers and ranchers, local and state governments, and other federal agencies, in order to maintain healthy and productive working agricultural infrastructure and landscapes.⁶⁸ Natural Resources Conservation Service programs address agricultural infrastructure and landscape planning, including large-scale manipulation of levees and farmland. Thus, their watershed programs fall under the jurisdiction of the Senate Committee on Environment and Public Works and the House Committee on Transportation and Infrastructure. Industrial agricultural practices have substantial impacts on the health of the ocean and Great Lakes, since runoff facilitates harmful algae blooms and contributes to the Gulf of Mexico Dead Zone.⁶⁹ Congress should invest in sustainable management alternatives for farmers across the United States that support runoff mitigation and long-term ocean and Great Lakes health.

To reduce agricultural pollution that affects ocean, coastal, and fisheries health, Congress should take the following actions:

- Fully fund the Agricultural Conservation and the Emergency Watershed Protection Floodplain Easement programs.⁷⁰
- Ensure that the national Watershed and Flood Prevention Operations Program is fully funded to support state branches; direct the state branches to inform farmers and grant recipients of the ocean health impacts of their work; and appropriate additional funding to support education on ocean impacts from agricultural activity.⁷¹
- Specify that small- and mid-scale farmers' agricultural runoff linked to harmful algal blooms and hypoxia downstream is acceptable justification for voluntary land acquisition or easement eligibility under the Agricultural Conservation program.

Equitable coastal transportation

Increasingly dense cities serve as critical hubs for maritime commerce and intermodal transportation networks, while also containing important coastal resources. Yet historically, there has been little public transit connectivity between dense urban areas and the coastal zone.⁷² A 2016 survey indicated that only 3.4 percent of beachgoers took public transit,⁷³ and a separate poll found that a majority of potential beachgoers, especially people of color, cited limited public transit as a significant barrier in accessing coastal areas.⁷⁴

Communities of color and low-income communities are more likely than white, moderate-income, or high-income communities to live in nature-deprived areas. These communities both bear the burden of nature destruction and have less access to the benefits of nature, including air and water purification; climate change mitigation; biodiversity and disease control; and opportunities for leisure, recreation, and improved mental health.⁷⁵ Promoting more equitable access to nature could reduce these disproportionate impacts on communities of color and economically disadvantaged communities while addressing legacies of racism and injustice in natural resource policy.

Congress should direct and fund the Federal Transit Administration (FTA) to conduct pilot studies on how to facilitate access to the coast and other natural areas. These pilots should address three core problems of transportation-related coastal access:

1. Local access in coastal metropolitan areas—such as San Diego and New York City—where transit exists but local access to coastal recreation is limited by the extent of transit, cost, or parking. Pilots should look at how to best extend existing urban networks to facilitate access to the coasts.
2. Regional access where coastal recreational opportunities are a few hours away by car or bus—such as the greater Washington, D.C., region. Pilots should consider if frequent over-the-road coach-style service, including services provided by a private third-party operator, would improve access to the coasts.
3. The use of alternative transportation options to improve first mile/last mile coastal access.

All pilot programs should also plan and budget for marketing and outreach to ensure that potential customers know about the options provided by the program.

In addition, Congress should require the FTA Office of Environmental Programs' Coordinating Council on Access and Mobility to address access to nature in its annual reports to Congress.⁷⁶

Conclusion

Climate change is no longer a distant threat; it is here, and it is harming people and communities right now. In 2020, there were 22 extreme weather events in the United States that caused damage exceeding \$1 billion each—a new annual record that shattered the previous record of 16 events that happened in both 2011 and 2017.⁷⁷ Experts with high-level government experience have argued that a whole-of-government climate response is necessary to mitigate the loss of life, property, and decades of taxpayer investment.⁷⁸

The good news is that after four years of moving in the wrong direction, the United States is finally poised to take bold action on infrastructure and climate. As the new administration and Congress prepare to pursue an ambitious infrastructure plan that can also tackle the climate crisis, they should look to the ocean for solutions.

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As progressives, we believe America should be a land of boundless opportunity, where people can climb the ladder of economic mobility. We believe we owe it to future generations to protect the planet and promote peace and shared global prosperity.

And we believe an effective government can earn the trust of the American people, champion the common good over narrow self-interest, and harness the strength of our diversity.

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We develop new policy ideas, challenge the media to cover the issues that truly matter, and shape the national debate. With policy teams in major issue areas, American Progress can think creatively at the cross-section of traditional boundaries to develop ideas for policymakers that lead to real change. By employing an extensive communications and outreach effort that we adapt to a rapidly changing media landscape, we move our ideas aggressively in the national policy debate.

