

ENHANCING THE BLUE ECONOMY THROUGH COASTAL MANAGEMENT



September 2022

Executive Summary

The Blue Economy depends on the vibrant workforce, thriving industry, advanced infrastructure, and unparalleled natural resources of the nation's coastal zone. Across the nation, the challenges confronting coastal communities are vast and complicated. To ensure our coastal zones continue to enrich and sustain the Blue Economy, robust, adaptive, and efficient coastal management is necessary.

For over 50 years, State and Territory Coastal Zone Management (CZM) Programs, in partnership with the National Oceanic and Atmospheric Administration (NOAA), have provided the *effective management, beneficial use, protection, and development* that the coastal zone needs. The State and Territory CZM Programs take the lead to manage coastal resources using their expertise and firsthand experience working on local issues, and NOAA provides guidance, funding, and program support.

State and Territory CZM Programs enhance the Blue Economy by assisting coastal communities to build **coastal resilience**, manage **living resources**, promote **tourism and recreation**, support **maritime transportation and commerce**, and develop the **new blue economy**.

For example, between 2011 and 2021, State and Territory CZM Programs –

- Completed over **2,500 projects** to improve resilience to coastal hazards and worked with **over 3,000 communities** nationwide to help them grow in a balanced way.
- Created or enhanced more than **3,200** public access sites to support coastal recreation and tourism.
- Restored or protected **over 121,000 acres** of coastal habitat, sustaining the natural systems that support coastal communities and the Blue Economy.

But the contributions of the State and Territory CZM Programs extends beyond just statistics. This report highlights examples of how CZM Programs are advancing the Blue Economy across the country and shows that investments in CZM Programs are investments in the Blue Economy.

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Defining the Blue Economy

The Blue Economy is the sustainable use of ocean resources for economic growth, improved livelihoods, and jobs, while preserving the health of ocean and coastal ecosystems. The United States depends on the Blue Economy for food, transportation of goods, recreation, and employment.

The Blue Economy is comprised of five key sectors:

1. **Coastal Resilience** — a combination of habitat protection, restoration, enhancement, and creation projects; investments in coastal infrastructure; and long- and short- term resilience and adaptation planning designed to ensure coastal communities are resilient to coastal change. This sector drives jobs in project management, planning, engineering and design, and construction and drives economic benefits for the communities these projects are designed to help.
2. **Living Resources** — the sustainable management of living resources drives benefits from providing important food sources, creating fishing and aquaculture jobs, and supporting the tourism and recreation sector by conserving species and ecosystems such as coral reefs and whale populations that are major attractions.
3. **Tourism and Recreation** — the conservation and stewardship of coastal spaces combined with investments to expand and enhance coastal access brings people to coastal areas for tourism and recreation. This sector creates jobs in coastal communities directly in coastal recreation and tourism activities such as equipment rentals or boat tours as well as in related hospitality sectors including hotels and restaurants in destination areas.
4. **Marine Transportation and Commerce** — the beneficial use and development of coastal areas with ports, urban waterfronts, and working waterfronts and the siting, permitting, and development offshore energy development and the necessary land side infrastructure. This sector sustains jobs in the shipping industry, extractive industries such as fisheries, expanding industries such as offshore wind energy development.
5. **New Blue Economy** — the deployment of observation assets and the capture of critical ocean and coastal data coupled with the development of novel tools to tailor this information to inform end user decision-making drives innovation and job creation.

The Blue Economy in turn depends on the coastal zone – its people, its industry, and its irreplaceable natural resources. The thriving cities, vibrant beaches and estuaries, and historic communities of the coastal zone derive their booming economies and cultural identity from their connection to the ocean and Great Lakes.

The Coastal Zone—An Economic Powerhouse

Coastal counties are national economic drivers, employing more than 58.3 million people and generating \$9.5 trillion toward the nation's gross domestic product (GDP).² Coastal areas are also home to the nation's commercial ports and harbors, ocean-dependent maritime industries, tourism and recreation businesses, and vital cultural landmarks and centers. With 90% of international trade conducted by sea, our ports connect the nation to the oceangoing international trade network and the economic bounty of the world.³

Coastal Economy

Coastal counties produce more than \$9.5 trillion in goods and services annually and employ 58.3 million people. If the U.S. coastal counties were an individual country, it would be the world's third largest economy.¹

Coastal Ecosystems Sustain Communities

Coastal ecosystems comprise a diverse blend of various habitat types and geological features, making them some of the most diverse and productive ecosystems in the world. Our coastal ecosystems include everything from coastal plains, pine forests, salt and freshwater dunes, estuaries, bayous, mangroves, saltmarshes, and coral reefs. These ecosystems are critical to fisheries and wildlife, are culturally vital to coastal communities, and provide ecosystem services including water quality protection, storm surge attenuation, and flood mitigation. For example, coastal wetlands slow the release of stormwater into estuarine systems and allow sediments and associated nutrients to settle out of suspension prior to entering the nearshore area. This buffer effect helps prevent harmful algal blooms and the negative impacts on local shellfish, while reducing sediment load and protecting corals from smothering.



At the same time, the coastal zone is the most densely developed and most ecologically complex area of our nation and it faces critical threats from changing physical and economic conditions. In order to support the Blue Economy, coastal communities must tailor strategies to meet their unique circumstances and challenges.

¹ NOAA Office for Coastal Management, *Fast Facts - Economics and Demographics*, <https://coast.noaa.gov/states/fast-facts/economics-and-demographics.html>

² NOAA Office for Coastal Management, *Fast Facts - Ocean Jobs*, <https://coast.noaa.gov/states/fast-facts/ocean-jobs.html>

³ NOAA Office for Coastal Management, *Fast Facts - Ports*, – <https://coast.noaa.gov/states/fast-facts/ports.html>

Challenges for Coastal Communities and the Blue Economy

Coastal Population Growth and Development

While the coastal counties of the U.S. accounts for less than 10% of U.S. land area, they are home to 40% of the population—128 million people.⁴ The population density of coastal shoreline counties is more than five times greater than the corresponding inland counties - with 461 people per square mile vs. the U.S. average of 87 people per square mile (excluding Alaska)⁵. The coastal zone includes six of the nation's ten most populous cities: New York City, Los Angeles, Chicago, Houston, Philadelphia, and San Diego. While many people live near the coast currently, it is estimated that by 2025, nearly 75% of the population of the United States, over 250 million people, will live within 50 miles of a coast.⁶

Increasing populations and changes in land use are placing unprecedented pressures on the natural environment and the economy. NOAA data demonstrates that coastal land cover changes twice as fast as the rest of the nation - between 1996 and 2016, an area larger than the state of Florida experienced land use change.⁷ This rapid development strains public infrastructure, concentrates risk exposure, and impacts the ecological functions that support the Blue Economy.

The Changing Climate Brings New Challenges

Global mean sea level is projected to increase up to 2.1 meters by 2100, resulting in increased coastal flooding and permanently inundating some developed coastal areas.⁸ Impacts to coastal areas from higher sea levels vary dramatically from state to state and community to community. Some locations such as Norfolk, New England, and New Orleans are seeing some of the globe's steepest rates of sea level rise. Flooding, inundation, and lake level change are also driving increased erosion in coastal zones across the country.

As the climate continues to change, we are seeing increased frequency of severe weather. Increased flooding, inundation, and erosion, coupled with increased frequency of severe storms and increasing population and development is threatening the lives, livelihoods, and economies of coastal communities. The cumulative cost from 142 separate billion-dollar weather events in the U.S. over the past ten years (2012-2021) totaled \$1.0 trillion. While 2021 marked the seventh consecutive year (2015-2021) in which 10 or

⁴ NOAA Office for Coastal Management, *Fast Facts-Economics and Demographics*, <https://coast.noaa.gov/states/fast-facts/economics-and-demographics.html>.

⁵ U.S. Census Bureau, 2014, *American Community Survey (U.S. Census Bureau)* – <https://www.census.gov/data/developers/updates/acs-5-yr-summary-available-2009-2013.html>.

⁶ NOAA Office for Coastal Management, *Fast Facts - Economics and Demographics*, <https://coast.noaa.gov/states/fast-facts/economics-and-demographics.html>.

⁷ NOAA Office for Coastal Management, *Fast Facts – Land Cover Change*, <https://coast.noaa.gov/states/fast-facts/land-cover-change.html>.

⁸ NOAA National Ocean Service, 2022 *Sea Level Rise Technical Report*. <https://oceanservice.noaa.gov/hazards/sealevelrise/sealevelrise-tech-report.html>.



NH Coastal Adaptation Work Group

more separate billion-dollar events impacted the U.S.⁹ Hurricane Ida in 2021 was the fifth most expensive natural disaster in U.S. history, costing over \$75 billion. While the 2017 hurricane season was particularly damaging with three of the six most expensive natural disasters in U.S. history – totaling \$270.3 B and at least 3,167 lives lost.

Changes to climate are also having impacts of living marine resources. With warming waters fisheries species that many coastal economies rely upon are migrating while critical habitats such as coral reefs and seagrasses are being threatened impacts of warming including ocean acidification and diseases. Higher sea levels are also infringing on coastal wetlands and marshes resulting in losses of these critical habitats for fish and wildlife, and are bordered by development and unable to migrate inland. These impacts on living marine resources translate into significant impacts on coastal fisheries, tourism, and recreation which depend upon them.

Adapting to these changes presents an unprecedented planning challenge. The cumulative impacts of the changing climate on the Blue Economy is a critical threat to the nation, requiring comprehensive, community-tailored solutions.

⁹ NOAA National Centers for Environmental Information (NCEI), *2021 U.S. Billion-Dollar Weather and Climate Disasters In Historical Context* (2022). <https://www.climate.gov/news-features/blogs/beyond-data/2021-us-billion-dollar-weather-and-climate-disasters-historical>.

The Coastal Zone Management Program

The National Coastal Zone Management Program (National Program) and the State, Territory, and Commonwealth Coastal Zone Management Programs (CZM Programs) make up the foundation of a successful federal-state partnership to confront the emerging challenges facing our coasts. The founding principle of the CZM Program is that healthy coastal resources support a variety of natural, commercial, recreational, ecological, industrial, and esthetic resources, and that long-term planning is essential for coastal areas to remain the economic drivers they are today.

Coastal Zone Management Act

Established in 1972 by the Coastal Zone Management Act (CZMA), the National Program and CZM Programs achieve the congressionally recognized national priority of supporting “*effective management, beneficial use, protection, and development of the coastal zone.*”

The CZMA sets forth processes, funding, and tools to manage land use and associated risks within the coastal areas. Each State, Territory, and Commonwealth CZM Program is unique. The CZMA provides the States, Territories, and Commonwealths with the flexibility to enact programs that fit their needs, their institutions, and their laws, while still ensuring that every

the CZM Programs meet national management needs and priorities. In some coastal States and Territories, CZM Programs serve as central regulatory agencies, while others are structured as networked programs that coordinate the policies and responsibilities of diverse agencies across state government.

Today, there are 34 NOAA approved State and Territory CZM Programs along Atlantic, Gulf, Great Lakes, Pacific, & Islands coastlines, serving both Republican and Democratic Governors. These State and Territory CZM Program receive federal funding through Coastal Zone Management Grants and match these funds nearly dollar-for-dollar, amplifying the benefits of federal investments in the nation’s coastal zone.

The approved CZM Programs are charged with implementing the mission of the CZMA by:

- Developing and implementing policies for coastal land and water management;
- Coordinating with local, regional, and interstate coastal planning activities;
- Planning for and facilitating coastal dependent development including energy facilities;
- Ensuring public access to coastal areas;
- Identifying and designating areas for preservation, restoration, and conservation;
- Implementing projects to improve the coastal zone through preservation and restoration;
- Acquiring significant estuarine and coastal lands to main ecological function and support other enhancements to the coastal zone;
- Developing and implementing policies to manage coastal nonpoint pollution; and
- Ensuring federal activities in the coastal zone are consistent with the Program’s enforceable policies.

Each year, the National CZM Program collects performance data and summarizes how the State and Territory CZM Programs invested coastal management funds.¹⁰ Priority areas for investment are:

- Protecting and restoring coastal habitats;
- Mitigating coastal hazards;
- Promoting coastal community development;
- Expanding public engagement and expanding public access;
- Protecting coastal water quality; and
- Comprehensive ocean and coastal planning.¹¹

The funds invested across all categories sustain and improve the Blue Economy. Coastal restoration projects protect nursery habitat for fin and shellfish, restore natural buffers from storms, and enhance public access and recreational opportunities. CZM Programs mitigate coastal hazards, protect working waterfronts, and ensure that the coastal zones remain productive and safe.

The State and Territory CZM Programs are a key part of the coastal economic engine and provide expertise and firsthand experience contributing to the Blue Economy. Programs provide coastal communities with financial and technical resources to improve hazard resilience planning and implementation, rehabilitate vital ecosystems, sustain tourism and recreation, support land-based comprehensive planning, create public access improvements, and implement ocean resource management plans.

The following sections highlight some examples of how these programs support the **Blue Economy** by assisting coastal communities to build **coastal resilience**, enhance **tourism and recreation**, manage **living resources**, support **maritime transportation and commerce**, and develop the **new blue economy**

Nonprofit Partner on Coastal Issues



The **Coastal States Organization** (CSO) is a nonprofit organization that represents the Governors of the Nation's coastal states and territories. CSO works closely with governor-appointed delegates, most often the head of the coastal zone management programs in each of the coastal states, to support their work to maintain the health and vitality of our coasts.

¹⁰ NOAA Office for Coastal Management, *Coastal Zone Management Act Performance Measurement System*, (updated May 2021) <https://coast.noaa.gov/data/czm/media/czmapmsguide.pdf>.

¹¹ NOAA Office for Coastal Management, *Funding Summary: 2021*, <https://coast.noaa.gov/data/czm/media/funding-summary.pdf>.

Coastal Resilience

In order to reduce risk along the coast and strengthen the nation's shoreline, CZM programs provide funding, planning support, technical assistance, and critical interagency coordination for coastal communities that are essential to a robust national Blue Economy. Well-coordinated coastal resilience programs save lives and money and protect our valuable homes and businesses along the coast. Locally-focused and regionally integrated coastal resilience work involves coordination across federal and state agencies with jurisdiction over flood risk management, land use management, natural resources, environmental protection, and planning to confront coastal hazards and their increasing frequency. CZM Programs have confronted these challenges by:

CZM Builds Coastal Resilience

Between 2011 and 2021, State and Territory CZM Programs completed over **2,500 projects** to improve resilience to coastal hazards and worked with **over 3,000 communities** nationwide to help them grow in a balanced way.¹² For every \$1 invested in these "hazard-mitigation activities," the U.S. economy saves \$4 in societal losses from future disasters and an additional \$3.65 in costs to the U.S. Treasury from avoided federal disaster-recovery expenditures and lost tax revenues.¹³

Preparing for Increased Tidal Surge and Storms in New Hampshire

[The New Hampshire Coastal Management Program](#) is leading numerous project to promote coastal resilience across the state. One of these projects is the [New Hampshire Tidal Crossing Assessment Protocol](#), a partnership co-led by The Nature Conservancy with support from NOAA, which involved the assessment of 117 tidal crossing across 17 coastal communities, identifying 23 most in need of repair and another 32 crossings that need attention. This project led to a collaboration with the town of Newmarket, New Hampshire, where an undersized culvert caused regular road flooding as a result of increasingly higher tides.¹⁴ With partial funding from NOAA's Office for Coastal Management, the town built a new culvert nearly 9 feet deep by 16 feet wide that can withstand the higher tides and rare flooding events. The [New Hampshire Tidal Crossing Assessment Protocol](#) is now working to make four more New Hampshire crossings stronger and safer to better withstand the rising tides.

Additionally, the New Hampshire Coastal Management Program funded dune grass planting to help restore the Hampton-Seabrook estuary which had lost 86 percent of its dunes since 1776. Through the project, 78 adults and 132 K-12 students planted 15,000 dune grass plants to strengthen dunes along the coast.¹⁵ New Hampshire Sea Grant started the project back in 2015 with a dune grass garden at Hampton Beach State Park which was the source for the dune grass that was transplanted onto the dunes. Recently,

¹² NOAA Office for Coastal Management, *Performance Management Data*.

¹³ Multihazard Mitigation Council, *Natural Hazard Mitigation Saves: An Independent Study to Assess the Future Savings from Mitigation Activities*, https://www.nibs.org/files/pdfs/hms_vol2_ch1-7.pdf.

¹⁴ NOAA Office for Coastal Management, *Fortified Tidal Crossing Will Stand Strong Against Climate Change*, <https://coast.noaa.gov/states/stories/fortified-tidal-crossing.html>.

¹⁵ NOAA Office for Coastal Management, *Replanting Effort Is Restoring Estuary's Lost Dunes*, <https://coast.noaa.gov/states/stories/replanting-effort-restores-lost-dunes.html>.

the Sea Grant plantings have become available to private landowners who are able to use the plantings to strengthen their own beachfront property against flood risks and tidal surge caused by coastal storms.



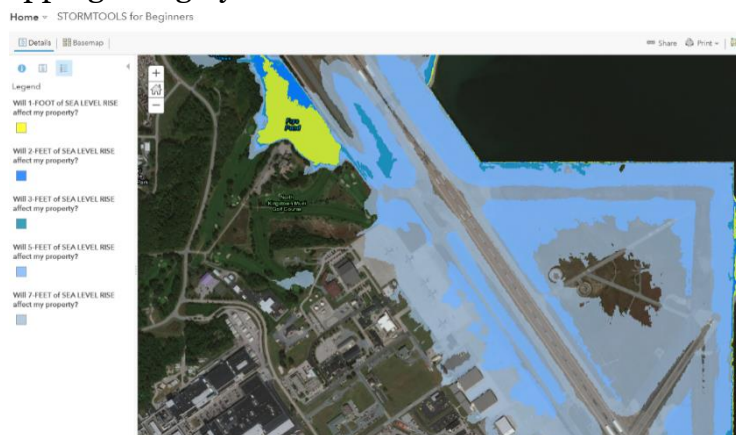
Planning for Future Flooding Along Lake Superior in Minnesota

[The Minnesota Lake Superior Coastal Program](#) enabled the city of Two Harbors to make significant investments in smart stormwater planning. Through three grants from the Coastal

Program, Two Harbors developed a strategy for lessening watershed runoff that had caused flooding, water pollution, property damage, erosion, and unsafe roads.¹⁶ After developing this strategy, Two Harbors constructed three large basins to hold stormwater along with two stream bank stabilization projects and a rain garden. These stormwater planning efforts enabled Two Harbors to avoid major damage in October 2018 when a fierce storm hit and devastated other nearby Lake Superior towns causing \$18.4 million dollars in infrastructure damage.

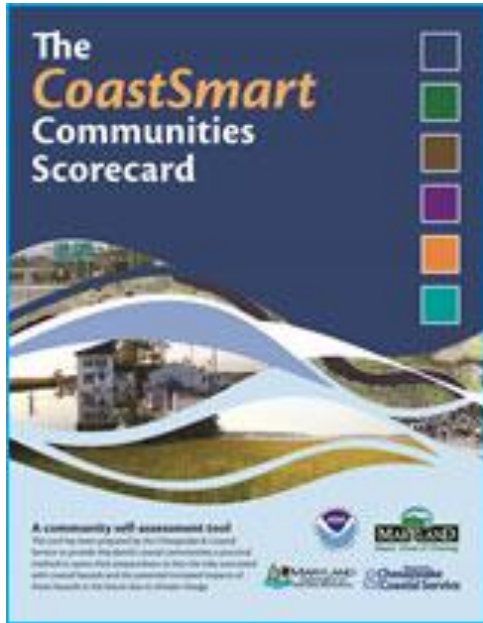
Providing Tools to Empower Rhode Island Citizens and Communities to Prepare for Future Hazards

The [Rhode Island Coastal Resources Management Council](#) (CRMC) provides a suite of data and resources to state residents and coastal communities through [STORMTOOLS](#), a service developed as part of the Shoreline Change Special Area Management Plan (Beach SAMP). Using funding under a CZMA § 309 Strategy and PSM, CRMC has developed quantitative, statewide mapping of highly vulnerable areas and created a Coastal Environmental Risk Index to illustrate the overall future vulnerability of the coastline from the predictable and identifiable risks of coastal erosion, storm surge, wave action, and sea level rise. These resources, along with technical assistance to municipalities to improve codes and ordinances, are provided through a web portal and through



¹⁶ NOAA Office for Coastal Management, *Flood-Control Investments Bring Big Returns*, <https://coast.noaa.gov/states/stories/flood-control-investments-bring-big-returns.html>.

in-person trainings. CRMC also works with trade associations and the insurance industry to incentivize hazard mitigation techniques in private home construction, repair, and renovation projects. The forward-looking Beach SAMP works hand-in-hand with other CRMC Special Area Management Plans, including the Rhode Island Ocean Special Area Management Plan (Ocean SAMP), the nation’s first state ocean plan to encompass federal waters. The innovative Ocean SAMP provides a predictable permitting pathway for new ocean uses, while being considerate of and blending with existing uses of Rhode Island’s ocean waters.



Supporting Chesapeake Bay Communities to Spread Awareness and Plan for Flooding Events

In order to protect the many Chesapeake Bay communities that are barely seven feet above sea level, the CoastSmart Communities Grant Program,¹⁷ a program within the [Maryland Department of Natural Resources’ Chesapeake and Coastal Service](#), delivers mapping data, risk assessments, technical know-how, and trainings to communities in need of protection from severe weather events.¹⁸ The CoastSmart Communities Program provides financial assistance through Outcome 2 of Maryland’s [Chesapeake & Coastal Grants Gateway](#), which is administered by the Maryland Department of Natural Resources Chesapeake and Coastal Service through the national CZM program and has provided over \$1.6

million in grants to 23 coastal communities. The money provided to these communities has been used to strengthen local flood and hazard mitigation techniques as well as provide training on how to build green infrastructure techniques that restore floodplains and strengthen the shoreline. The Program also leads local projects that raise awareness in nearby communities. This outreach has prompted many of these communities to update their floodplain regulations and flood management plans as well as encouraging many Maryland departments to update and incorporate hazard mitigation techniques into their guidelines.

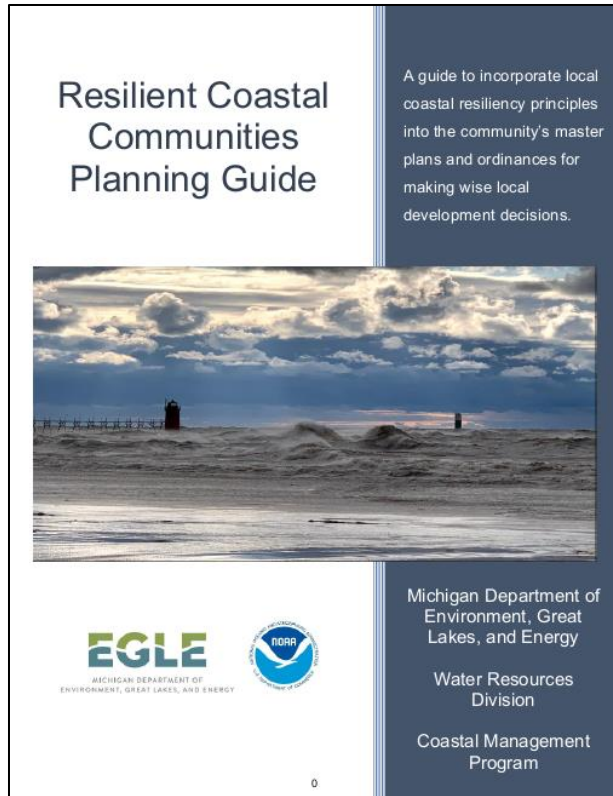
Building a Pathway to Resilience on Michigan’s Coastline

Michigan’s coastal communities are on the front lines of facing the “perfect storm” from seasonal fluctuating Great Lakes water levels, coastal erosion and flooding, stormwater, and urban heat which are all influenced by climate change. The [Michigan Coastal Management Program](#) (MCMP) has devised a [Pathway to Resilience](#) to assist coastal communities through outreach, guidance, training, and grants.

¹⁷ Maryland Department of Natural Resources, *CoastSmart Communities*, <https://dnr.maryland.gov/ccs/coastsmart/Pages/default.aspx>.

¹⁸ NOAA Office for Coastal Management, *Coast Smart Program Cuts Hazard Risks for Communities*, <https://coast.noaa.gov/states/stories/coastsmart-communities-reduce-vulnerabilities.html>.

The [Building Coastal Resilience Series](#) breaks down the Pathway to Resilience over six-videos to help increase the knowledge of coastal process, the impacts of fluctuating water levels and changing climate, data tools, and adaptation strategies to stress the importance of reducing coastal hazards risk. The MCMP's "[Resilient Coastal Communities Planning Guide](#)" was developed to provide guidance to community decision-makers on scenario-based planning methodology for improving community preparedness. Combined, the videos and Planning Guide lay out the foundation for our Coastal Leadership Academy (CLA) training program. The CLA was launched as a pilot program in 2019, and to date, 21 coastal communities have been represented. The Planning and Zoning module is designed to increase knowledge on coastal risks by walking through examples and methods for resilience planning and concludes with each community committing to one action to work towards resilience. In this coming year, the MCMP is expanding the CLA's training program with a module focused on nature-based solutions and strategies communities can implement to manage coastal hazards.



Finally, the MCMP is committed to providing significant technical and financial support to our coastal communities through an annual grant funding opportunity. The goal of all these tools is to empower communities with the knowledge and capacity funding to effectively prepare and respond in a way that results in the protection, preservation, and wise development of our coastal areas.

Developing a Statewide Texas Resilience Master Plan

The [Texas General Land Office](#) (GLO) Coastal Management Program led a state-wide effort to develop the Texas Coastal Resiliency Master Plan in 2017. In 2019, the GLO updated the [Resiliency Master Plan](#) which aims to build on the 2017 version with a broader scope to address the natural and built environments in a more holistic manner. The Texas coast is critical to the Blue Economy, with a population of 6.7 million, bustling ports, military installations, 25% of the nation's identified natural gas resources, 30% of the nation's crude oil refining capacity, and most of the nation's strategic petroleum reserve.¹⁹ The Resiliency Plan identifies high priority projects that focus on protecting coastal infrastructure and natural resources while also incorporating

¹⁹ Texas General Land Office, *2019 Coastal Master Plan*, <https://coastalstudy.texas.gov/resources/files/2019-coastal-master-plan.pdf>.

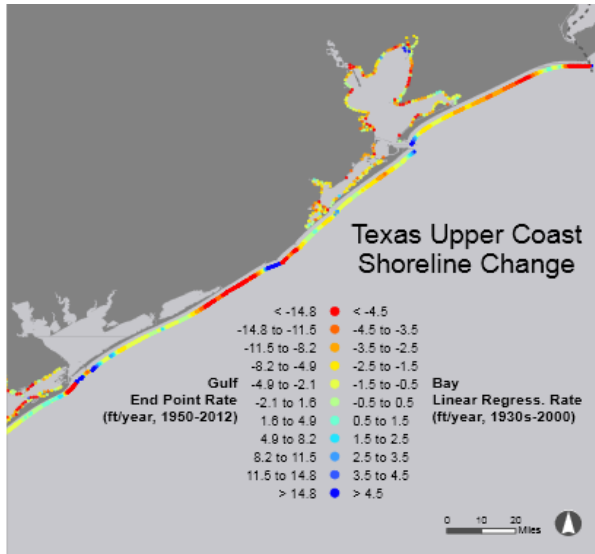


Figure 4.7: Texas Upper Coast Shoreline Change^{91,113}

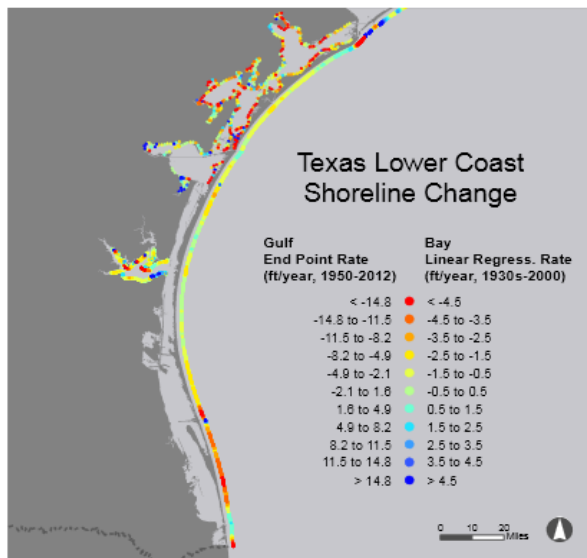


Figure 4.8: Texas Lower Coast Shoreline Change^{91,113}

the most recent storm surge and sea level rise models to identify the needs and benefits of the project. The identification of these projects then allows Texas to work with the U.S. Army Corps of Engineers to construct projects ensure state and federal actions are consistent with the goals and policies of the program. Overall, the Master Plan aims to create resilient communities along the Texas coast that are able to identify the methods needed to increase resiliency and mitigate the negative impact of natural disasters and environmental degradation issues. The Master Plan recommends 123 high priority projects that address the majority of high priority needs identified by data gathering and modeling done by the GLO Planning team.²⁰ After such projects are identified, the Texas Coastal Management Program (CMP) then can carry out identified projects with the \$2.2 million grants it receives from the GLO annually, most of which goes to state and local entities to implement the identified activities.²¹

²⁰ Texas General Land Office, *2019 Coastal Master Plan Overview*, <https://coastalstudy.texas.gov/resources/files/2019-coastal-master-plan-overview.pdf>.

²¹ Texas General Land Office, *Coastal Management Program Grant Projects*, <https://www.glo.texas.gov/coast/grant-projects/cmp/>.

Living Resources

CZM Programs are essential to the effective conservation of vital living resources found along our coasts that are ingrained within the livelihoods of coastal communities. Through prudent management of coastal development and careful implementation of conservation efforts, CZM Programs help protect vulnerable ecosystems while helping local economies thrive. CZM Programs work with industry to plan and site innovative aquaculture projects, sustain offshore fisheries, conserve coral reefs, protect local communities, promote habitat rehabilitation, and many other projects that require CZM coordination across sectors, including:

CZM Restores Resources

Between 2011 and 2021, the State and Territory CZM Programs restored or protected **over 121,000 acres** of coastal habitat, sustaining the natural systems that support coastal communities and the Blue Economy.²²

Collaborating to Develop Science-Based Planning Tools for Aquaculture in Washington

Since 2011, the [Washington's Coastal Zone Management Program](#) has partnered with local government members, the shellfish aquaculture industry, the federal government, local Tribes, and non-government entities on the Washington Shellfish Initiative.²³ Washington's goal under this Initiative was to clean up thousands of acres of shellfish beds that were closed due to pollution and begin advancements in ocean acidification monitoring. Since beginning this project in 2011, the State of Washington has successfully reopened 2,429 acres of shellfish beds, restored native shellfish hatcheries, streamlined the shellfish aquaculture permitting process, reduced pollution, and addressed ocean acidification in Washington's marine waters.²⁴ In 2016, the Initiative launched Phase II of the Initiative which aims to build on these successes. Phase II introduced new goals such as ensuring clean water for shellfish production, addressing ocean acidification impacts on shellfish, advancing vital research, continued improvements to the permitting process, restoring native Olympia oysters and pinto abalone, and educating and engaging the public on shellfish resources and protecting water quality.²⁵

Enhancing Lake Erie Ecology and Economy in Ohio's Sandusky Bay

In response to urban and agricultural runoff entering Ohio's Sandusky Bay in Lake Erie, the [Sandusky Bay Initiative](#) was created to help combat degrading water quality and harmful algal blooms which threatened the health of nearby residents and local aquatic

²² NOAA Office for Coastal Management, *Performance Management Data*.

²³ Washington Shellfish Initiative, <https://www.governor.wa.gov/sites/default/files/WSI%20factsheet.pdf>

²⁴ Governor Jay Inslee, *Gov. Inslee's Shellfish Initiative*, <https://www.governor.wa.gov/issues/issues/energy-environment/shellfish>.

²⁵ NOAA Fisheries, *Washington Shellfish Initiative*, <https://www.fisheries.noaa.gov/west-coast/aquaculture/washington-shellfish-initiative>.



inhabitants. The Sandusky Bay Initiative, coordinated by the [Ohio Coastal Management Program](#), is transforming 64 miles of open water within the Sandusky Bay into a cleaner resource.²⁶ In doing so, the Sandusky Bay Initiative is expanding fish and wildlife habitat to improve water quality, which in turn will not only restore the Bay’s natural ecology but will enhance tourism in the region. One key innovation being used as part of

this Initiative to clean up the Bay and Lake Erie is the reuse of dredge material from federal navigation channels that was traditionally placed into the open waters of Lake Erie. Instead of being dumped, dredge material is now being reused to create new wetlands which create both a filter for nutrient runoff entering the Bay and provide suitable new habitat for local fish and wildlife species.²⁷ This dual benefit of these new wetlands promotes natural habitat growth and the improvement of the water quality of Sandusky Bay, leading to a healthier and more attractive environmental for locals and visitors alike.

Partnering to Cleanup Marine Debris from Florida’s Beaches

[The Florida Coastal Management Program](#)’s Coastal Partnership Initiative (CPI)²⁸ supports local governments with a wide variety of projects to build resilient coastal communities, promote coastal resource stewardship, promote access to coastal resources, and to support working waterfronts. Through CPI, the CZM Program worked with Sea Turtle Adventures and the City of Boynton Beach to



²⁶ NOAA Office for Coastal Management, *Ohio Efforts Enhance Lake Erie Ecology and Economy*, <https://coast.noaa.gov/states/stories/sandusky-bay-initiative.html>.

²⁷ Great Lakes Now, *Sandusky Bay Initiative: Ohio DNR Plans Massive Multi-Project Initiative to Transform the Bay’s Waters*, <https://www.greatlakesnow.org/2019/06/sandusky-bay-initiative-ohio-dnr-plans-massive-multi-project-initiative-to-transform-the-bays-waters/>.

²⁸Florida’s Coastal Partnership Initiative, <https://fdep.maps.arcgis.com/apps/MapJournal/index.html?appid=e37794d6b9d447f69107476a02193e4a&webmap=710e7a5f79c14382a30e0aaaab785d2a>.

conduct a series of coastal cleanups to remove marine debris from critical mangrove habitats at four city-managed parks. This project was also aimed at educating adults with special needs on the importance and sensitivity of coastal resources, specifically mangrove habitats. Sea turtles forage in mangrove habitats and marine debris is both an entanglement threat and an ingestion threat to the numerous endangered sea turtle populations. Through this project, a total of 60 education and cleanup events were held, and almost 750 total volunteers were able to remove 2,762 pounds of debris from 44 miles of shoreline within the City of Boynton Beach.

Creating “Use Local” Policies to Reuse Dredge Material for Beneficial Use in Mississippi

The [Mississippi Coastal Management Program](#) is coordinating a multi-agency effort to reuse dredged sediment for restoration projects that boost coastal storm resilience. In order to improve local living resources and protect coastal communities, Mississippi created a “use local” policy which, according to Mississippi statute, mandates that sediment from dredging projects over 2,500 cubic yards be used in accordance with the state’s “beneficial-use” program. This program, which was permitted with CZMA §306 funding, prevents the placement of dredge material into landfills and the ocean and instructs that the sediment be used at a beneficial-use site so long as the sediment is suitable for that region. In 2016, the uninhabited bird rookery of Round Island benefited from this program by receiving 2.5 million cubic yards of dredged sediment which was used to restore nearly 220 acres of sand and beach habitat.²⁹ As a result, biologists found that the rookery has grown to one of the state’s largest, with more than 3,000 nests and seven shorebird species, thanks to the newly recycled dredged sediment. The restored Round Island withstood 2017’s Tropical Storm Cindy due to new seven-foot-tall berms and provides erosion and flooding protection for nearby Pascagoula. The now thriving Round Island is planned to become an outdoor recreational area, allowing visitors to see first-hand the success of this “use local” policy.



Cleaning Up the Saipan Lagoon and Protecting Valuable Wetlands On the Mariana Islands

The [Commonwealth of the Northern Mariana Islands’ \(CNMI\) Coastal Resource Management Program](#) is leading numerous projects aimed at protecting and cleaning up their valuable island resources. One such project focuses on the reef-

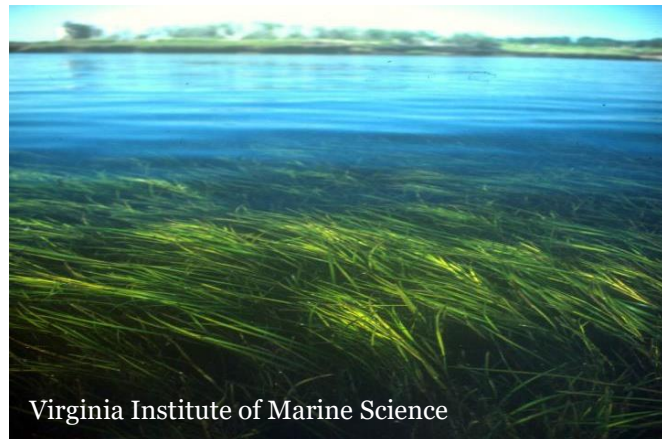
²⁹ NOAA Office for Coastal Management, ‘Use-Local’ Sediment Policies Bring Resilience and Industry Bonuses, <https://coast.noaa.gov/states/stories/sediment-policies-bring-resilience-and-industry-bonuses.html>.

fringed Saipan Lagoon. Saipan lagoon attracts roughly half a million tourists each year, however, dangerous runoff from nearby urban watersheds threatens the overall reef health and water quality.³⁰ To combat the deteriorating water quality and to protect coral reefs, a new stormwater filtration system was created that cut down on the amount of stormwater runoff able to enter the lagoon. By limiting the amount of runoff entering the lagoon, the CNMI Coastal Program was able to successfully improve water quality and protect Saipan's reefs for locals and tourists to continue to visit safely, providing a clean and clear lagoon for swimmers, snorkelers, and divers while also protecting the reefs.

Additionally, CNMI's Coastal Program is currently developing a plan to address a problem where tourists at the popular Jeffery's Beach are driving their vehicles over and destroying a fragile dune and estuarine ecosystem. This ecosystem is home to rare species like the goby and rock flagtail fish which are not found elsewhere in the Commonwealth.³¹ To protect this valuable habitat and tourist destination, the CNMI Coastal Program utilized CZMA §306 funding to initiate the planning phase of the project and partnered with the U.S. Army Corps of Engineers and others to design a 250-foot boardwalk from the designated parking lot to the beach to allow visitors to safely access the beach without destroying this rare ecosystem in the process. The project is currently underway with plans for completion in the near future.

Supporting Mid-Atlantic Fisheries with the World's Largest and Most Successful Eelgrass Restoration Project in Virginia

The [Virginia Coastal Management Program](#) partnered with the Virginia Institute of Marine Science (VIMS) and others to restore aquatic resources on the Seaside of Virginia's Eastern Shore in an effort that is now the largest and most successful eelgrass restoration project in the world. The project team has strategically distributed over 71 million eelgrass seeds since 2000. Those seeds have since grown to cover over 9,000 acres where there had been none since the 1930s when hurricanes and an eelgrass disease wiped out a crucial portion of Virginia eelgrass beds.³² These eelgrass



³⁰ NOAA Office for Coastal Management, *Filtration System Keeps Saipan Lagoon Cleaner*, <https://coast.noaa.gov/states/stories/filtration-system-keeps-saipan-lagoon-cleaner.html>.

³¹ NOAA Office for Coastal Management, *Accessible Boardwalk Will Promote Habitat Protection and Education*, <https://coast.noaa.gov/states/stories/accessible-boardwalk-will-promote-habitat-protection.html>.

³² NOAA Office for Coastal Management, 2020, *Virginia Features World's Most Successful Eelgrass Restoration Project*. <https://coast.noaa.gov/states/stories/worlds-most-successful-eelgrass-restoration-project.html>.

beds provide critical habitat for commercially important juvenile fish such as menhaden, herring, shad, spot, croaker, weakfish, red drum, and silver perch, as well as blue crabs. They also improve coastal water quality by absorbing nutrients and trapping fine sediments, sequestering CO₂, and protecting shorelines from erosion by absorbing wave energy. Additionally, the CZM program worked with VIMS and others to reintroduce bay scallops into the eelgrass beds. Over 200,000 bay scallops have been reared to maturity and the wild population is now estimated at over 78,000. These natural resources are critical to the economies of the Eastern Shore's rural coastal communities.

Tourism and Recreation

State and Territory CZM Programs provide funding, planning support, technical assistance, and critical interagency coordination services for coastal communities to bolster the thriving tourism sector, improve public access, restore natural coastal systems, and plan for multiple uses of coastal resources. Each State and Territory balances consumptive use with conservation of the unique coastal features that sustain the nation’s critical tourism industry. Some of the key roles CZM Programs play in the Tourism and Recreation sector include:

CZM Creates Access

Between 2011 and 2021, the State and Territory CZM Programs created or enhanced **more than 3,200 public access sites** to support coastal recreation and tourism.³³

California Expands Public Access to the Coasts

The three agencies that make up the California Coastal Management Program—the [California State Coastal Conservancy](#) (CSCC), the [California Coastal Commission](#) (CCC), and the [San Francisco Bay Conservation and Development Commission](#) (BCDC)—prioritize building access to the State’s 840 miles of coastline. The agencies implemented a wide range of coastal access projects which support coastal recreation and tourism. Recreation at California’s beaches generates over \$13 billion annually while beach tourism generates over \$93 billion annually. A few project highlights include:



CSCC has led the development of the California Coastal Trail, an integrated network of biking and walking trails extending along California’s coast.³⁴ The California Coastal Trail connects to the San Francisco Bay Trail developed by BCDC.³⁵ Together these trails provide more than 1,000 miles of public access to the coasts. BCDC has built off of the Bay Trail a Bay Water Trail which is a growing network of non-motorized boat launch and landing sites which offer a wide range of historic, scenic, cultural, and environmental excursions.³⁶

CSCC has also invested in public access for people with disabilities, providing manual and motorized beach wheelchairs. While the CCC has developed mapping tools and mobile applications to help the public find and learn more about the more than 1,500 public access points and 108 locations with beach wheelchairs.

³³ NOAA Office for Coastal Management, *Performance Management Data*.

³⁴ California Coastal Trail, <https://scc.ca.gov/projects/california-coastal-trail/>.

³⁵ San Francisco Bay Trail, <https://mtc.ca.gov/operations/regional-trails-parks/san-francisco-bay-trail>.

³⁶ San Francisco Bay Area Water Trail, <http://sfbaywatertrail.org/>.



Schuylkill River Development Corporation

Designing a Multi-Use Trail Expansion Contributes to Urban Revitalization and Commercial Growth in Philadelphia

The Pennsylvania Coastal Resource Management Program supported the Schuylkill River Development Corporation effort to plan for an extension of the Schuylkill Banks multi-use trail, creating a final link for

pedestrians and cyclists to off-road recreation.³⁷ The Schuylkill Banks connects historic landmarks and communities along the Philadelphia waterfront. The CZM Program provided support to assist with planning a challenging segment that transverses a dense urban area and abandoned infrastructure and extends over waterways to connect diverse and low-income neighborhoods. The completed Schuylkill waterfront revitalization effort is projected to result in a \$772 million economic benefit for the construction effort alone while nearby property values are projected to increase by fifteen to thirty percent. Additionally, the NOAA supported expansion is expected to promote accessibility, recreation, job opportunities, and economic development in diverse and low-income communities.³⁸

Cleanup and Revitalization Effort in Waukegan Harbor, Illinois Creates a Recreational and Cultural Hub

The [Illinois Coastal Management Program](#) worked with the City of Waukegan and the Waukegan Port District on a large-scale effort to clean up the contaminated harbor and revitalized underused lakefront spaces.³⁹ The U.S. Environmental Protection Agency led the decontamination of the harbor while the CZM program works with the agency to monitor the clean-up areas. The CZM Program also provided technical assistance with lakefront, port district, sustainable shoreline, and dune management efforts. The planning efforts included changing local ordinances to allow food trucks and planning for residential, retail, recreational, and working-waterfront components. The lakefront area is also connected to the Lake Michigan Water Trail—a 1,638 mile water trail providing a recreational paddling experience—with an Americans with Disabilities Act (ADA) accessible canoe and kayak launch. These investment attracted the development of a \$5 million new Bay Marine Chicago Yachting Center on the lakefront. The revitalized area now host nearly 135 public events each year ranging from beach yoga

³⁷ NOAA Office for Coastal Management, *Trail Extension to Benefit Philly's Walkers and Cyclists*, <https://coast.noaa.gov/states/stories/trail-extension-benefits-walkers-and-cyclists.html>.

³⁸ Schuylkill River Development Corporation, *The Potential Economic Impacts of the Completed Expansion of Schuylkill Banks*, <https://www.schuylkillbanks.org/sites/default/files/attachments/Economic%20Impact%20of%20Schuylkill%20Banks%202017.pdf>.

³⁹ NOAA Office for Coastal Management, *Waukegan's Harbor Cleanup Revitalizes City Scene*, <https://coast.noaa.gov/states/stories/waukegan-harbor-cleanup-revitalizes-city.html>.

classes to concerts. Additionally, the city now host fifteen festivals annually attracting more than 250,000 people and supporting local businesses.

Puerto Rico Creates Hiking Trails for the Vision Impaired

Tourism and recreation are the biggest contributors to the blue economy in Puerto Rico with more than 62,000 people employed and \$7.4 billion direct and indirect impact for the Territory. To promote tourism and recreation opportunities for people with disabilities, the Program [Puerto Rico Coastal Zone Management Program](#) developed a public access trail at the Punta Tuna Nature Reserve with enhanced features for people with disabilities. The trail was designed with smartphone-scannable codes as well as audio stations to enable visually impaired visitors to listen to information about the Reserve. In addition, the trail is equipped with trail-adapted wheelchairs.

Marine Commerce and Transportation

CZM Programs ensure that the national policy of prioritizing ocean-dependent uses and the Blue Economy is implemented in state and local policy. Communities and the private sector rely on these programs to protect and support the cultural and economic value of marine-dependent industries including energy development, fisheries, and ocean transportation of commercial goods. CZM Programs also provide a vital bridge between national ocean science programs and the local ports, marinas, and coastal economies that depend on them, ensuring that coastal communities have a voice in national marine policy. Some of the critical work CZM Programs perform in the marine commerce space includes:

CZM Creates Access

Between 2008 and 2019, **495 communities** conducted port and waterfront redevelopment efforts, with assistance from State or Territory CZM funding or technical assistance.⁴⁰

Revitalizing an Urban Working Waterfront and Creating New Recreation Spaces

The [New York Coastal Zone Management Program](#), administered by the New York Department of State, Office of Planning Development and Community Infrastructure, leads a Local Waterfront Revitalization Program that partners with waterfront communities across the state to provide redevelopment for underutilized waterfronts while also addressing waterway issues, improving water quality and natural areas, protecting sensitive resources, promoting public access, and ensuring adequate infrastructure. One of the projects implemented under this program was revitalization of the Port of Rochester Marina—a former waterfront industrial and shipping site turned parking lot—transforming it into a vibrant commercial waterfront and recreation and tourism destination.⁴¹ Rochester’s location as one of the first ports of call in the United States for ships coming down the St. Lawrence Seaway from the ocean has driven the economic development of the waterfront but over the decades port uses have shifted from primarily industrial to recreational. To meet the need for additional boating, fishing, and recreational amenities, the New York CZM Program provided funding and technical assistance to use underutilized space by creating a modern marina with a public promenade, green spaces, a coastal overlook, and fishing access which all connect to other recreational destinations including the Charlotte Pier and the Genesee River Trail System. The marina created 300 permanent jobs and generates \$3.25 million in direct and indirect economic activity annually.⁴²

Preserving the History of One of the Oldest Working Waterfronts in the Pacific Northwest

The [Washington Coastal Zone Management Program](#) worked with the City of Gig Harbor to preserve the city’s historic working waterfronts. Gig Harbor is home to one of the earliest fishermen settlements in the Pacific Northwest and has a significant

⁴⁰ NOAA Office for Coastal Management, *Performance Management Data*.

⁴¹ New York Department of State, *Rochester: Reclaiming Underutilized Public Spaces*, <https://dos.ny.gov/rochester-reclaiming-underutilized-public-spaces>.

⁴² NOAA Office for Coastal Management, Grant Helps Turn Rochester Lot into Great Lakes Tourism Destination, <https://coast.noaa.gov/states/stories/grant-helps-turn-rochester-lot-into-great-lakes-tourism-destination.html>.

concentration of historic maritime uses and structures which contribute to the community's rich maritime culture and identity. Increasing community growth and shifts in economies from maritime to recreation and tourism threatened the continuation of the communities working waterfronts. To address these challenges, the CZM Program and the city worked together to create a Historic Working Waterfront Designation as part of the State's Shoreline Management Plan.⁴³ This designation recognizes the importance of the historic commercial fishing and boatbuilding industries in the city and allows for preservation and rehabilitation of historic structures alongside the existing active fishing fleets. The restoration of these structures helps to promote the areas heritage tourism.

Securing the Economic Vitality of Virginia's Working Waterfronts

The [Virginia Coastal Zone Management Program](#) in collaboration with private sector stakeholders developed a working waterfront master plan.⁴⁴ This collaboration led to the passage of several bills that support working waterfronts through waterway maintenance financing and fast-tracking permits for special dredging projects. Cities and counties are also using the plan information to bolster their comprehensive plans and designate zones for working waterfronts. Virginia's

600 working waterfronts represented the third-largest producer of marine products in the nation and accounted for a gross domestic product of \$8.5 billion while employing 122,000 workers. Virginia's master plan addressed threats to long-term viability of working waterfronts including: an aging workforce, competition for waterfront land, problems with water quality and water access, and more frequent



Larry Chowning

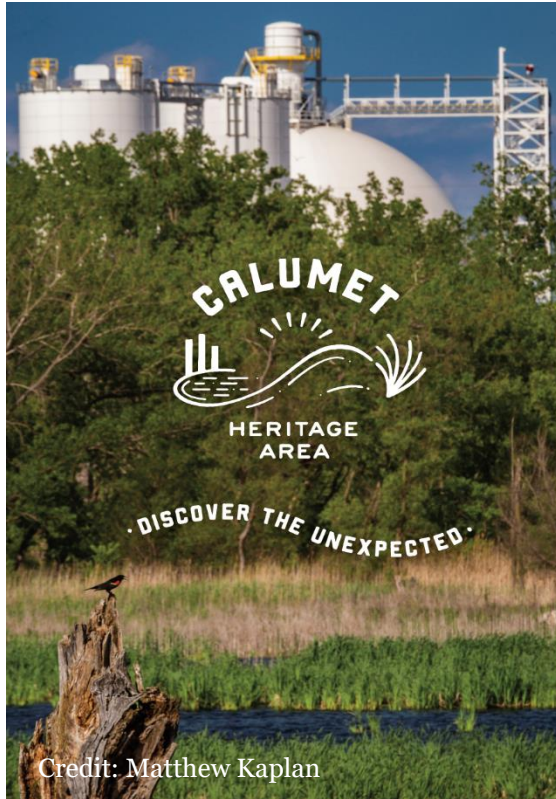
and severe floods and storms. The work of the CZM program ensures a high return on investment and protects the long-term economic sustainability of the area while preserving the cultural heritage of the maritime industry.

Building a Vibrant Working Waterfront by Tapping Into Industrial Heritage

The [Illinois Coastal Management Program](#) co-provided leadership and funding for Millennium Reserve Initiative which in 2018 evolved into a nonprofit organization, the [Calumet Collaborative](#). The Collaborative brings in the [Indiana's Lake Michigan Coastal Program](#) as well as a wide suite of local, nonprofit, and industry partners in an effort to

⁴³ National Working Waterfront Network, *Case Study: Gig Harbor's Historic Working Waterfront*, https://nationalworkingwaterfronts.com/portfolio_page/case-study-gig-harbors-historic-working-waterfront/.

⁴⁴ NOAA Office for Coastal Management, *Plan and Legislation Secure Economic Vitality of Working Waterfronts*, <https://coast.noaa.gov/states/stories/master-plan-secures-economic-vitality-of-working-waterfronts.html>.



revitalize the bi-state Calumet industrial region. The region includes a network of transportation assets including ports, rails, and highways across 91 counties, cities, towns, and villages including the Illinois International Port District which moves more cargo than any other on the Great Lakes; through shipping alone, it moves 19 million tons annually. The revitalization initiative is multifaceted with the improvements to port infrastructure and administration, restoration of coastal wetlands habitat, brownfield remediation and redevelopment, the conversion of an obsolete rail line into multiuse trails, the installation of an American with Disabilities Act compliant kayak landing, connecting the corridor with the Pullman National Monument in Illinois and the Indiana Dunes National Lakeshore.⁴⁵ The Collaborative seeks to do all of this while ensuring climate resilience and equity and empowering local communities.⁴⁶

⁴⁵ NOAA Office for Coastal Management, *Illinois Boosts Ecology, Community Along Lake Michigan Industrial Corridor*, <https://coast.noaa.gov/states/stories/illinois-boosts-ecology.html>.

⁴⁶ Calumet Collaborative, <http://www.calumetcollaborative.org/mission--vision.html>.

New Blue Economy

The New Blue Economy focuses on how ocean and coastal observations, data, predictive models, and tools are driving economic opportunities by stimulating innovation and growth. The State and Territory CZM Programs play four key roles in the New Blue Economy—(1) they deploy ocean and coastal observation infrastructure and assets, (2) they are producers of ocean and coastal observation data, (3) they tailor ocean and coastal data into various models and tools, and (4) they are end users with ocean and coastal data needs to inform coastal management decision making with directs on coastal economies. Ways that the CZM Programs are engaging in the New Blue Economy include:



Steve Helber, AP

Promoting Offshore Wind and Lessening Ocean-Use Conflicts in Virginia

For more than a decade, the [Virginia Coastal Zone Management Program](#) has been assisting multiple sectors of ocean and coastal users to identify and address conflicting uses.⁴⁷ The Virginia CZM Program initiated the development of a data portal

from 2009-2011 which is now supported by the Mid-Atlantic Regional Council on the Ocean.⁴⁸ The data portal enables people to view maps of fisheries, marine wildlife, shipping channels, and other ocean features. This tool assisted stakeholders in documenting existing uses and identifying and resolving concerns in the siting process for the Coastal Virginia Offshore Wind project and has been a critical tool in allowing stakeholders to collaborate and respond to BOEM requests for public comment on the draft Central Atlantic Call Area.⁴⁹ In addition, the CZM Program supported a coordinator to engage with commercial and recreational fishing communities to address their concerns. The Virginia CZM Program evaluated the project for consistency with the State Program and also sits on the Virginia Offshore Wind Development Authority to help facilitate the development of offshore wind in the State. The Coastal Virginia Offshore Wind project will be the nation's largest offshore wind facility and will power up to 660,000 homes.

Eye in the Sky Monitors Resource Threats in the Commonwealth of the Northern Mariana Islands

The [Commonwealth of the Northern Mariana Islands Coastal Resources Management \(CNMI\) Program](#) is using advanced technology to better inform its coastal management

⁴⁷ NOAA Office for Coastal Management, *Program's Leadership and Data Maps Lessen Ocean-Use Conflicts*, <https://coast.noaa.gov/states/stories/programs-leadership-and-data-maps-lessen-ocean-use-conflicts.html>.

⁴⁸ Mid-Atlantic Ocean Data Portal, <https://portal.midatlanticocean.org/>.

⁴⁹ Dominion Energy, <https://coastalvawind.com/>.

initiatives. There has been a large growth in tourism in CNMI which have resulted in increasing threats to coastal resources, but also drives the need to ensure ecological vitality. The CZM Program, together with NOAA, the CNMI Coral Reef Initiative, the CNMI Division of Environmental Quality, and the CNMI Division of Fish and Wildlife, is using an unmanned aerial vehicle to survey the Territory's coasts to identify coastal threats such as increases in stormwater runoff or areas where there is coastal erosion.

Improving Safety for Coastal Recreation with Observations

The sea caves at Apostle Island National Lakeshore draw thousands of kayakers annually driving a local tourism economy. But until recently, kayakers had no way to know when the waves around the caves were dangerous or not until they got out there, posing a threat to the safety and lives of these kayakers. To address this issue, the [Wisconsin Coastal Management Program](#) partnered with the University of Wisconsin-Madison, the National Park Service, and the Friends of Apostle Island to design and install a



Real Time Wave Observation System. The system includes buoys and real-time camera observations which are available online as well as at the kayak launch-site kiosk. The system provides kayakers and the National Park Service with up-to-the-minute sea cave conditions. The system also operates year-round providing a robust data set of wave and ice conditions in the region.

Crowdsourced Data Informs Coastal Decision-Making

The [South Carolina Coastal Zone Management Program](#) developed the [MyCoast mobile application](#) which enables coastal users to be citizen scientists and contribute to long-term data collection on King Tides, coastal storms, abandoned vessels, and beach cleanups along South Carolina's Coasts.⁵⁰ The photos taken by citizen scientists are evaluated and incorporated into long-term analyses of coastal vulnerabilities. The data contributes to scientific knowledge on coastal impacts in South Carolina and have been incorporated into numerous publications. The data and analysis are also used to inform coastal planning and decision-making.⁵¹

⁵⁰ NOAA Office for Coastal Management, *NOAA Cheers Citizen Scientists*, <https://coast.noaa.gov/states/stories/citizen-science.html>.

⁵¹ SciStarter, *South Carolina MyCoast*, <https://scistarter.org/south-carolina-mycoast>; South Carolina Aquarium, *King Tides Initiative*, <https://scaquarium.org/king-tides-initiative/>.

Conclusion

Conclusion

The examples shared here provide a snapshot of the diversity of activities that State and Territory CZM Programs implement across the nation to support the Blue Economy. Though State and Territory economies and environments vary widely state-to-state and region-to-region, States and Territories have developed the coastal management strategies that work best for them, and in turn advance national coastal management priorities and enhance the Blue Economy.

Investments in CZM Programs through Coastal Zone Management grants and support for the technical assistance provided by the National CZM Program are investments in the nation's Blue Economy.

The CZM Programs match federal funding for Coastal Zone Management Grants nearly dollar-for-dollar, amplifying the benefits of federal investments in coastal zone management. Robust investments are necessary to ensure sustainable management of the coastal zone and to continue to build and maintain a vibrant Blue Economy for today and for future generations.



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