

NCEL & Seattle Aquarium

# Healthy Ocean & Coasts Briefing Book



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# Healthy Ocean & Coasts Briefing Book

## Background

The ocean is often referred to as the heart of the planet — from generating over half the air we breathe to absorbing excess carbon in the atmosphere, serving as home to millions of species, and providing important resources to coastal and inland communities. But, when precious ocean resources and the surrounding environment are not sustainably managed or decisions are made without intentional input from coastal communities, frontline communities, and Indigenous Communities, negative impacts like ocean acidification, decreased marine biodiversity, coastal erosion, environmental injustices, and sea-level rise can emerge.

*\*This briefing book was developed in partnership with the [Seattle Aquarium](#).\**

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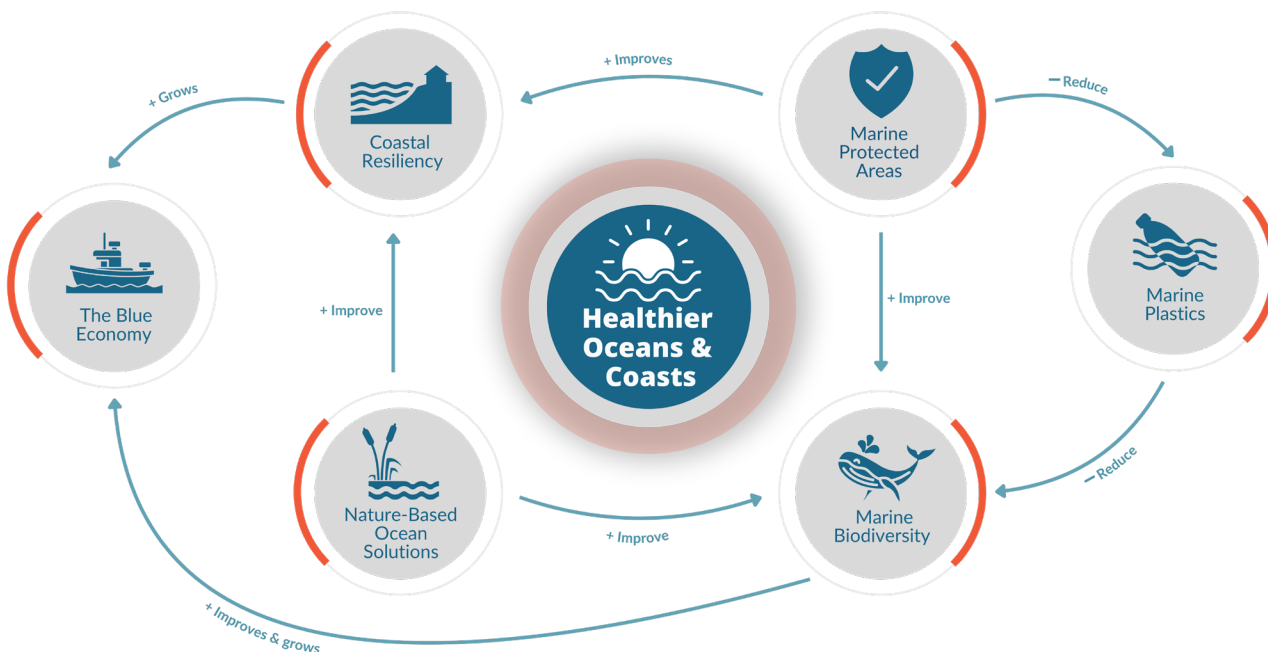
## Briefing Book Overview

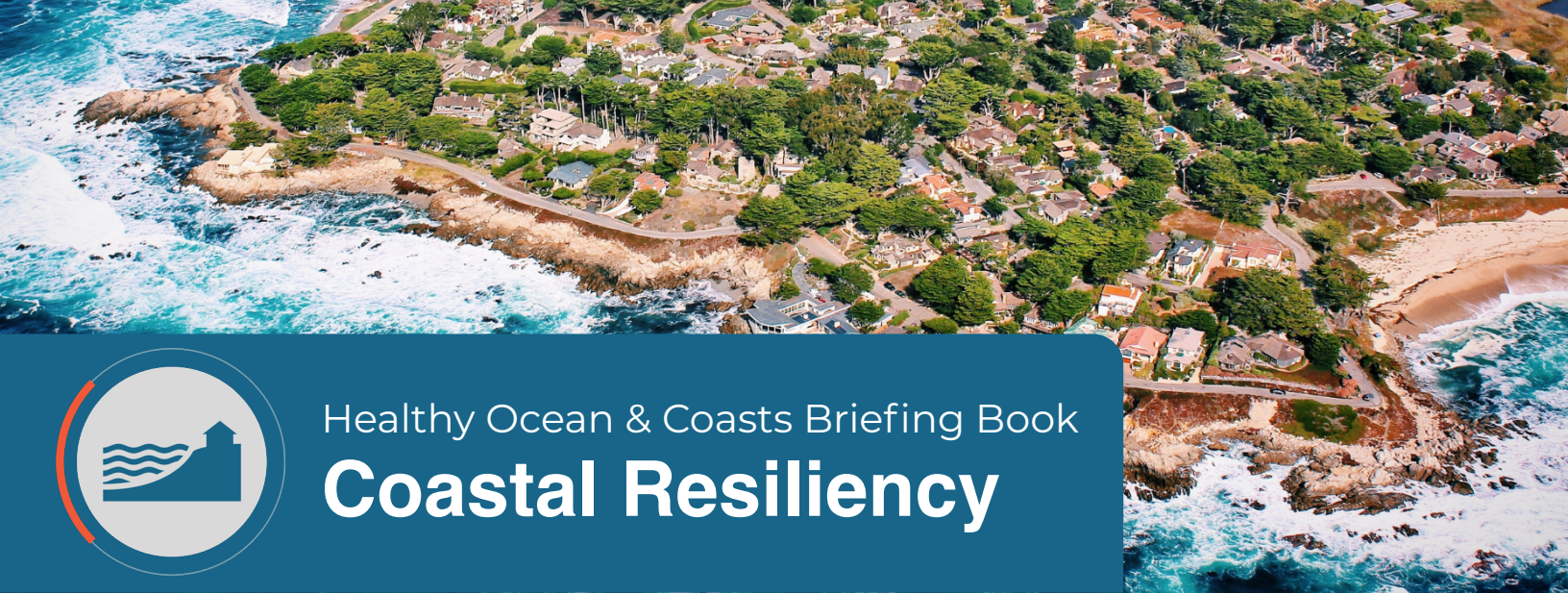
### Why the Briefing Book Was Created

In 2023, representatives of legislative offices from Washington, Oregon, and California [gathered at the Seattle Aquarium](#) with the National Caucus of Environmental Legislators to discuss regional coastal topics. Policies surrounding marine protected areas, the blue economy, and nature-based solutions were top of mind during the convening. The group had robust conversations regarding connections between these policy areas and other topics like species biodiversity, climate resiliency, job creation, economic growth, and marine debris (see illustration below). Attendees left the convening with the shared realization that if these issues were treated as interconnected rather than disparate, policies that protect marine ecosystems, the blue economy, and coastal communities could advance further in their legislatures.

### How to Use this Briefing Book for Holistic Ocean Policy

This briefing book is intended to provide an overview of some of these major ocean topics that state legislators across the country are contending with, using existing policies to illustrate how introducing legislation to remedy one ocean issue can have significant co-benefits across coastal ecosystems. Each section will feature policy examples from around the country and a case study illustrating how these issues are being addressed. **The graphic below shows the six ocean issues covered in this briefing book and the ways their benefits and impacts interact.**





# Healthy Ocean & Coasts Briefing Book

## Coastal Resiliency

### Overview

Roughly [40% of the U.S. population](#) lives in coastal counties. These coastal counties produce \$10 trillion in goods and services annually and employ 54.6 million people. Human-induced climate change, paired with coastal overdevelopment, has contributed to widespread economic damages due to rising seas, intensifying storms, and coastal erosion. A [NASA study](#) predicts that sea levels could rise by an average of 12 inches along U.S. coastlines by 2050. These impacts put ocean economies, defense infrastructure, coastal ecosystems, and communities at risk. [Disproportionate impacts](#) will be felt by low-income communities, communities of color, and Indigenous Peoples living along the coasts and will exacerbate existing inequities like housing instability, environmental pollutant exposure, and school closures.

### Benefits & Impacts

Policies that safeguard coastal ecosystems and support natural coastal resilience projects will help buffer the worsening physical and economic impacts of climate change. They also provide opportunities to improve coastal biodiversity through wetlands and coastal habitats that buffer against storms, protect coastal ecosystems from saltwater intrusion, and generate jobs.

### Policy Examples

- **[California SB.852 \(enacted 2022\)](#)**: Permits cities, counties, or special districts to establish “climate resilience districts” to raise revenue through tax increment funding, voter-approved property tax, benefit assessments, or fee supplements. The districts can use the revenue to finance eligible projects that address climate risks, including living shorelines, flood easements, and structure elevation.
- **[Rhode Island H.7022 \(enacted 2024\)](#)**: Requires the Chief Resilience Officer to create, maintain, and update a resiliency and community recovery program. It also mandates the development of long- and short-term strategies for climate resilience and adaptation along the coast, actions for the state to take), and the creation of a diverse advisory board.
- **[Maryland HB.233 \(enacted 2024\)](#)**: Modifies the existing [Chesapeake and Atlantic Coastal Bays Critical Area Protection Program](#). Each project in the program must ensure equitable distribution of burdens and benefits of development, restoration, conservation, and adaptation projects; conserve, restore, or create natural and nature-based features for climate resiliency; and include provisions to ensure public access to the water, shorelines, and other natural areas for underserved and overburdened communities.



### South Carolina's Strategic Statewide Resilience and Risk Reduction Plan

The [South Carolina Office of Resilience](#), developed in 2020, is tasked with creating, implementing, and maintaining a [statewide resilience plan](#) to guide investments in flood mitigation and the adoption of policies and programs to protect people and property from extreme weather events. The Office collaborated with over 100 groups and individuals at the local, state, and federal level over two years to create the state's first data-driven evaluation of current and future flood and natural hazards. Recommendations offered in the plan are holistic and encompass concepts such as: establishing protections for isolated wetlands that may no longer be protected after the [Sackett v. EPA ruling](#), the use of new flood mitigation conservation maps in all state agency planning, and the incorporation of nature-based design solutions in zoning and land-use projects. You can read the full plan [here](#).

**Photo:** Coastal flooding in Charleston, SC - November 7, 2021 (courtesy of Steve Taylor). Source: [National Weather Service](#).



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# Nature-Based and Living Shoreline Solutions

## Overview

Nature-based solutions use plants and ecosystems such as mangrove or kelp forests to reduce coastal impacts and risks. For example, [salt marshes](#) play an integral role in protecting coastal communities by serving as buffer zones during weather events like winter storms and the accompanying storm surge. They further protect coastal communities and coastlines from erosion by filtering excess nutrient runoffs and trapping sediments.

[double](#) the amount of carbon dioxide as terrestrial forests. It is estimated that [mangroves in Florida](#) averted over \$1.5 billion in storm damages during Hurricane Irma (2017) and protected over 626,000 people across Florida. Their placement can also extend the lives of built infrastructure like seawalls, providing a first line of defense for storm surges.

## Policy Examples

- **Oregon HB.4132 (enacted 2024):** Requires the creation of an adaptive management plan for marine reserves including an assessment of the capacity for marine reserves to enhance ecological resilience to environmental disturbances.
- **Maryland SB.417 (introduced 2023):** Alters the requirements for improvements made to protect a person's property against erosion to ensure that improvements increase coastal resilience, habitat connectivity between the land and water, and incorporate the use of living features such as marsh grasses or submerged aquatic vegetation, among other provisions.
- **Massachusetts H.906 (introduced 2024):** Directs the Secretary of Energy and Environmental Affairs to undertake a wetlands restoration streamlining initiative to expedite nature-based wetlands restoration projects and provide technical assistance to state, nonprofit, and municipal project proponents.

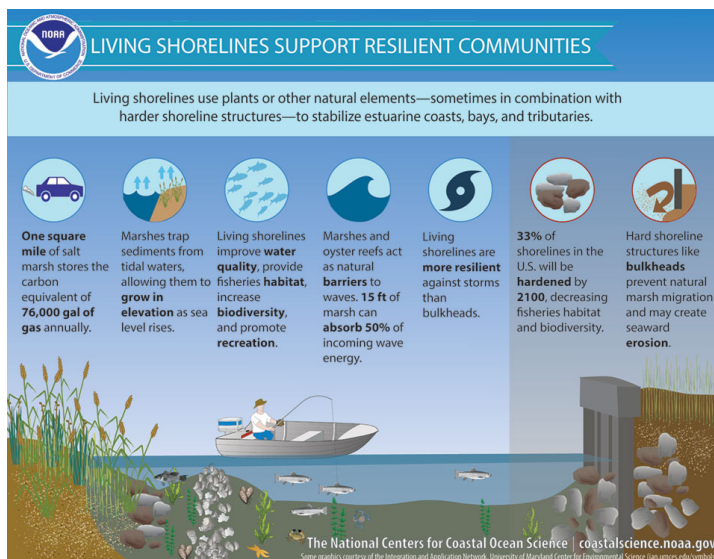


Figure 1: Infographic illustrating the meaning and benefits of a living shoreline. Source: NOAA.

## Benefits & Impacts

The benefits of nature-based solutions extend beyond coastal zone protection and resiliency. Eelgrass meadows serve as essential fish and shellfish [habitats](#) while [sequestering over](#)



### The Value of Restoring Hawai'i Coastal Sand Dunes

The [Kapukaulua Dune Restoration](#) area located on Maui's north shore demonstrates the co-benefits associated with nature-based solutions. Due to increased foot traffic, the coastal dune began to erode, resulting in unsafe beach conditions and a depleted natural barrier against rising sea levels. Partners including the County of Maui, Hawai'i Sea Grant, and local nonprofits worked together on a [restoration project](#) for the area that focuses on both habitat restoration and community resilience. Through careful planning and community input sessions, [guiding principles and restoration strategies](#) were developed for the project. In September 2024, a pavilion on the beach in the project area [collapsed](#) due to high surf and rising seas. The restoration plans will enable these partners to work together to restore the dune and consider the intentional rebuilding of the pavilion farther away from the sea. Hawai'i Sea Grant developed a [Hawai'i Dune Restoration Manual](#) to increase awareness about the importance of coastal dunes and offer best practices for restoration.

**Photo:** Volunteers taking part in dune restoration with native plants at the sight of the collapsed pavilion at Kapukaulua (Baldwin Beach). Source: [Hawaii Sea Grant](#).





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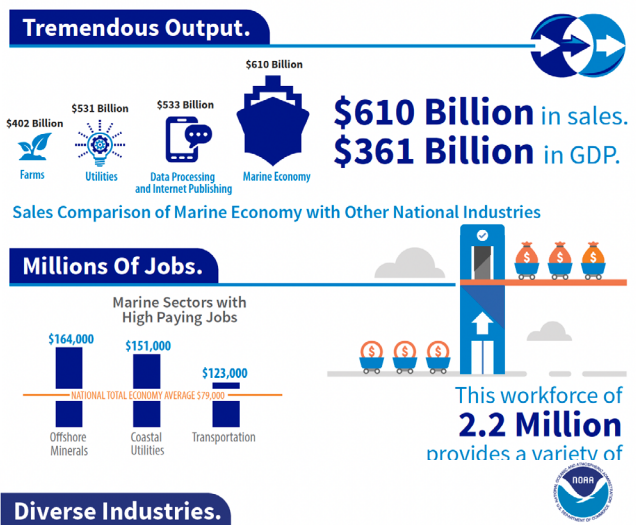
## Sustainable Blue Economy

### Overview

The sustainable [blue economy](#) encompasses sectors and services dependent on the ocean and coastal waters like fishing, tourism and recreation, ocean exploration, shipbuilding, and renewable energy generation. [According to NOAA](#), the U.S. blue economy generated \$777 billion in sales in 2022 and supported 2.4 million jobs (see figure 2) — a \$167 billion increase in sales and a 200,000 increase in jobs from [2021 numbers](#).

### Benefits & Impacts

Given the breadth of activities under the sustainable blue economy umbrella, policies that protect sustainable coastal industries can also spur a renewable energy transition, preserve fishing and aquaculture practices, increase coastal tourism, protect coastal infrastructure, and more. There are also [potential risks](#) associated with these policies, including livelihood impacts, dispossession and displacement, inequitable distribution of benefits, and exclusion from governance. New policies have the opportunity to address these risks alongside the potential for increased sustainable ocean development.



**Marine Sectors Sales in 2020 (Inflation Adjusted)**

Tourism and Recreation	\$191 Billion
Defense and Public Administration	\$187 Billion
Offshore Minerals	\$97 Billion
Transportation	\$54 Billion
Fisheries and other Bio-products	\$27 Billion
Ship and Boat Building	\$16 Billion
Coastal Utilities	\$15 Billion
Research and Education	\$11 Billion
Construction	\$7 Billion
Professional and Business Services	\$6 Billion

Figure 2: America Marine Economy infographic (updated June 2022). Source: NOAA

## Policy Examples

- **Oregon HB.4080 (enacted 2024):** Creates a roadmap for offshore wind development in the state, with the inclusion of strong community and workforce development provisions that require: a plan for outreach, recruitment, and retention of women, veterans, and minority individuals for projects; that apprentices perform 15% of applicable projects; and robust stakeholder engagement including Tribes and fisheries. The roadmap must also ensure the protection of the environment and marine species to ensure responsible offshore wind development in the state.
- **Florida H.R.1285 (enacted 2024):** Creates the [Office of Ocean Economy](#) within the State University System to develop and expand blue economy resources, encourage research and collaboration among ocean users, and develop strategies to ensure ocean and coastal resilience.
- **Rhode Island SB.2953 (introduced 2024):** Would establish a commercial dock space preservation fund under the Department of Environmental Management to help commercial fishers preserve, maintain, or obtain dock space to ensure the long-term prosperity of the state's seafood industry alongside increased waterfront development interests.



### Blue Economy Case Study



## Indigenous-Led Kelp Farming in Alaska

Ocean acidification, continued resource extraction, and environmental disasters like the Exxon Valdez oil spill have threatened the availability of key species like Pacific Herring and wild salmon. As these species numbers dwindled, community members recognized the need to diversify their aquaculture practices and restore their coastal habitats and saw kelp farming as a potential solution. Together, the [Native Conservancy and Eyak Presentation Council created an immersive kelp and mariculture training program for Indigenous farmers](#). The goals of this program are to help create additional economic pathways for Alaskan Native communities, restore kelp forests that keystone species like Pacific herring and salmon call home, and sequester excess carbon. The program has helped place nine kelp research sites and one commercial farm, as well as expand kelp reframing test sites across 100 miles of the Prince William Sound.

*Photo: Cordova, Alaska.*



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## Marine Biodiversity

### Overview

Marine biodiversity encompasses the variety of life in the ocean and seas, which includes an estimated [2 million species](#) — many of which have yet to be discovered. The ocean and its coasts help provide essential goods and services like food, climate regulation, job opportunities, and a sense of cultural identity for many communities. Unfortunately, marine biodiversity and the benefits associated are at risk due to ocean acidification, overharvesting, coastal erosion, and human-induced climate impacts.

### Benefits & Impacts

Innovative policy mechanisms that expand marine species protections and invest in marine restoration efforts can have broader positive impacts on local economies by increasing tourism to these conserved areas, improving fishery catches, sequestering excess carbon that contributes to climate change, and more. Effective marine conservation requires an inclusive approach that brings together policymakers, Tribes, industry, academia, and communities to identify solutions. The development and implementation of unified marine biodiversity strategies provide an opportunity for all to protect and conserve marine resources while promoting collaborative community-led approaches, restoring Indigenous and Tribal stewardship, and incorporating humans as part of nature-based solutions.

### Policy Examples

- **[Washington SB 5619 \(enacted 2022\)](#)**: Requires a conservation plan to conserve and restore approximately 10,000 acres of native kelp forest and eelgrass meadow habitats along the Washington state coastline and Puget Sound by 2040. Included in the plan is the need to identify sites to restore these habitats to support salmon recovery, improve water quality, and mitigate the impacts of ocean acidification.
- **[Alaska HB.39 \(enacted 2024\)](#)**: Appropriated funds for the [Chugach Regional Ocean Monitoring Program](#), which studies changes in ocean chemistry, algal blooms, and shellfish biotoxins. The [program](#) helps inform safe harvesting and shellfish consumption practices, develops a civil sampling program for water quality testing, and helps build capacity for Tribes to continue cultural harvesting and aquaculture practices.
- **[Massachusetts Executive Order 618 \(2023\)](#)**: Directs the Massachusetts Department of Fish and Game to develop [statewide biodiversity conservation goals](#) for 2030, 2040, and 2050 in consultation with diverse stakeholders. Among many other provisions, the [Massachusetts Vision 2050 for Biodiversity](#) includes plans to restore fish passages, upgrade storm and wastewater treatment to protect shellfish growing areas, and protect and restore salt marsh and eelgrass habitats.



### Quieting the Waters for Endangered Whales

This Maritime Blue program mitigates the impacts of large commercial vessels on the endangered Southern Resident killer whales in Washington State. The program has received funding from the Washington State Legislature (among other funding sources, including NOAA, US Coast Guard, and EPA) and establishes voluntary vessel slow-down periods to combat underwater noise pollution, which greatly impacts the health of Southern Resident killer whales. A nonregulatory program, Quiet Sound is designated a key partner in Southern Resident killer whales' recovery by the federal government and Washington State, and is led by a decision-making coalition that includes the Makah Tribe, NOAA Fisheries, the Northwest Indian Fisheries Commission, and the Seattle Aquarium, among others. In the 2023-2024 slow-down period (October 12, 2023 through January 12, 2024), 71% of vessels followed Quiet Sound's guidelines to reduce their speed and underwater noise pollution was reduced by 50% while Southern Resident killer whales were present. The 2024-2025 slow-down period went into effect on October 6, 2024 and ended on January 12, 2025 – the results are currently being tabulated.

**Photo:** Members of L Pod with a tanker in Washington State. Source: Donna George, Orca Network



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## Marine Protected Areas

### Overview

[Marine Protected Areas \(MPAs\)](#) are designated regions managed for the long-term conservation of marine resources, ecosystems, or cultural heritage. There are almost [1,000 MPAs](#) across U.S. waters, including national marine sanctuaries and monuments, national parks, national wildlife refuges, state parks, and locally protected areas. The [level of protection](#), management plans, usage, and legal authorities for MPAs can differ greatly: those deemed “fully protected” forbid activities like deep sea mining and commercial fishing while “minimally protected” allow selective purposes like dredging, aquaculture, or renewable energy infrastructure.

### Benefits & Impacts

The establishment of MPAs [can result](#) in habitat restoration, higher fishing catches, improved carbon capture through protected habitats, increased sustainable tourism, and unique education and research sites that are preserved in their natural form. Unfortunately, Indigenous Communities, Black and Brown communities, and low-income communities are often left out of the MPA planning and management process. The traditional conservation space often views humans as separate from nature, neglecting the value and importance of Indigenous leadership in promoting sustainable, balanced use of natural resources. MPAs provide states the opportunity to protect and conserve marine resources through community- and collaboratively-led approaches.

### Policy Examples

- [Oregon HB.4132 \(enacted 2024\)](#): Increases the state’s investments in its marine reserves and MPAs and outlines an adaptive management process to support management strategies and usage plans. Included in the bill are specific goals around outreach and engagement with federally recognized Tribes and fishing fleets to incorporate cultural and historical knowledge into research and monitoring efforts.
- [Florida CS/CS/HB. 1557 \(engrossed 2024\)](#): Designates the [Kristin Jacobs Coral Aquatic Reserve](#), which is the only barrier reef ecosystem in the U.S. and is home to more than 6,000 species of marine life. This designation provides critical protections for this ecosystem while allowing for recreational activities like snorkeling and fishing as well as scientific research opportunities.
- [Puerto Rico PS.1366 \(introduced 2023\)](#): Establishes a natural park reserve along the coastal and marine shoreline in the municipality of Vieques. The Department of Natural and Environmental Resources would design a collaborative management plan for the reserve and protect the area’s seagrass meadows, endangered species, and culturally significant archeological sites while allowing for compatible recreational activities.



### California's Marine Life Protection Act

[California's Marine Life Protection Act \(MLPA\)](#) was signed into law in 1999 with the goal of redesigning the state's existing system of MPAs to function as a network instead of fragmented protected marine habitats.

From 2004 to 2012, a public-private partnership called the MLPA Initiative oversaw the MPA design and siting process for four "study regions" in state waters. For each region, an MPA design process was undertaken, with multiple rounds of design, evaluation, and redesign. Outreach and Education is a mandated piece of the MLPA. Conservationists, fishers, community groups, Tribes, scientists, and others provided critical stakeholder input throughout the process. As a result, the [redesigned MPA Network](#) now covers approximately 16% of state waters compared to less than 3% prior to the MLPA. Upon the [decadal review](#) of the state's MPA Network, benefits ranged from improved species diversity and increased lobster catch to improved ecological datasets to inform endangered species listings and the introduction of [interactive virtual field trip](#) experiences for students. You can learn more about California's MPA system [here](#).

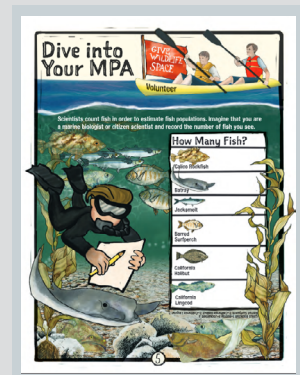


Figure 3: From California MPA's [Coastal Explorer Guide](#).

Photo: Channel Islands National Park in California.



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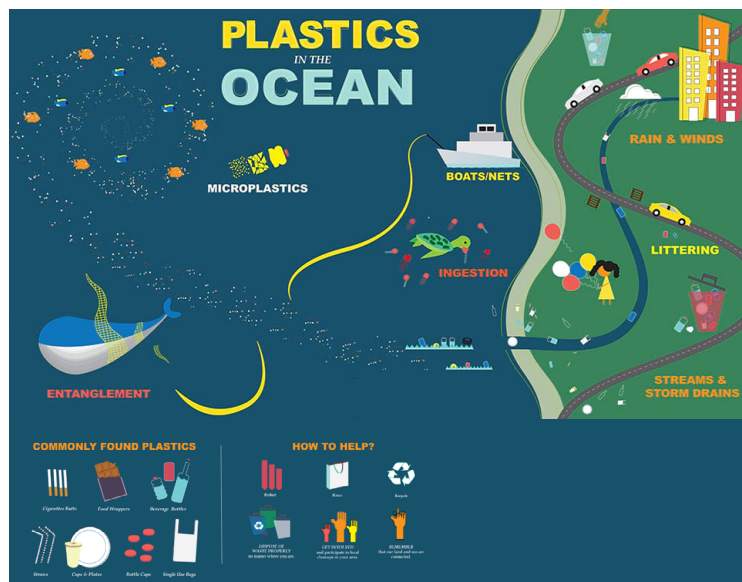
## Marine Plastics

### Overview

Plastic pollution is a threat to wildlife, marine and coastal ecosystems, and human health. Single-use plastics can enter waterways, entangling marine species and dissolving into harmful microplastics. A [recent study conducted by NOAA](#) also found that, when marine debris on beaches is almost entirely removed, coastal economies experience increases in visitations, tourism spending, and local job offerings. Over [99% of plastic](#) is made from chemicals sourced from fossil fuels, with many oil refineries and plastic chemical plants located in Indigenous Communities, Black and Brown communities, and low-income communities. Residents in these communities are [overburdened](#) by toxic risk exposure, chemical accidents, and respiratory illness. There are readily available sustainable alternatives to many single-use plastics, particularly those used for packaging.

### Benefits & Impacts

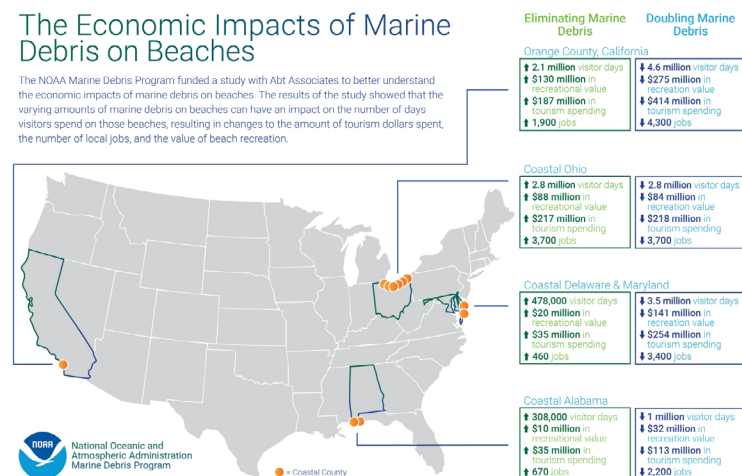
Policies that promote a more circular economy and make plastic producers responsible for the waste they create are critical in reducing plastic waste. These policies can also help decrease greenhouse gas emissions and human exposure to pollution from production facilities, protect marine biodiversity and species health by reducing microplastic and large plastic ingestion, and help keep our beaches and roadsides clean.



**Figure 4:** Yellow text in the above graphic shows sources of plastic that eventually end up in the ocean. Orange text shows ways that these plastics move into the ocean. Red text provides examples of the harmful impacts of this debris. Source: [NOAA](#)

### The Economic Impacts of Marine Debris on Beaches

The NOAA Marine Debris Program funded a study with Abt Associates to better understand the economic impacts of marine debris on beaches. The results of the study showed that the varying amounts of marine debris on beaches can have an impact on the number of days visitors spend on those beaches, resulting in changes to the amount of tourism dollars spent, the number of local jobs, and the value of beach recreation.



**Figure 5:** The results of a NOAA Marine Debris Program funded study with Abt Associates meant to better understand the economic impacts of marine debris on beaches. Source: [NOAA](#).

## Policy Examples

- **California SB. 54 (enacted 2022):** Establishes a new Extended Producer Responsibility (EPR) program that requires producers and manufacturers to reduce single-use plastic packaging and food service products by at least 25 percent by 2032 and reach product recycling rates of at least 65 percent. The bill also requires plastic producers to create and fund a Producer Responsibility Organization, which must deposit a total of \$5 billion over 10 years into the California Plastic Pollution Mitigation Fund.
- **Washington HB 1085 (enacted 2023):** Reduces plastic pollution from three distinct sources: single-use plastic bottles, specific floating structures, and certain plastic packaging in hotels. Starting in July 2026, new buildings required to contain drinking fountains must also have an equivalent number of bottle-filling stations. Beginning January 2024, the sale and installation of overwater structures containing plastic foam not contained in a sufficiently thick shell is banned to reduce foam dock pieces from entering the ocean. The bill also phases out single-use plastic packaging for personal care products like hand lotion, soap, shampoo, and body wash in hotels and other lodging establishments starting in January 2027.
- **Colorado HB. 24-1499 (enacted 2024):** Merges existing recycling and waste diversion programs into a new Colorado Circular Communities Enterprise (C3). C3 will award grants and technical assistance to local governments nonprofits, schools, and businesses that pursue a circular economy for waste management plans. Grants will be funded via fees from waste producers, which will also be used to improve circular economy infrastructure.



### Marine Plastics Case Study



## Banning Travel-Sized Bottles in Hotels Across the Country

In 2019, California passed [AB.1162](#) requiring hotels, motels, resorts, and vacation rentals to eliminate single use plastic personal care products six ounces or smaller in favor of bulk dispensers. Authorized lodging agencies have the authority to inspect an establishment and issue penalties of \$500 for the first offense and \$2,000 for subsequent offenses. [Marriott International](#) claims that such a move would save an average of 250 pounds of plastic per year for a 140-room hotel from entering the waste stream. New York State swiftly followed suit and passed [SB.543](#) which prohibits single-use plastic personal care bottles smaller than 12 ounces in hotel rooms. The law took effect for hotels with more than 50 rooms in January 2024, with the deadline for smaller hotels set for January 2025. [Washington](#) also enacted a similar law in 2023 and [Illinois](#) enacted a similar law in 2024, indicating the popularity of this policy solution.









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