

STATE OF THE BEACH REPORT CARD

2018



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INTRODUCTION

America's coastlines are as diverse as its people. From rocky outcrops on the West Coast and sugar sand beaches in the Gulf of Mexico and Florida, to the expansive waters of the Great Lakes and the barrier islands and bays of the North and Mid-Atlantic, these special places support communities, unique ecosystems and fuel local economies. However, beaches are disappearing at an alarming rate, due to both natural processes and human interference. Coastal erosion poses ecological issues, as well as economic impacts, which have already led to [\\$500 million](#) in U.S. property damages annually.

As natural erosion continues to ebb and flow, climate change, sea level rise and extreme weather events are speeding up shoreline erosion at an accelerated rate. In fact, within the past year, scientists have updated sea level rise predictions. Until recently, most scientists agreed a worst-case scenario for sea level rise by 2100 would be about [six feet](#). Now, an [increase](#) of over 10 feet by the end of the century is not out of the question if we do not curb greenhouse gas emissions. While sea level rise will be different across the country due to specific geological conditions, it is clear that preparing for sea level rise and extreme weather events will require much more proactive planning.

Since the year 2000, the Surfrider Foundation has been producing the State of the Beach report as a coastal management resource. The continually updated online report has historically focused on a range of issues, including beach access, surfing, water quality, beach erosion, shoreline structures and beach ecology. As coastal erosion and future sea level rise are increasingly pervasive problems that demand immediate attention, Surfrider developed an additional State of the Beach Report Card in 2017 to highlight and analyze how states are responding to erosion problems, coastal preservation and sea level rise planning.

The updated 2018 State of the Beach Report Card assesses the performance of 31 U.S. coastal and Great Lakes states, and the territory of Puerto Rico, against key beach health indicators that are grouped into four main categories. These indicators provide a lens to evaluate state policies and efforts to protect our nation's beaches from coastal

development, beach fill, sea level rise and shoreline structures. The resulting grades indicate that 74% of states assessed (23 out of 31), are doing a mediocre to poor job of responding to coastal erosion and sea level rise planning, especially in areas that are most impacted by extreme weather events. However, on a positive note, there was an increase in sea level rise planning as 10% of states improved their efforts since 2017.

Outside of the State of the Beach Report Card, a recent study from [Zillow](#) has reported similar findings indicating that many coastal states, particularly New Jersey, are continuing to build in risky areas. In addition to New Jersey, there is a nationwide trend over the past decade where more than half of coastal states continue to build in areas prone to coastal flooding and storm surge.

The State of the Beach Report Card was developed to empower concerned citizens to work with their coastal municipalities to ensure active protection of coastal resources in light of erosion and the increasing effects of our changing climate. The report card also functions as a tool to motivate decision-makers and agencies to implement proactive, long-term solutions that strengthen the resiliency of our coastline, instead of exacerbating coastal erosion by allowing short-sighted reactionary efforts like hard stabilization structures.

The goal of Surfrider's State of the Beach Report Card is to make the public aware of the ever-growing erosion problem facing our beaches and improve how municipalities and agencies respond to erosion, coastal preservation and sea level rise. For more information on the health of our nation's beaches, visit Surfrider's comprehensive State of the Beach [online resource](#).



SURFRIDER'S COASTAL EFFORTS TO IMPROVE MANAGEMENT

The Surfrider Foundation is a nonprofit, environmental organization dedicated to the protection and enjoyment of our world's ocean, waves and beaches. Over the past 34 years, Surfrider has helped to improve coastal management and protect important ocean and coastal resources. With more than 170 chapters and student clubs nationwide, Surfrider is working at local, state and national levels to protect our shorelines on every coast. We proactively address threats, such as coastal development, shoreline armoring, seawalls and beach 'dredge and fill' projects to support the protection of our coasts. On a national level, our environmental policy and legal experts work with decision-makers to plan for the future of our coasts.

Examples of Surfrider's coastal preservation accomplishments from this past year include:

- U.S. State Coastal Management Programs were protected for 2018, despite the Trump administration's proposal to eliminate funding
- California's Gaviota coast was protected from harmful development
- Through the passage of a state law, Hawai'i will go carbon neutral by 2045
- Pacific County, Washington, adopted a shoreline plan to protect coastal resources
- The restoration of Ocean Beach in San Francisco moved forward through the adoption of the Western Shoreline Area Plan
- Ocean bluffs in Encinitas were protected from harmful development as a result of advocacy to the California Coastal Commission
- Surfrider participated as an official delegate at the Global Climate Action Summit, bringing awareness to ocean and coastal issues
- Appellate court upheld a seawall policy in Solana Beach, California

For more information on Surfrider's coastal preservation campaigns and victories, visit surfrider.org. Join your nearest chapter to get connected and involved in the protection of your local coastline and favorite beach!

COASTAL EROSION IS THREATENING BEACHES

Our nation's beaches are under extreme threat from coastal erosion. According to a U.S. Geological Survey, about 50% of surveyed U.S. coastlines are either at 'high' or 'very high' risk of coastal erosion. This alarming statistic underscores the importance of strong coastal management to protect these vital resources for the future.

'Coastal erosion' is the loss of both sandy beaches and land area. It occurs due to several factors, including geologic changes in the landscape, sea level rise, high-intensity storms and loss of natural sand supply. Developments, such as the paving of watersheds, damming of rivers and construction of shoreline structures that interrupt sand transport, block the natural flow of sediment to the coastline and prohibit the natural refurbishment of sand on our coasts. Coastal erosion typically does not pose a noticeable problem until structures become threatened and beaches diminish.

Part of the problem is that the allure of the coasts has prompted individuals and communities to build infrastructure too close to our ocean and waterways. Only after coastal erosion and storm surge threaten properties, many homeowners and land managers conduct expensive protection projects. These short-term approaches include the addition of sand through 'sand replenishment' and the construction of hard stabilization structures with 'coastal armoring.' While applied as a quick-fix, scientists have found that sand replenishment projects can cause environmental damage and unintended ecological consequences, while shoreline armoring actually exacerbates erosion by blocking the natural flow of sand and effectively starving beaches. Additionally, sand is a finite resource, formed from the weathering and erosion of rocks over [thousands to millions of years](#). As the world's demand for sand continues to rise for use during construction (cement and glass), infrastructural developments (asphalt), fracking, and sand replenishment, [the global supply of sand is dwindling](#).



Above: A response team surveying the damage on the flooded streets of New Orleans after Hurricane Katrina in 2005.

To compound these issues related to beach erosion and sand scarcity, more than [80,000 acres of coastal wetlands are lost](#) annually, which is the equivalent of about seven football fields lost during each hour of every day. Over the past 200 years, [more than half of the wetlands](#) in the United States have disappeared due to a combination of natural processes and human engineering. This erosion of coastlines, wetlands and watersheds is also taking place in conjunction with rising sea levels and the ongoing effects of climate change, severely impacting our nation's coasts.

CLIMATE CHANGE AND SEA LEVEL RISE

Climate change is already here. Many empirical examples of climate change impacts can be seen around the country. Areas in [Florida](#) are increasingly experiencing 'sunny day flooding,' in which the ocean regularly creeps into streets and storm drains. In the Pacific [Northwest](#), the shellfish industry has undertaken major efforts to curb acidic ocean water from impacting hatcheries. California witnessed another record-breaking [fire season](#) in 2018. The Atlantic coast was impacted by devastating [hurricanes](#) in 2018 that literally wiped out communities. In fact, an amazing [calculator tool](#), released by the New York Times, illustrates how temperatures have increased over the decades, and visibly plots the trajectory of future temperature increases. It's impressive and alarming at the same time.

In October 2018, the United Nations Intergovernmental Panel on Climate Change released a [report](#) concluding that drastic climate change impacts are now estimated to occur much faster than previously predicted—as soon as 2040. Even if humans manage to keep the Earth's temperature from increasing by two degrees Celsius (the critical number assigned by [scientists](#) to avert dire consequences), major impacts are expected to happen regardless.

As extreme weather events and climate change become more consistent and noticeable, it is increasingly important for our nation's decision-makers to take immediate steps and actively plan for climate change impacts. After destructive environmental disasters, the sentiment is often to rebuild in the same place and begin immediately armoring the coast. However, this approach often leads to overdevelopment of the coast and puts people and homes back in dangerous, high risk areas. Alternatively, through strategic restoration and planning, shorelines can recover and regenerate without increased erosion. Homes can also be built in ways, and locations, that prevent added risk to residents.

We need to proactively and strategically turn the tide now to avoid the loss of beaches, homes, communities, public access, recreation and ecosystems. In terms of coastal erosion, this isn't just about the loss of beaches, it's about the increasing loss of livable land for our communities. Once these unique and special areas are gone, they're gone for good for today and the future.

KEY OUTCOMES



Above: The clear impacts of coastal erosion after Hurricane Irma passed over Florida.

Many states have model programs in place to protect our coastal resources. However, this year's report card reveals once again that the majority of coastal and Great Lakes states are doing a mediocre to poor job of responding to coastal erosion and sea level rise planning. A noticeable trend highlights the fact that states that are the most vulnerable to extreme weather events, including destructive hurricanes, are also the least prepared in terms of state policy to handle coastal erosion and the increasing impacts of climate change.

The overarching results indicate that the majority of coastal managers and state agencies need to take larger steps to ensure our beaches and nation's coastlines will be protected for future generations. This national trend also denotes a clear need for increased federal leadership. While it is evident that states would greatly benefit from more consistent policy and financial support from the federal government, the current administration is rolling back important policies and federal agencies are lacking in leadership and strategic planning.

Given the severity of coastal erosion and impending sea level rise, the State of the Beach Report Card criteria checklist is ambitious and the standards are intentionally set at high levels. The report card is intended to be used as a tool

to highlight areas that need the most work and provide potential solutions that can be implemented to protect our coasts and coastal communities for the future. In order for states to aim for the ambitious standards set in this report, it is important to increase adaptive capacity and look at each of the four areas assessed in a holistic manner.

In addition, states and local municipalities will need to roll up their sleeves and make hard decisions by upgrading building standards. These planning standards must address the risk of increasing sea level rise and the extreme weather we experience now and expect in the future. Policy changes cannot be based on standards from decades ago, when impacts from storms and hurricanes were not as severe. For example, in the wake of Hurricane Michael, Florida is reconsidering [building standards](#), such as ensuring all new development has the capacity to withstand winds up to 175 mph, to be applied to the entire state. In addition, other municipalities such as Imperial Beach in San Diego, are contemplating [relocating infrastructure](#) out of harm's way to help protect public safety, the environment and local taxpayers in the long run.



METHODOLOGY

Surfrider’s State of the Beach Report Card evaluates the performance of states in terms of management of their coastal resources. Erosion responses were analyzed by researching available information from our nation’s Great Lakes and coastal states, in addition to Puerto Rico. Researched information included regulations on state-funded engineering studies, erosion maps and permits granted for development and beach replenishment projects.

Each state or territory was graded on its response to erosion and sea level rise based on a set of twelve criteria separated into four major categories of sediment management, development, coastal armoring and sea level rise (Appendix 1). This set of criteria, which encapsulates state efforts regarding essential policies and management practices, is also consistent with the expectations of the

Coastal Zone Enhancement Program through the federal Coastal Zone Management Act. The states were evaluated on their policies, regulations, planning and implementation based on existing literature, online resources, communication with coastal zone management agencies and Surfrider’s local network. Additional content gathered by each state to assess grades is also [available to view](#) for more in-depth information.

For each category, states received a numerical score from 1 (bad) to 3 (good), based on the presence and strength of their policies. The score for each state was calculated by totaling points from every category and translating scores into letter grades, described in greater detail below. We aimed to provide holistic grading, balancing the point system with the state’s policies overall, including quality of policies and how well they are implemented.

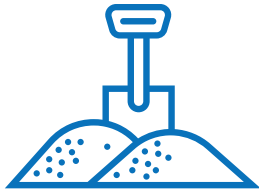
The scoring scale for the four categories is qualitative, based on each state’s ability to meet the key criteria:

The overarching grading scale is a standard five-letter grading system from A to F. However, a few states did receive either a plus (+) or minus (-). This exception was made for only a few states because the grade was marginally on the fence when calculating criteria points. In addition, a minus can indicate that a state has strayed from strong policies that are already in place, and a plus can indicate that while a state is lacking certain criteria, exceptional efforts are being made to improve coastal management.

BAD = 1 POINT	OK = 2 POINTS	GOOD = 3 POINTS
Insufficient. Does not provide adequate protection of coastal resources.	Almost there but not quite enough.	Nice work! Sufficiently protects the coastline.

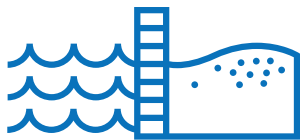
A = 11-12 POINTS	Excellent policies and implementation.
B = 9-10 POINTS	Good, but can be improved.
C = 7-8 POINTS	Mediocre.
D = 5-6 POINTS	Mostly poor, lacking.
F = 4 POINTS	Inadequate protection of coastal communities and resources.

CATEGORIES OF CRITERIA



Sediment Management

Coastal states are encouraged to manage coastal sediment and upland sediment sources to ensure habitat for wildlife and healthy beaches for recreation, tourism and economic opportunity. Adequate sediment management includes protecting and restoring the natural flow of sediment to the coast and along the beach. When necessary, it also includes strategically planning for beach replenishment by establishing clear monitoring requirements before and after sediment projects, and a permitting process to ensure proposed projects meet regional requirements.



Coastal Armoring

As a result of significant coastal development, many states have permitted methods of coastal armoring to protect structures from hazards such as extreme tides, storms and sea level rise. Coastal armoring is a form of 'structural shoreline stabilization' which protects development rather than the coast. This quick-fix approach is intended to reinforce unstable coastlines and create a physical buffer between developments and the waterline. Methods of armoring include the construction of jetties, vertical seawalls, and riprap or revetments, which are large rocks, boulders, or artificial counterparts placed on the beach. Unfortunately, these armoring techniques are costly, provide only short-term protection, result in the loss of natural coastline and actually exacerbate the rate of erosion. Adequate coastal armoring policies prevent the use of hard armoring, restrict inappropriate construction and repair, prevent emergency permitting directly after storms and promote soft stabilization mechanisms that increase coastal resiliency, such as living shorelines that use native vegetation to protect wetlands and coastal areas.



Development

Much of our nation's coastlines are already developed. Waterfront residences, tourism opportunities and public infrastructure, such as roads, wastewater treatment plants and power plants, line our coasts. In addition, coastal development in a time of climate change exacerbates impacts to wildlife, habitats and coastal recreation, which all depend on healthy coasts. Adequate coastal development management includes implementing strong building codes that ensure developments can withstand severe storms, restrictions on the repair or development of new structures in high hazard areas, ample 'setback' buffers away from the coast and clear protection for environmentally sensitive habitat areas.



Sea Level Rise

Previous and ongoing greenhouse gas emissions have altered the chemical composition of the Earth's atmosphere and caused the phenomenon known as climate change. Many expected impacts are already evident from this change in global processes, with coastal effects becoming ever more visible. There is a strong scientific consensus that climate change will result in more frequent and severe storms, increased sea levels from warming water molecules and melting continental ice sheets, and exacerbated erosion of the shoreline. Coastal states must be proactive in increasing the resiliency of their coastal communities and coastlines. Adequate sea level rise policies include conducting thorough sea level rise vulnerability assessments, directing ample outreach to coastal communities and jurisdictions, and developing comprehensive adaptation plans to prepare for and respond to sea level rise.



WEST COAST

CALIFORNIA

OREGON

WASHINGTON

ALASKA

CALIFORNIA

WEST COAST



There truly is no place like California. Much of California's 1,100 mile coastline has remained remarkable, in part, due to the 1976 California Coastal Act. This landmark law calls for balance between allowed development and the protection of coastal resources. The Coastal Act has also been vital in ensuring that California retains its magnificent natural

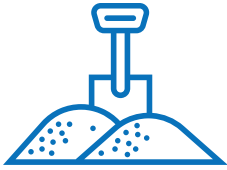
beauty. While the state leads in coastal preservation efforts, there is still much progress to be attained. For example, local communities need to implement detailed plans to increase resilience to coastal hazards and sea level rise, and prohibit the use of harmful emergency seawall permits.



BEACH GRADE

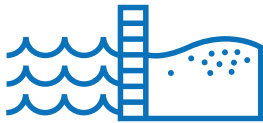
A

Excellent policies
and implementation.



Sediment Management: Good

California has both a Sediment Master Plan and a California Sediment Management Workgroup, which is comprised of local and state agencies, to establish regional plans. In addition, California does a better job than most states with efforts to avoid unnecessary beach fill. Beach fill projects are strictly reviewed under the Coastal Act and stringent permit conditions require extensive environmental analysis and monitoring plans. The state works to consider progressive measures, such as the reuse of dredged sand, and California is currently analyzing the removal of obsolete dams. Multiple agencies also provide extensive resources and studies related to sediment.



Coastal Armoring: OK

The California Coastal Commission (CCC), through its Local Coastal Programs, often puts restrictions on constructing new armoring and the repair of existing seawalls. Unfortunately, the CCC continues to administer emergency permits for shoreline stabilization structures, resulting in seawalls becoming permanent. The CCC continues to back away from permit conditions that require the removal of seawalls and rock revetments. Fortunately, California agencies and local municipalities have increased efforts to fund and implement living shorelines and other natural mechanisms as alternatives to seawalls.



Development: Good

Unlike many other states, California has managed to limit unnecessary development, leaving the coastline less impacted in most locations (with the exception of large metropolitan areas). The Coastal Act has clear requirements about development, redevelopment and 'setting back' structures from the shoreline. The state also does a good job of protecting environmentally sensitive areas and often applies additional protections to prevent degradation.



Sea Level Rise: Good

California has every box checked when it comes to sea level rise planning. In fact, in 2018 alone, the Coastal Commission released its Residential Adaptation Planning document; the Ocean Protection Council adopted a new sea level rise guidance; and the California Resources Agency updated the *Safeguarding California Plan* and released the 4th California Climate Change Assessment, which updated sea level rise projections to reflect new science. In addition, the *California Department of Transportation* published a *Vulnerability Assessment* report. To top off recent progress, the state passed legislation that will help to curb climate change.

Recommendations:

- Prohibit the use of emergency seawalls and hard stabilization devices
- If deemed entirely necessary, only offer emergency permitting with strict time limits for removal and a legal commitment by the property owner to remove the seawall and implement an alternative stabilization method
- Establish firm requirements to use soft stabilization methods, such as living shorelines and managed retreat, before using stabilization devices or sand replenishment
- Increase efforts to restore natural sediment flow to the coastline
- Increase development setback standards relative to current sea level rise predictions
- Offer local municipalities and homeowners more legal advice on managed retreat, protecting public access through rolling easements and rezoning in light of sea level rise
- The California Sediment Management Workgroup must bolster its efforts to establish concrete regional sediment management plans

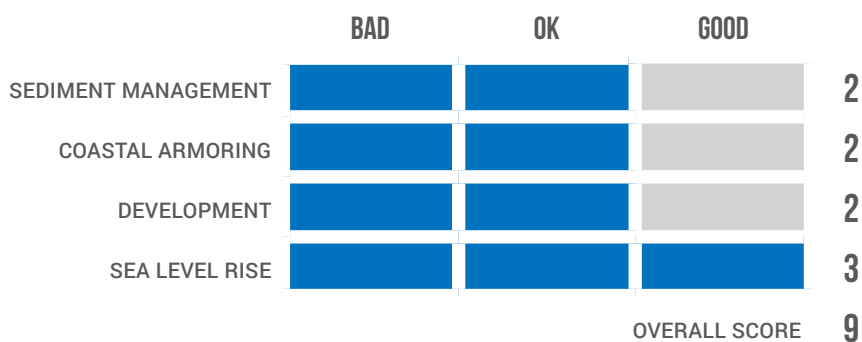
OREGON

WEST COAST



With lush towering trees and massive rock formations, Oregon's iconic coastline attracts a range of visitors hoping to sightsee, swim, surf, explore and fish. While strong Statewide Planning Goals exist for guiding the protection of beaches and dunes in Oregon's land use planning, the system relies on local governments to interpret and

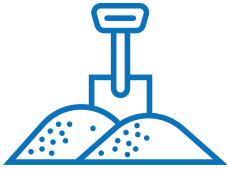
implement the goals through comprehensive plans that are subject to the political pressures of development interests. Oregon's grade increased in 2018 because they curtailed preemptive seawall permits and approved less armoring projects than in previous years.



BEACH GRADE

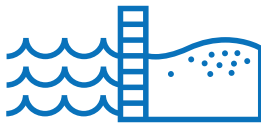
B-

Good, but can be improved.



Sediment Management: OK

While Oregon has a sediment management policy in place, it lacks explicit beach fill policies that protect coastal resources. Oregon has permitting requirements for beach fill projects under the Oregon Parks and Recreation Department but the state is lacking in monitoring plans. Unfortunately, Statewide Planning Goal 18, which is designed to protect beaches and dunes, allows for 'dune grading' for 'view enhancement,' among other sand management activities, which are provided for by local management plans. Fortunately, unlike some East Coast states, Oregon doesn't rely on beach fill for erosion control.



Coastal Armoring: OK

Oregon's permitting process for coastal armoring is well established and, for the most part, is thorough. As a foundational policy tool, Goal 18 limits coastal armoring to areas that were developed prior to 1977 and it has been effective for limiting armoring on the vast majority of Oregon's shoreline. The state also maintains a geospatial inventory of coastal armoring. Over the years, the trend for approving coastal armoring has declined. Similar to California, the state allows for 'emergency' permits and lacks robust conditions for such permits.



Development: OK

Oregon lacks two important coastal development policies, including a standardized setback system for development and restrictions on new development. While the state does provide a model development policy and has established beneficial restrictions on repair and redevelopment, it is up to the local governments to fully establish, implement and enforce local interpretations of Goal 18. Limited sensitive areas, such as wetlands, certain dunes and coastal headlands, are provided protection under Goal 18.



Sea Level Rise: Good

Oregon continues to diligently plan for climate change. The state has completed a vulnerability assessment and an adaptation plan. It also encourages local communities to proactively plan for climate change impacts through its Climate Ready Communities program. Oregon is far ahead of other states in protecting public access in light of future sea level rise, and has even established a rolling easement policy.

Recommendations:

- Set statewide minimum development setback policy and establish repair and rebuilding restrictions for infrastructure that has been damaged by coastal hazards
- If deemed entirely necessary, only offer emergency permitting with strict time limits for removal and a legal commitment by the property owner to remove the seawall and implement an alternative stabilization method
- Develop and require local governments to implement sand management plans that require the analysis of environmental and recreational impacts prior to project approval. In addition, institute a monitoring program that reviews long-term effectiveness of replenishment projects
- Ensure that local agencies and coastal managers communicate with community members about climate change issues and guidance
- Close loopholes for preemptive armoring and adhere consistently to coastal preservation and erosion policies

WASHINGTON

WEST COAST



Washington's diverse shorelines include the rugged coasts along the Pacific Ocean and the rocky and sandy beaches of the Salish Sea, which consists of the Strait of Juan de Fuca, the Puget Sound, and the San Juan Islands. This rich marine environment provides unique and diverse habitat, in addition

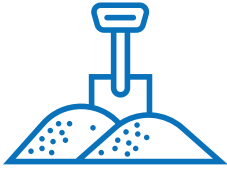
to abundant recreational opportunities. Coastal and marine ecosystems, development pressure and other environmental challenges vary significantly between the Washington coastline and the network of waterways that comprise the Salish Sea.



BEACH GRADE

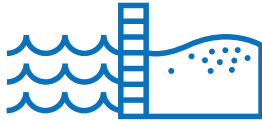
B

Good, but can be improved.



Sediment Management: OK

Washington's statewide sediment management policy is lacking a holistic approach because it narrowly focuses on dredging and does not explicitly provide beach fill regulations. However, the state does not heavily rely on beach fill and has a decent permitting process for replenishment projects.



Coastal Armoring: Good

Similar to California, Washington has established local plans, known as Shoreline Master Programs. The plans clearly provide policies to avoid the installation of new shoreline armoring, unless determined necessary under highly specific conditions. Washington has also made concerted efforts to remove coastal armoring projects in order to help restore ecological functions. In addition, Washington is ahead of other West Coast states in terms of implementing living shorelines and restoration projects.



Development: Good

The Shoreline Management Act, passed in 1971, requires local municipalities to establish robust development standards. These include setback requirements, limitations on new development and redevelopment, and the protection of public access related to development. Washington also does a good job of protecting sensitive habitats, such as wetlands and dunes, from poorly planned development.



Sea Level Rise: OK

Washington has taken proactive measures to address climate change and adaptation plans. The Washington Coastal Resilience Project, which was partially created by state agencies, released the 2018 *Assessment of Projected Sea Level Rise for Washington*. In addition, the state has conducted a vulnerability assessment, developed risk maps and has carved out policies to protect lands from future sea level rise. Local Shoreline Master Programs (SMPs) are increasing resiliency and sea level rise planning work. Unfortunately, while the SMPs guidelines provide recommendations, they do not require counties and municipalities to address sea level rise.

Recommendations:

- Establish explicit regulations for beach replenishment projects to ensure coastal resource protection and avoid expensive projects that can burden taxpayers
- Develop a coastal resiliency plan to comprehensively address the challenges of coastal erosion, sediment management and sea level rise
- Require all municipalities to incorporate sea level rise into regional Shoreline Master Plans
- Explore mechanism for managed retreat and infrastructure relocation

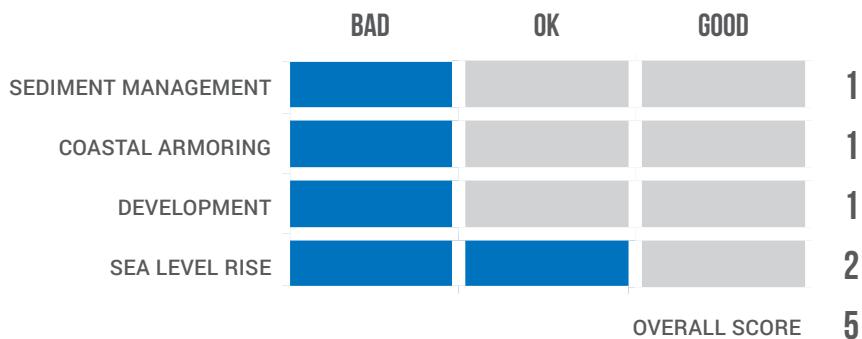
ALASKA

WEST COAST



Alaska has more coastline than the rest of the United States combined (more than 34,000 miles). While much of Alaska's coastline is undeveloped with pristine beaches and coastal areas, the state does have several commercial activities, such as gas extraction, logging and mining, that impact coastal resources. Unfortunately, Alaska withdrew

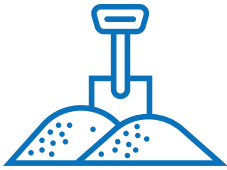
from the Coastal Zone Management Act (CZMA) program in 2011. The CZMA program is a partnership between the federal government and state governments to ensure proper management of shorelines and coastal communities. Alaska's grade improved this year because the state has greatly increased sea level rise planning efforts.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: Bad

Alaska is lacking sand replenishment or regional sediment management plans. Unfortunately, one of the only policies that deal with sediment management is with sediment management is the Sediment Quality Guideline Options policy, which largely prescribes recommendations on how to process contaminated sediment. Large-scale construction projects, such as natural gas pipelines, are required to submit an erosion and sedimentation control plan with their development application.



Coastal Armoring: Bad

While Alaska lacks concrete policies regarding coastal armoring, agencies are encouraged to consider non-structural alternatives prior to constructing hard structures. Unfortunately, there are no restrictions on the use of hard shoreline structures on private property. Instead of the state being the lead on managing erosion, many federal agencies are involved in various aspects of erosion management.



Development: Bad

Development standards are largely created at the municipal level and are relatively lackluster. Alaska also does not have a statewide setback policy and it does not place restrictions on the rebuilding of structures near the coast after they have been damaged by flooding. According to Alaska's Coastal Assessment and Strategy document, only six coastal districts and five communities have approved state comprehensive management plans. However, the state does a good job of protecting sensitive habitat from development.



Sea Level Rise: OK

Within the last year, Alaska has made enormous strides in planning for climate change. In September 2018, at the request of the state governor, members of the Climate Action for Alaska Leadership Team were tasked with creating climate change policy recommendations and a climate action plan for Alaska. The Division of Community and Regional Affairs created the Alaska Climate Change Impact Mitigation Program to provide technical assistance and funding to communities imminently threatened by climate-related natural hazards, such as erosion, flooding, storm surge and thawing permafrost. While many of the recommendations deal with curbing emissions, the intent of the program is to help impacted communities develop a planned approach to shoreline protection, building relocation and/or eventual relocation of the entire community.

Recommendations:

- Develop coastal zone management enhancement plans and rejoin the Coastal Zone Management Program, which works with states to address coastal issues
- Develop adaptation plans for coastal communities
- Establish more thorough policies on relocation and managed retreat of structures prone to erosion and sea level rise
- Develop strategies that limit or prohibit shoreline armoring
- Create regional sediment management and replenishment plans that require the consideration of environmental impacts and extensive monitoring



GREAT LAKES

ILLINOIS

INDIANA

MICHIGAN

MINNESOTA

OHIO

PENNSYLVANIA

WISCONSIN

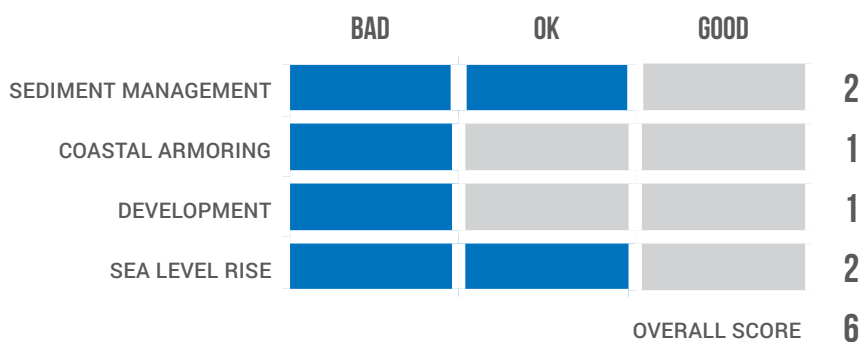
ILLINOIS

GREAT LAKES



Illinois' white sand beaches on the Lake Michigan shoreline are a staple of the city of Chicago. However, as one of the last states to join the Coastal Zone Management Program, Illinois has a lot of catching up to do when it comes to shoreline preservation. Much of the shoreline is hardened or frequently nourished. Without strong policies that encourage

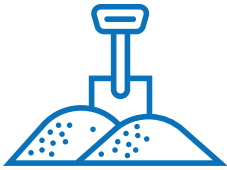
the use of living shorelines or managed retreat, we can likely expect maladaptive shoreline armoring to continue. Fortunately, in October 2017, the state's Department of Transportation made progress in preparing for coastal hazards with the All Hazard Plan, which contains a section that broadly discusses climate change.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: **OK**

The state conducts and encourages beach fill on their lakefronts. Without strong standards for sand quality or requirements to conduct monitoring, the environmental impacts are minimally understood. However, permits for building a beach are required from various coastal management and water quality agencies, and permits for beach fill are streamlined. Although Illinois does not have a regional sediment management plan, they are in the process of developing one by establishing the North Shore Regional Sand Management Working Group.



Coastal Armoring: **Bad**

While Illinois policy implies that projects that are able to disrupt sand transport along beaches and nearshore areas are not approved, much of the coastline is somehow armored. Seawalls, groins and breakwaters are permitted but must include a 28-day public notice and maladaptive emergency permits can be expedited. There is no indication of conditions that set time limits, monitoring, removal of derelict armoring, or required permitting for repairs. Non-structural shoreline stabilization techniques and living shorelines are also not adequately encouraged or used.



Development: **Bad**

Much of the natural Illinois shoreline has been developed. There are no statewide mandated setback requirements or construction restrictions on the shoreline. Though the shoreline is experiencing continued erosion, no coastal hazard areas have been defined. *The Coastal Management Program* indicates a priority to protect the few undeveloped areas, and the state has *The Illinois Natural Areas Preservation Act* to provide authority to local agencies and protect natural areas. However, there are still minimal policies in place to protect shoreline resources.



Sea Level Rise: **OK**

Illinois has been relatively slow in addressing climate change. However, the Department of Transportation made progress in 2017 by releasing the *All Hazards Plan*. While the plan includes a section on climate change, it doesn't provide vulnerability maps or policy recommendations. Local governments are encouraged to conduct mitigation planning and the state has some adaptation and coastal management tools available. In addition, the *Illinois Wildlife Action Plan* encourages better protection of coastal habitat, although it is outlined more as guidance than an official policy.

Recommendations:

- Require that non-structural shoreline stabilization measures, such as living shorelines, dune restoration, and the protection of coastal areas, are considered before sand replenishment projects are approved
- Establish statewide minimum development setback requirements
- Require the monitoring of ecological impacts and efficacy of sand replenishment projects
- Identify and map coastal hazard areas
- Generate construction restrictions in erosion or flood-prone areas, in addition to the completion of a coastal climate change vulnerability assessment and adaptation plan
- Prohibit the use of hard stabilization structures, such as seawalls, groins, and breakwaters; if hard stabilization must occur, require conditions that set time limits, monitoring, removal of derelict armoring and permitting for repairs
- Provide coastal hazard mapping in the *Illinois Geospatial Data Clearinghouse*

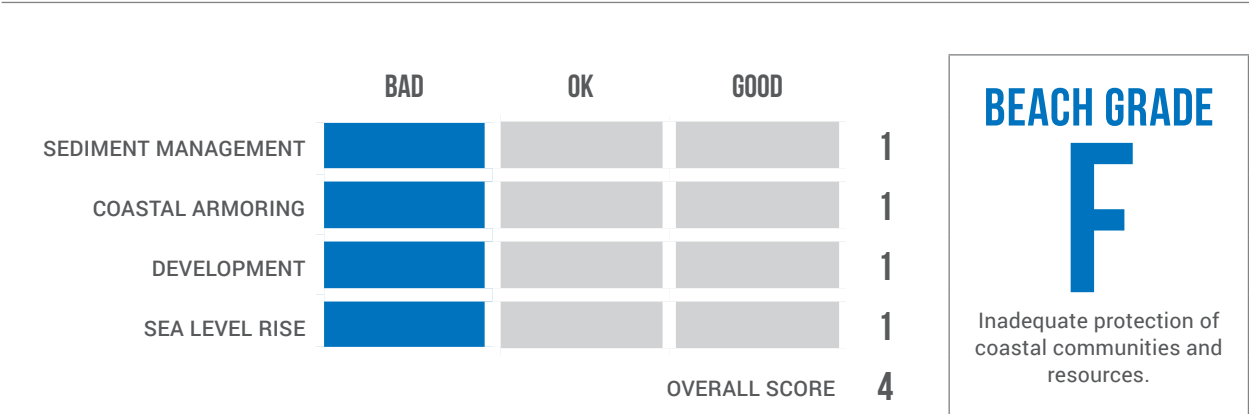
INDIANA

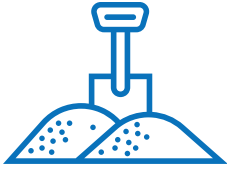
GREAT LAKES



Indiana’s 40-mile shoreline along Lake Michigan contains some of the nation’s most impressive coastal sand dunes, including the 140-foot tall Mount Baldy. Indiana has taken great care to protect these remarkable glacial remnants by establishing the Indiana Dunes National Lakeshore. However, for the rest of the coastline, coastal management does

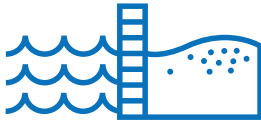
not seem to be a high priority as the state fails to provide foundational coastal preservation policies. Recent efforts to conduct beach nourishment with dredged material from heavily industrialized Lake Michigan is also a step in the wrong direction.





Sediment Management: Bad

Indiana promotes the use of beach fill and encourages beneficial reuse from dredge projects. While policies require that sand is free of contaminants, the test criteria is not standardized, so harmful pollutants that enter Lake Michigan may be getting placed on Indiana's beaches. The oversight of these projects is minimal and applicants are to assume their beach fill project is approved if there is no response from the agency.



Coastal Armoring: Bad

Hard structures used for coastal armoring require a permit from the Indiana Department of Natural Resources. However, they are widely accepted for use across the coastline, even in wetlands. Standards for the design, components and the placement of new or repaired hard structures are dictated by the type of lakefront 'category,' (e.g., developed area, significant wetland, etc.). They also often require some element of 'bioengineered materials,' but in general, repairs are not restricted. Non-structural shoreline stabilization alternatives are not encouraged.



Development: Bad

Almost half of the Indiana lakeshore is protected by the Indiana Dunes National Lakeshore. While this ensures the ability of dunes to provide natural coastal hazard mitigation benefits, the development policies outside of this protected area are lacking. There are no statewide minimum development setback requirements, even in hazardous areas. There is a geodatabase of the Lake Michigan Shoreline, which is intended to identify and encourage future development away from hazardous areas, but it doesn't require developments to avoid those areas.



Sea Level Rise: Bad

Indiana lacks policies that address climate change, with no climate change adaptation plan or state website dedicated to the topic. The state encourages local planning efforts and provides resources for flooding and coastal hazard planning, but efforts to address coastal issues tend to be short-term and reactionary rather than planned and long-term. The state should consider climate change vulnerabilities in coastal management efforts and establish clear climate change adaptation plans.

Recommendations:

- Strengthen permitting and authorization requirements for sand replenishment projects, including the review and written notification of approval or disapproval by state agencies
- Develop sediment management plans and sediment monitoring protocols
- Prohibit armoring in sensitive habitat areas, and implement time restrictions and removal requirements on approved stabilization structures
- Require that living shorelines and soft stabilization methods are considered prior to coastal armoring
- Establish statewide mandated development setback requirements and managed retreat regulations
- Prohibit new construction and repairs in identified hazard areas
- Develop a website to provide information on climate change and potential impacts to coastal areas of the state
- Conduct a climate change vulnerability assessment and develop a coastal adaptation plan

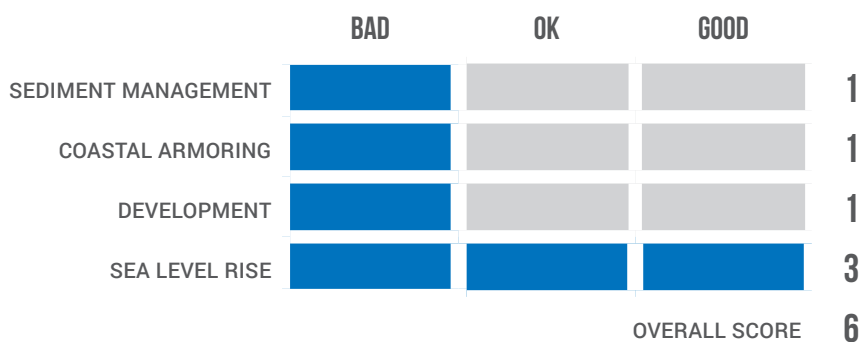
MICHIGAN

GREAT LAKES



At over 3,000 miles, Michigan's shoreline is the longest in the continental U.S., exceeding the lengths of both Florida and California. While Michigan has been proactive when it comes to climate change, the state falls short in most other categories. The Michigan Climate Action Network has at least eleven cities that have adopted climate action plans to

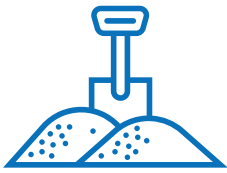
establish strong climate targets so far, in addition to great resources to engage the community. The issue with Michigan lies in current practices, including the lack of policies for careful sediment management, overuse of coastal armoring and approval of developments in 'protected dune areas.'



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: Bad

There are no regional sediment plans or policies regulating private sand replenishment landside of the water line. In addition, there is essentially no beach fill policy. Testing of sediment is only required if collected from areas known or suspected to be contaminated. Even though Michigan provides strong protection of sand dunes with the 'Sand Dunes Protection and Management Program,' the state should establish a sand replenishment policy that requires thorough analysis of impacts and encourages coastal regions to develop regional sediment management plans.



Coastal Armoring: Bad

The Michigan Department of Environmental Quality (DEQ) accurately recognizes that hard shoreline structures exacerbate erosion and reduce water quality. However, seawalls can still be allowed with a general permit. Without clear requirements for monitoring or removal, the policies can enable seawalls to be routinely reinforced. Fortunately, the state encourages the use of natural stabilization treatments, although consideration of alternatives is not mandated. For those interested, there is a clear and easy to read [natural shorelines guide](#) that shares information to lakefront property owners.



Development: Bad

Michigan has robust setback regulations based on the rate of erosion, plus an additional 15 foot buffer. Most areas have updated their erosion rates, although some are still using rates calculated 20 years ago. High Risk Erosion Areas are well defined and while additional permits are required, new developments can still be approved. The lack of clear regulations on the repair of developments may also lead to unnecessary damage or loss of properties. Unfortunately, new developments in 'protected' dunes and wetlands have also recently been permitted.



Sea Level Rise: Good

Michigan has been proactive in creating a Climate Action Plan and encouraging local jurisdictions to follow through on establishing climate goals and commitments. Michigan has also created a thorough Community Resilience handbook, which touches on coastal hazards and lake level change. Broad adaptation methods are discussed but the state still has not developed an approved coastal adaptation plan. While the state does a nice job of assessing future risks and developing adaptation plans for ensuring habitat connectivity and protection of natural environments, it needs to stop current development risks.

Recommendations:

- Prohibit construction on protected dune area and in wetlands
- Establish a sand replenishment policy that requires thorough analysis of potential impacts
- Encourage coastal regions to develop regional sediment management plans
- Prohibit the use of seawalls, or if necessary, require clear conditions of monitoring and removal
- Prohibit construction in coastal dunes and wetlands
- Limit construction, repair and/or reconstruction of existing coastal development in hazard areas
- Conduct a statewide climate change vulnerability assessment
- Implement recommended actions and suggestions described in the 2012 Adaptation Plan

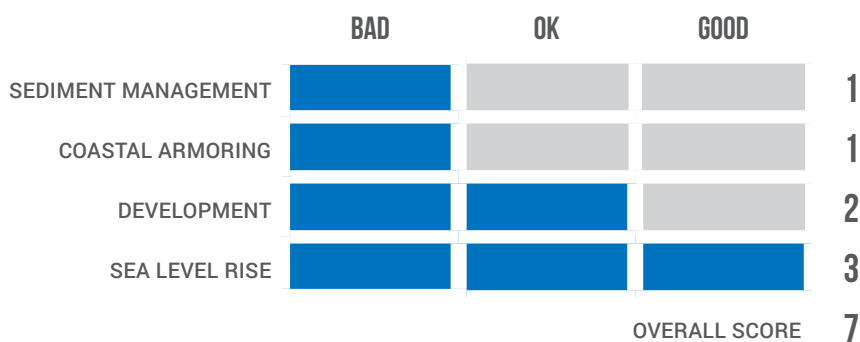
MINNESOTA

GREAT LAKES



Minnesota's significant coastline along Lake Superior, dubbed the 'North Shore,' is beloved by locals and tourists for its beautiful lakefront scenery and outdoor recreation. Minnesota stands out from most of the other Great Lakes states by identifying climate change as a major issue and being proactive to address it. However, the state has yet

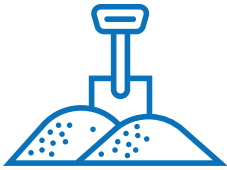
to complete an updated Coastal Management Program for 2016-2020. Minnesota also fails to regulate shoreline structures and sediment management well, perhaps due to the fact that coastal erosion is just recently becoming a major issue for the state.



BEACH GRADE

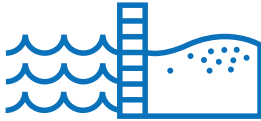
C

Mediocre.



Sediment Management: **Bad**

There are no regional sediment management plans. Small-scale fill projects ('sand blankets') do not need a permit if they meet a fairly short list of conditions, including the use of 'clean, inorganic sand or gravel, free of pollutants.' Unfortunately, there are no explicit testing, monitoring or reporting requirements so there is no assurance that conditions have actually been met. Fortunately, larger beach fill projects require permits and an erosion and sediment plan under the Protected Waters Permit Program.



Coastal Armoring: **Bad**

Minnesota has been lenient with hard shoreline stabilization structures, allowing armoring, such as riprap, to be used without a permit as long as the project meets a list of conditions. There is little to no assessment of the ability to meet conditions and consultation with a hydrologist is the only recommendation. Policies claim that larger shoreline stabilization structures require permits but the exact structures are unclear. No policies were found for restoration, repair or the removal of armoring.



Development: **OK**

There are substantial statewide setback standards for coastal developments, with minimum setbacks ranging from 50 to 200 feet from the shoreline and more stringent standards in erosion hazard areas. Repairs and rebuilding after storm damage in coastal hazard areas may also be permitted but it depends on the local authority. While Minnesota has a proactive mitigation plan for preventing landslides through bluff protection, mapping and native vegetation, there is minimal protection of important coastal habitats, such as wetlands and dunes.



Sea Level Rise: **Good**

Minnesota is one of the few states to complete a comprehensive *Climate Change Vulnerability Assessment* and there is an abundance of resources and information available on the Climate Change Web Portal. The Interagency Climate Adaptation Team regularly updates a state adaptation report. However, the North Shore Climate Group found that local adaptation and hazard mitigation plans lack congruence and effectiveness. Regarding habitat protection, Minnesota has a proactive riparian connectivity program, which could be vital to local wildlife in a changing climate.

Recommendations:

- Develop concrete sand replenishment policies that look at the long-term effectiveness and impacts of beach replenishment projects
- Require permitting to ensure that even small replenishment projects are needed and mitigate negative impacts to sensitive habitats
- Establish restrictions on the construction and repair of hard shoreline protection structures
- Encourage the use of non-structural alternatives, such as living shorelines and restoration
- Clarify guidelines for local adaptation plans to ensure better congruence and effectiveness

OHIO

GREAT LAKES



Ohio's Lake Erie shoreline contains a diverse set of developments, including popular tourist beaches, amusement parks and historic lighthouses. In addition, there are areas of extensive industrial development, severe pollution and frequent harmful algal blooms. These significant coastal issues demonstrate the need for better policies to manage

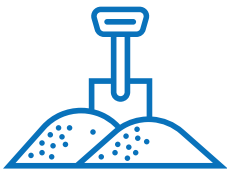
and protect Ohio's 300+ mile stretch of shoreline. Instead of strengthening policies to increase coastal resilience and coastal preservation, Ohio has actually moved in the other direction by implementing a maladaptive Temporary Shore Structure Permit policy.



BEACH GRADE

F

Inadequate protection of coastal communities and resources.



Sediment Management: Bad

Beach nourishment is strongly encouraged without apparent regard for sand source, environmental impacts or disruption of sediment flow. With the 2016 passing of Senate Bill 1, Ohio must find another use for its estimated 1.5 million tons of dredged material annually by 2020, which is likely destined for Ohio's beaches. Unfortunately, replenishment projects only require permitting if placed lakeside of the shoreline and there is no indication of monitoring requirements.



Coastal Armoring: Bad

A large majority of Ohio's coastline is already hardened and armoring is still used as the first line of defense. New shoreline structures require permits from multiple agencies and must be prepared by an engineer. However, in 2018, Ohio started offering a 'free expedited permit' for temporary (less than two years) armoring, which can be used for new structures or to repair existing unpermitted structures. Without an explicit requirement to remove these structures, this policy could have severe impacts on the marine environment and the future of a natural coastline.



Development: Bad

Although permits are required to build and redevelop permanent structures in identified coastal erosion areas, the state does not have a standard minimum shoreline setback policy. There are also no clear restrictions on the repair of developments in coastal erosion areas. There are some efforts to protect coastal ecosystems, including a National Estuarine Research Reserve and designations of wild, scenic and recreational river areas. Unfortunately, these protections are relatively weak as private developments are not restricted, even in designated natural areas.



Sea Level Rise: Bad

Ohio has no statewide policies for addressing climate change and there's not even a website with information on threats from climate change. There is a broad vulnerability assessment regarding coastal erosion in the 2011 Hazard Mitigation Planning Program, but with minimal outlook at future vulnerabilities. All in all, Ohio is significantly lacking in terms of coastal climate change planning and this failure to proactively prepare for lake level changes is resulting in destructive, short-sighted policies, such as the recently implemented temporary armoring policy.

Recommendations:

- Establish minimum setback requirements on coastal developments
- Prohibit new developments from installing hard structural erosion control measures
- Revoke the Temporary Shore Structure Permit program; require all participating to remove the structure after two years and restore to a natural shoreline
- Conduct a statewide coastal climate change vulnerability assessment
- Develop a coastal climate change adaptation plan
- Ensure the sand management plan includes policies on beach replenishment projects, including the consideration of other soft structures first, monitoring requirements and permits for waterside and landside sand placement

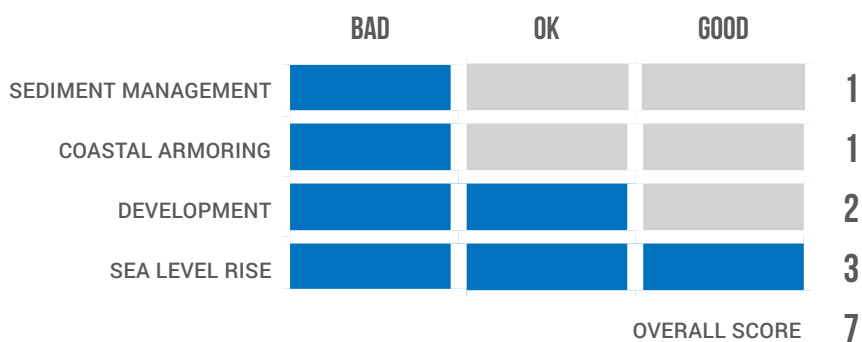
PENNSYLVANIA

GREAT LAKES



With the peaceful Delaware Estuary to the East, and the busy industrial coastline of Lake Erie to the West, Pennsylvania has a couple of robust regulations on coastal development. The state has made significant efforts to understand climate change impacts and released the latest *Climate Change*

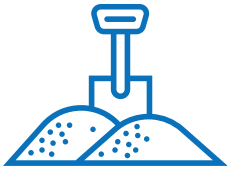
Adaptation and Mitigation Plan in June, 2018. Unfortunately, the plan fails to address coastal erosion and, paired with the current reliance on beach fill and lack of restrictions on armoring, Pennsylvania needs to act now to protect the future of its natural coastlines.



BEACH GRADE

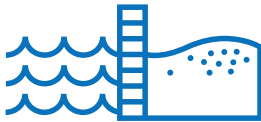
C

Mostly poor, lacking.



Sediment Management: **Bad**

The state relies heavily on beach fill and in June, 2018, secured \$1.5 million in federal funds to conduct a fill on Pesque Island. The state already spends an estimated \$3 million annually for beach fill. It is unclear if permits or monitoring protocols are required for small fill projects. There is a comprehensive regional sediment plan for the Delaware Estuary but nothing for the Lake Erie shoreline. The state would benefit from more comprehensive, proactive sediment plans that focus on restoring natural sediment movement and protecting beach ecology.



Coastal Armoring: **Bad**

Pennsylvania does not have restrictions on the construction, repair, or replacement of hard shoreline devices. There is no indication that seawalls and other hard structures require monitoring or removal after they are no longer useful. There need to be more informational resources on living shorelines, in addition to codified requirements to use living shorelines as the first line of defense, such as creating and protecting riparian buffers, before reverting to armoring.



Development: **OK**

Pennsylvania has a minimum development setback rate in established *Coastal Hazard Erosion Areas*, based on the average rate of bluff recession and type of structure, with a minimum of 25 feet. Unfortunately, municipalities can modify setback requirements if they are able to prove low erosion risk. Repairs resulting in a substantial improvement to structures beyond the setback is prohibited. For the waterfront, new developments can occur close to the water's edge, between the Ordinary High and Low Water mark, and just require federal and state permits.



Sea Level Rise: **Good**

Pennsylvania has taken proactive efforts to address climate change impacts, with climate change research and planning required by state law. The Department of Conservation and Natural Resources recently finalized the 2018 *Climate Change Adaptation and Mitigation Plan*, which encourages adaptation methods that protect natural areas, including the protection and restoration of floodplains and riparian areas, the removal of old dams, and the avoidance of constructing and rebuilding in hazard areas. Unfortunately, like other Pennsylvania climate reports, this plan lacks information about the state's vulnerability and adaptation options for coastal erosion.

Recommendations:

- Develop more explicit policies to protect coastal and environmentally sensitive habitat areas
- Improve sand replenishment management through thorough analysis of environmental impacts and effectiveness, and develop regional sediment and inlet management plans
- Require consideration of alternative stabilization, such as the restoration and protection of dunes and coastal vegetation, in addition to restoring natural sediment flow, before permitting beach fill
- Develop policies and regulations on hard shoreline protection structures and their repair and replacement
- Codify requirements to consider non-structural methods before armoring is allowed
- Remove the policy that allows municipalities to reduce minimum development setback standards
- Conduct vulnerability assessment and develop adaptation plans for sea level rise and lake level change

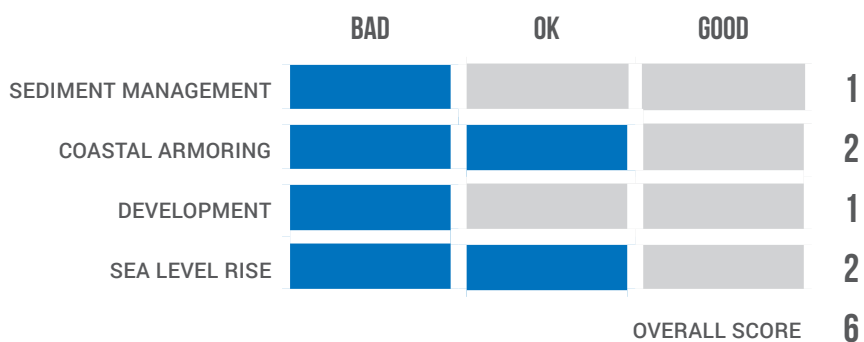
WISCONSIN

GREAT LAKES



Wisconsin is bordered by both Lake Michigan and Lake Superior, resulting in an extensive freshwater coastline over 800 miles long, with several important wetland ecosystems. Although the state has policies on coastal development, shoreline construction and natural resource

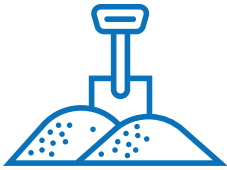
conservation, many of the regulations are not stringent. While the fundamental vision for coastal management is there, regulations need to be strengthened for management strategies to be effective.



BEACH GRADE

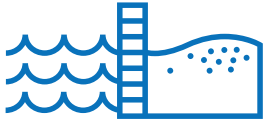
D

Mostly poor, lacking.



Sediment Management: **Bad**

There are no regional sediment management plans and the state encourages beach fill as a method to prevent erosion. Property owners are required to get a permit if a fill project is below the Ordinary High Water Mark. They may also need a permit for dry sand but it depends on the local city. While there are some loose policies to avoid environment impacts and good recommendations on best practices, these aren't mandatory and there are no monitoring requirements.



Coastal Armoring: **OK**

The use of armoring and seawalls require a coastal permit and are generally only granted in 'high energy sites.' Unfortunately, small rip rap projects are exempt. Some river basins are not required to meet permit requirements, while natural areas, like the Lower St. Croix National Scenic Riverway, are more strict and require an erosion control plan and vegetation management plan. The state provides guidance for soft structures, such as brush layering and biodegradable breakwaters, but doesn't require consideration of these methods first.



Development: **Bad**

The state has a minimum setback requirement of 75 feet but there are many loopholes. After a storm, homes and structures can be rebuilt to the same size and wet boathouses are able to be repaired in a way that extends lifespan and increases value. Recent provisions weaken the protection of the coastline, including regulations that prevent counties from having more robust setbacks, allow unlimited maintenance and repair of coastal developments and reduce protections for man-made wetlands.



Sea Level Rise: **OK**

Wisconsin has an extensive amount of resources on climate change, likely due to the *Wisconsin Initiative on Climate Change Impacts* (WICCI). WICCI aims to clarify climate change impacts and identify vulnerabilities. Reports include important state resources, climate change vulnerability assessments of shorelines and wetlands and recommended adaptation measures. Unfortunately, there is minimal focus on the protection of riparian areas for coastal adaptation. In addition, the state reduced protections for artificial wetlands in 2017.

Recommendations:

- Create an inventory of nourishment projects and develop regional sediment management plans
- Require replenishment projects above the high water mark to prove necessity
- Require permitting and monitoring for beach nourishment projects
- Develop and implement climate change adaptation plans
- Prohibit maintenance and repair of developments that do not conform to current development standards
- Allow municipalities to establish policies that are more stringent than statewide minimums
- Strengthen the state's policy on repairing and rebuilding houses and other buildings destroyed or damaged in natural disasters; and make more restrictive to prevent the same type of damage from occurring again
- Add more specific language to coastal policies for conserving natural land and water resources to give protection to natural resources and provide coastal hazard mitigation benefits



GULF STATES

ALABAMA

LOUISIANA

MISSISSIPPI

TEXAS

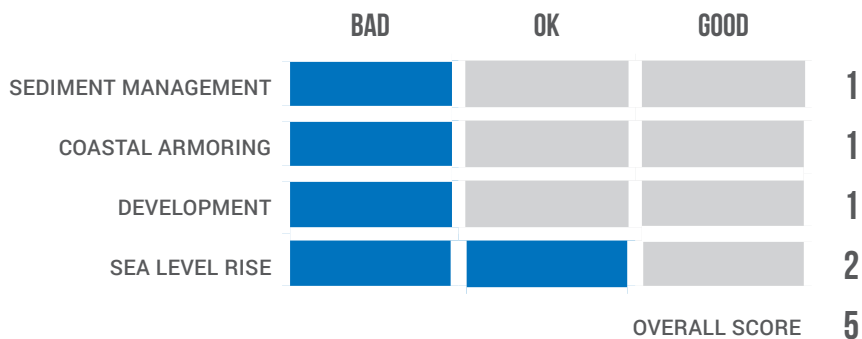
ALABAMA

GULF STATES



Alabama's white sand beaches along the Gulf of Mexico, in addition to 600 miles of lush bayou and river shorelines, attract thousands of visitors annually. Unfortunately, the state does not have thorough policies in place to protect these vital economic resources. Although there is much

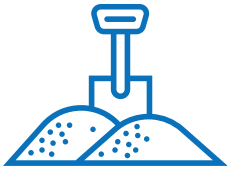
more to be done, Alabama made improvements in 2018 with the release of the *Draft Hazard Mitigation Plan*, which is the first time the state has identified coastal vulnerabilities to climate change.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: Bad

With rapid erosion and wetland loss, exacerbated by years of excessive dredging, the state encourages the use of beach fill to combat land loss. While regional sediment management plans are encouraged by the state, only Mobile Bay has produced one. A permit is required for sand replenishment projects and must be consistent with the *Alabama Coastal Area Management Plan*. However, the Coastal Area Management Plan does not provide clear guidelines on replenishment practices or ecological monitoring and review.



Coastal Armoring: Bad

Property owners must first consider managed retreat and other soft stabilization methods to protect properties on Gulf beaches and primary dunes but if deemed 'infeasible,' they can refer to armoring. Alabama has been doing a lot of work on living shorelines, especially as a remediation tactic after the 2010 Deepwater Horizon oil spill. Although shoreline stabilization policies promote the use of soft and living structures, hard stabilization techniques are still the most prevalent mechanisms. Therefore, it's likely that the state is using a fairly lenient definition of 'infeasible.'



Development: Bad

The state has setback policies and uses the Coastal Construction Line to give the coastal state agency jurisdiction over controlling seaward structures. Unfortunately, the line hasn't been updated since 1979. A hard line on a dynamic shoreline has resulted in areas where the line is actually underwater, causing the state agency to lose jurisdiction over controlling, preventing or permitting coastal structures and repairs. Alabama has also identified a goal to eliminate development in high hazard areas, yet progress or implementation of this goal is not evident.



Sea Level Rise: OK

As of June 2018, the state has made progress in preparing for climate change by developing a Draft Hazard Mitigation Plan. The plan includes an extensive section on sea level rise and coastal land change. It also takes into account different rise rates, land change and king tides. The action strategies and timeline should feature more sea level rise preparations, especially regarding hard structure repair, and a need to increase the Coastal Construction Line. Regardless, this is a step in the right direction for Alabama.

Recommendations:

- Provide clear policies on replenishment practices, in addition to ecological monitoring and review in the Coastal Area Management Plan
- Revive the natural flow of sediment sources where possible
- Amend the location of the Coastal Construction Line and potentially make the line relative to the sea level, allowing it to move with the dynamic coastline
- Put pressure on the Alabama state government to track and ensure the goal to eliminate development in progress in high hazard areas
- Address sea level rise and climate change in coastal policies and hazard mitigation plans
- Conduct thorough sea level rise vulnerability assessments and adaptation plans that promote the use of living shorelines and natural sediment flow

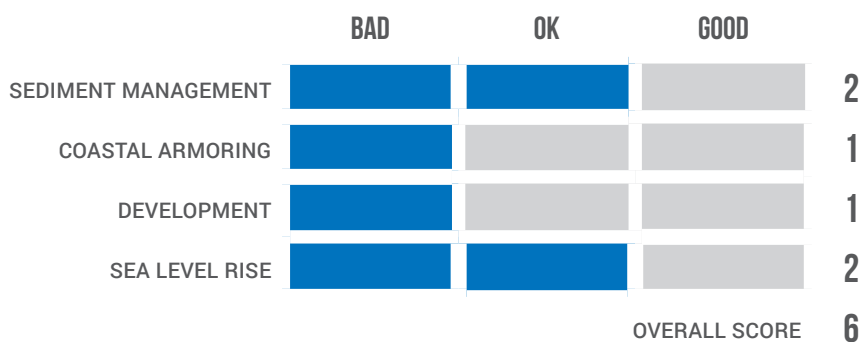
LOUISIANA

GULF STATES



Louisiana has a rich culture deeply rooted in the Gulf and coastal bayous. However, the state's coastlines are severely threatened by flooding, aging infrastructure, wetland loss and exposure to tropical storms and hurricanes. Louisiana has made an impressive effort to develop hazard mitigation plans, strengthen construction codes, increase coastal

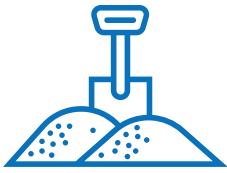
resiliency and strengthen natural buffers. While recent efforts to increase enrollment in the Community Rating System and build to a higher standard are evident, the state needs to adopt better armoring and development management policies.



BEACH GRADE

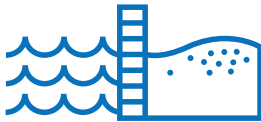
D

Mostly poor, lacking.



Sediment Management: **OK**

There are no regional sediment management plans for Louisiana, even though beach fill is encouraged. Regulations on replenishment projects are also relaxed. While permits are required, there is minimal review of ecological impacts or long-term monitoring. Overall, Louisiana must restore natural sediment flow to alleviate the state's severe erosion and land subsidence. Fortunately, the state is in the process of developing several sediment diversion projects, which is positive as long as they are carefully designed.



Coastal Armoring: **Bad**

There are no statewide policies on stabilization structures, their repair, replacement or removal. This is likely because the river shoreline has been fortified by levees since the 1930s. There are no enforceable policies that promote non-structural stabilization alternatives over armoring. State agencies only mention that non-structural shoreline stabilization methods should be used 'whenever possible.' Some parishes, such as Isle de Jean Charles, offer managed retreat.



Development: **Bad**

There are no statewide minimum setback standards for coastal development and permits are not required to repair or maintain existing structures in hazard areas. A DNR mapping tool is used to determine the need for a Coastal Use Permit, which is generally required for residential and commercial construction in the coastal zone. While the *Louisiana Protection and Restoration Final Technical Report Hazard Mitigation Planning Appendix* has great recommendations to increase the resiliency of the coastline, many of the recommendations are not yet implemented.



Sea Level Rise: **OK**

While there are no statewide requirements to account for sea level rise in local Hazard Mitigation Plans, some communities, such as St. Tammany Parish, have voluntarily done so. Fortunately, the *Comprehensive Master Plan for a Sustainable Coast* allocates billions of dollars to increase the state's coastal resilience and provides a thorough blueprint for coastal flood risk reduction. The state is also making substantial efforts to encourage local jurisdictions to build beyond NFIP Requirements with the recently released *Community Rating System*.

Recommendations:

- Develop regional sediment management plans to help restore natural sediment flows
- Conduct monitoring to track any long-term impacts to coastal ecology for sand replenishment
- Prohibit shoreline armoring, or strictly require that non-structural stabilization methods, such as living shorelines, are used first
- Ensure development standards in hazard areas are enforced
- Limit repair and replacement of damaged developments in high hazard areas, or require them to be rebuilt to higher resilience standards
- Prioritize retrofitting and protecting critical city infrastructure
- Conduct a thorough sea level rise vulnerability assessment and develop an adaptation plan
- Promote projects that restore natural sediment flow to the coast

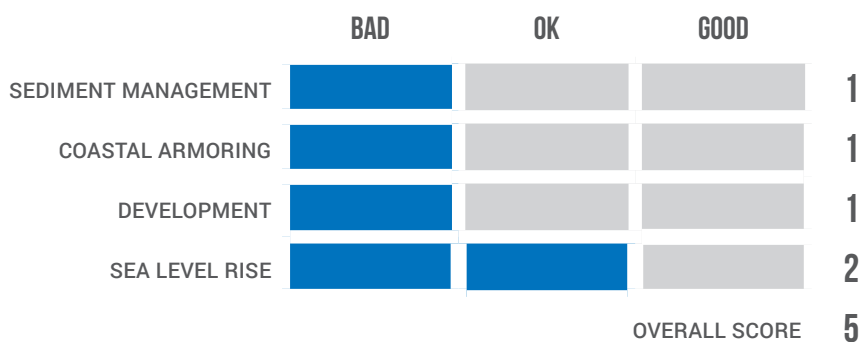
MISSISSIPPI

GULF STATES



The low-lying Mississippi coastline is a mecca for Southern coastal tourism, including recreational fishing, golfing or just lounging on the beach. Unfortunately, the state needs much stronger coastal management policies, from sediment management to coastal development, in order to

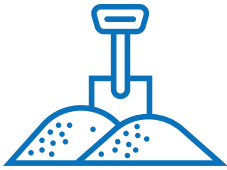
protect its diminishing beaches and wetlands. While there have been some efforts in terms of preparation for climate change with initial discussions of managed retreat and coastal vulnerability assessments, a thorough vulnerability assessment and adaptation plan has yet to be completed.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: Bad

Mississippi is part of the Gulf of Mexico's *Regional Sediment Master Plan* and *Gulf Coast Ecosystem Restoration Task Force*. This group has outlined excellent recommended actions to protect coastal resources. However, Mississippi agencies heavily promote beach fill, encouraging the reuse of all 'suitable' dredged sand. Without clear requirements for testing sand quality, assessing ecological impacts, conducting post-project monitoring, or even obtaining a permit if filling outside of a wetland, Mississippi's sediment management is lacking.



Coastal Armoring: Bad

Mississippi seems to promote all erosion stabilization methods, both soft and hard. The state requires a general permit for hard structures and at times may require neighbor approval. However, the limitations are weak overall and likely to result in permanent structures as continual repair and replacement are automatically permitted. As remediation for the 2010 oil spill, the Deepwater Horizon Restoration Project is helping to repair damaged shorelines. It is also funding large-scale wetland and reef restorations, which should help alleviate the need for future armoring.



Development: Bad

Coastal development policies are extremely relaxed in Mississippi. There are no statewide minimum development setback requirements or limitations on repairing developments in coastal hazard areas. In addition, the construction of a building, fishing camp, or 'similar structure' is allowed in coastal wetlands on private property, even without a permit. However, there has been increased effort to protect natural resources that provide hazard mitigation benefits, including the *Coastal Stream and Habitat Initiative* and *DMR Artificial Reef Program*.



Sea Level Rise: OK

Mississippi completed a sea level rise vulnerability assessment by piecing together 11 different reports and research papers on sea level rise projections for the area. Although it is not a fully comprehensive assessment, it adequately considers negative impacts of various hard structures and identifies adaptation and retreat options. The state would benefit from a comprehensive vulnerability assessment and adaptation plan, in addition to requirements to consider sea level rise and climate change in local hazard mitigation plans, and stronger attempts to disseminate information to local communities and jurisdictions.

Recommendations:

- Establish a statewide development setback minimum
- Prohibit development in wetlands or require that developments are designed to prevent ecological impacts
- Implement a strategy of managed retreat for state-owned infrastructure, such as highways, and repurpose the gas tax to help in this endeavor
- Establish robust armoring policies
- Require that sediment replenishment projects prove a need and consider or monitor ecological impacts
- Consider other methods to preserve coastal beaches instead of just replenishment
- Conduct a thorough sea level rise vulnerability assessment and develop an adaptation plan

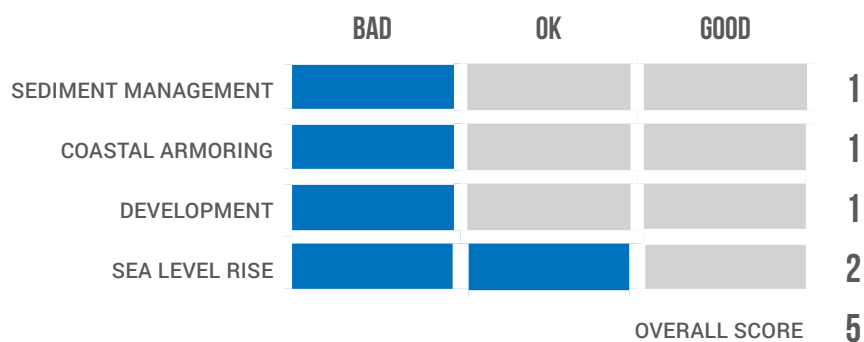
TEXAS

GULF STATES



The severe flood damages caused by Hurricane Harvey in 2017 highlighted major issues with Texas' relaxed development policies and inability to handle coastal hazards. After the storm, Texas received \$5 billion in federal disaster relief funds to develop the *2018 State Action Plan*. Fortunately, the plan provides funding for buyout programs, infrastructure enhancements and local planning.

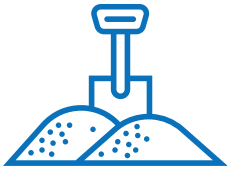
However, these enhancements need to be accompanied by stronger coastal zoning and management policies across the board. This is certainly the case regarding coastal armoring, where Texas has regressed by allowing emergency permits and attempting to permit a massive, maladaptive seawall outside of Houston.



BEACH GRADE

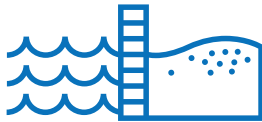
D

Mostly poor, lacking.



Sediment Management: Bad

Texas heavily relies on beach replenishment and conducts frequent, large-scale fill projects. These projects cost over half of the \$22.5 million of state and federal funds allocated every two years to combat coastal erosion in Texas. The state has a sediment management plan and does a thorough job of collecting beach erosion and sediment source data to help inform beach replenishment programs. Unfortunately, there are no identified policies about beach nourishment standards, permit requirements or environmental monitoring.



Coastal Armoring: Bad

The state prioritizes soft stabilization methods like dune and wetland restoration. However, when the threat of exacerbated erosion gets severe, Texas quickly reverts back to seawalls and breakwaters. For example, larger scale coastal armoring projects, including a 17-foot tall, 60-mile long seawall outside of Houston and Galveston, are being proposed. After Hurricane Harvey, the state started to allow emergency permitting for the immediate construction of coastal armoring.



Development: Bad

Texas delegates development and erosion responsibilities to local municipalities. While there is a suggested minimum development setback of 1,000 feet, it is optional and many localities choose to use different standards. Fortunately, dunes are protected by state law and beachfront construction requires the completion of a beach construction certificate and dune protection permit. The state's major issue seems to be the lack of zoning restrictions as Texas allows developments in flood-prone areas, such as filled wetlands and floodplains.



Sea Level Rise: OK

Texas does not have a statewide sea level rise policy. However, state agencies have done some sea level rise mapping. The *Community Health and Management Resource Mapping* application also provides a great method to engage and educate local communities. The *Texas Coastal Resiliency Plan*, which contains climate change adaptation measures, was released in March 2017. Unfortunately, the plan uses conservative sea level rise projections, encourages the use of hard structures, such as breakwaters and seawalls, and fails to put responsibility on human activity.

Recommendations:

- Conduct a thorough sea level rise vulnerability assessment using stronger sea level rise projections during modeling
- Require that abandoned homes on the coastline must be removed
- Establish more consistent implementation of minimum development setback policies
- Continue to support and invest in living shorelines and other soft structures over expensive and short-term sand replenishment
- Require zoning that prohibits new development in high hazard areas and limits repair and maintenance of existing infrastructure in those areas
- Clearly delineate high risk areas (for both flooding and erosion) for use during buyout programs
- Require that homeowner assistance and reimbursement funds are only used for building homes outside of high risk areas, or for rebuilding homes to a higher level of code



NORTHEAST

CONNECTICUT

MAINE

MASSACHUSETTS

NEW HAMPSHIRE

RHODE ISLAND

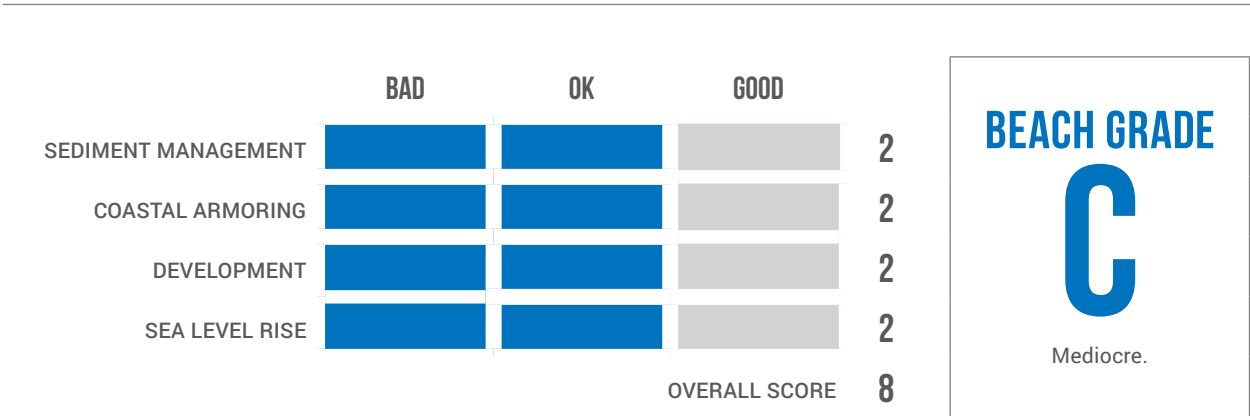
CONNECTICUT

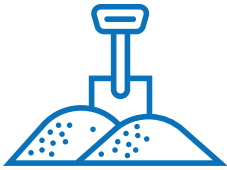
NORTHEAST



Connecticut is lined with stunningly beautiful, historical coastal villages and fishing ports. However, over 70% of this peaceful and serene shoreline is privately owned. State policies are fairly relaxed, especially regarding sediment management. Most coastal policies are left up to local

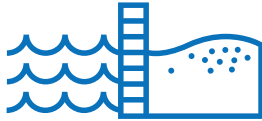
jurisdictions to develop, with minimal state guidance. Connecticut has made progress in 2018 by passing Climate Change Resiliency and Renewable Energy Bills, which create the case for the support of stronger sea level rise planning and greenhouse gas emissions reduction.





Sediment Management: OK

Connecticut has almost no codified regulations to analyze impacts to coastal resources during replenishment projects. Fortunately, as replenishment projects do not fall under a general permit, detailed permit reviews are required. Connecticut has also released a 2018 inventory of natural resources, including sediment, as part of the *Blue Plan* development process. The *Blue Plan* is an ocean management plan in development and slated for inclusion are best practices for sediment management relating to dredging and dredged material disposal.



Coastal Armoring: OK

There are strong policies preventing hard stabilization methods. Armoring is only permitted if there are no possible alternatives with less harmful impacts. There is clear language that homeowners are not entitled to build structures to expand or preserve property boundaries. Managed retreat, infrastructure upgrades and living shorelines are strongly encouraged. The state allows emergency permits for armoring, but only temporarily (30 days or less), which helps to prevent misuse and maladaptation.



Development: OK

Although statewide setback minimums are not established, local jurisdictions can set their own setbacks and restrictions on repair and rebuilding in hazard areas. New developments in coastal hazard areas are not explicitly restricted, but properties proposed in the clearly delineated 'coastal zone' require additional permitting and review. Fortunately, the state has strong protections for coastal dunes, wetlands and intertidal areas, which ultimately provide coastal hazard mitigation benefits.



Sea Level Rise: OK

There has been significant progress at the state level regarding climate change preparedness with the June 2018 adoption of bills on Climate Change Resiliency and Renewable Energy. These bills set greenhouse gas emission targets, require state-funded coastal projects to factor in sea level rise and include climate change adaptation in local planning. While this is a positive step in the right direction, current resources are only informational, the website is fairly out of date, and there is still not a thorough sea level rise vulnerability assessment for the state.

Recommendations:

- Require removal of stabilization structures if damaged or no longer effective
- Only offer emergency permitting if the property owner implements an alternative stabilization method after the 30 days are complete
- Develop stronger policies to ensure habitat connectivity protection throughout the state
- Update climate change resources online and fix broken links
- Update the *Climate Preparedness Plan* to account for coastal hazards
- Conduct a thorough statewide sea level rise vulnerability assessment and set a timeline for the requirements of local jurisdictions to develop adaptation plans
- Strengthen the *Coastal Structures Act* to increase restrictions on structural modifications
- Encourage regional sediment management plans for beaches and associated inlets
- Require extensive monitoring of ecological impacts from replenishment projects
- Provide more consistent minimum protections of coastal resources from development, including setbacks

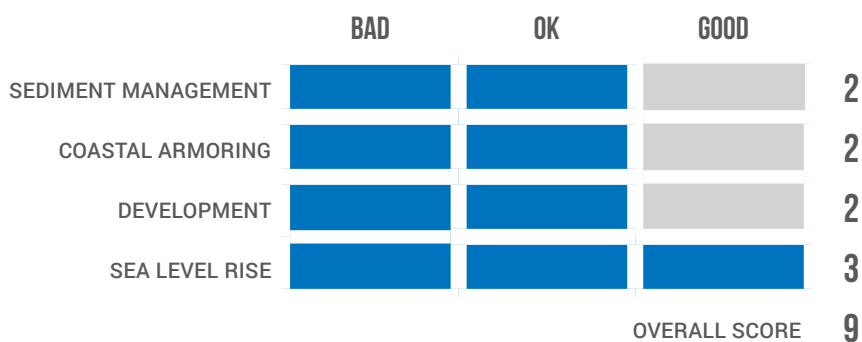
MAINE

NORTHEAST



Maine has fairly strong coastal management practices to protect its lush forested coastlines and quaint fishing towns. However, state authority is limited by a common law based on a 17th century colonial ordinance that allows for private ownership of coastal land. Over 93% of Maine's peaceful

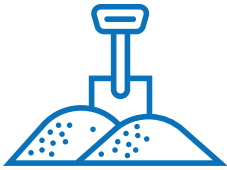
and serene shoreline is privately owned, much of this with public access but only at the permission of property owners. Although Maine's score has decreased since last year, simple recommendations and policy alterations could significantly increase the grade, and more importantly, coastal resilience.



BEACH GRADE

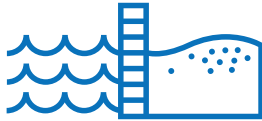
B

Good, but can be improved.



Sediment Management: **OK**

The state has been creating a sediment management plan since 2006. While the 2017 updated report on developing an integrated beach management program highlights some progress, this overall process is slow moving and recommendations do not include a thorough assessment of environmental impacts or monitoring. Fortunately, the state has been implementing a shoreline change monitoring program for the larger beach systems. This data is used to help understand sand migration along Maine's beaches and in the vicinity of dredging and beach fill projects.



Coastal Armoring: **OK**

Almost half of Maine's beaches are armored to control coastal erosion. Although previous policies failed to protect beaches from hard structures, Maine now has a very strong coastal armoring policy. New seawalls on any beach in the state are prohibited and the repair of grandfathered seawalls require a permit if more than 50% of the structure is being altered. The state properly prioritizes the use of living shorelines, has successfully executed several projects and also hosted a 2018 Living Shorelines Conference and Workshop. The only downfall is the state's policy to allow emergency permitting without explicit removal requirements.



Development: **OK**

Maine has statewide minimum setback regulations and allows local municipalities to establish additional land use controls. Unfortunately, the *Act Regarding Reconstruction of Residential Structures on Sand Dunes* was enacted in 2013, which makes it possible for a few residential buildings to be moved forward into the frontal sand dunes. This makes the buildings more vulnerable to coastal erosion and sea level rise, and could be detrimental to dune ecosystems.



Sea Level Rise: **Good**

The state provides some excellent resources to map coastal hazards, including sea level rise, marsh migration, storm surge, and flood plains. In addition, resources are available to engage in and educate local communities about risk and preparedness. Although there is not a thorough statewide sea level rise vulnerability assessment or adaptation plan, regions are encouraged to develop their own plans by using the state's provided resources. Quite a few studies are currently underway to assess the vulnerability of the state's stormwater and transportation systems. Maine also conducted an *Adapting to a Changing Climate* report with strong recommendations for adaptation.

Recommendations:

- Finalize and implement the regional sediment management plan and require monitoring for ecological impacts of replenishment projects
- Revoke the 2013 Act that allows coastal development to occur in dune ecosystems
- Develop a repetitive flood loss policy
- Ensure that regions develop thorough adaptation plans that promote managed retreat and soft stabilization methods that increase coastal resiliency
- Increase coordination between regional sea level rise efforts and state efforts and regulations
- Remove allowances for emergency permitting or strengthen the policy by requiring structures to be temporary with strict timelines for removal, restoration, and implementation of an alternative stabilization method

MASSACHUSETTS

NORTHEAST



Massachusetts has an impressive amount of tidal coastline that stretches across 2,819 miles. Its marshes, beaches and offshore islands offer a wealth of coastal recreation opportunities that have attracted visitors for centuries. The state seems to realize the importance of its coastline, as evidenced by some strong coastal management policies

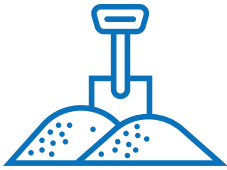
and municipal assistance programs. After severe flooding took place in March 2018, the state did allow for emergency protective devices in order to prevent further environmental and human health devastation during significant storm events. Stringent measures were put in place to qualify for allowances that deviate from the state's normal practices.



BEACH GRADE

B

Good, but can be improved.



Sediment Management: Good

Massachusetts has developed a best management practices guide for replenishment projects, which outlines other exemplary sand replenishment policies in the nation. Projects must 1) assess proximity to shellfish, eelgrass and endangered species habitat; 2) survey beach profiles; 3) include a thorough monitoring and maintenance plan that identifies sensitive resources; and 4) report annually or biannually. The state's Department of Environmental Protection clearly explains permitting requirements and provides links to applications online.



Coastal Armoring: OK

Structural armoring is only allowed on coastal banks if developed prior to 1978 and if an alternative isn't feasible. The state keeps an impressive inventory of nearly all shoreline stabilization structures. An analysis of the condition of publicly-owned structures was last updated in 2015. The state also allocates funds for a Dam and Seawall Repair or Removal program to address failing structures. Although emergency permits for hard armoring were allowed after severe flooding in March 2018, stringent measures help ensure that this allowance does not get overused.



Development: OK

Although there is no statewide coastal development setback standard, Massachusetts has taken a strong stance on avoiding the permitting of construction in high hazard areas, such as floodplains. In addition, proposed developments in coastal resource areas are reviewed by local Conservation Commissions and state agencies. While policies against new developments in hazard areas are strong, there are not strong policies in place to discourage the repair of frequently damaged properties already developed in hazard areas.



Sea Level Rise: Good

Massachusetts is a leader in planning for climate change. The state has produced a series of important documents, including a climate change adaptation report, coastal infrastructure inventory, a state hazard mitigation and adaptation plan and sea level rise flood maps. There are many resources for local communities to assess vulnerability and increase resilience. The Commonwealth also adopted the *Massachusetts State Hazard Mitigation and Climate Adaptation Plan* in September 2018, which supports the Baker-Polito Administration Executive Order 569 and is a first-of-its-kind plan to comprehensively address climate change and natural hazards.

Recommendations:

- Clearly delineate high-hazard areas and prohibit new developments in established areas
- Establish policies for managed retreat, relocation, buyouts and retrofitting; include limits on the amount of repairs permitted
- Codify relocation and managed retreat as enforceable policies
- Establish statewide minimum setback standards to provide a safe buffer between coastal hazard areas and coastal developments
- Prohibit coastal armoring or limit by including conditions such as sunset clauses
- Remove allowances for emergency permitting of coastal armoring, or strengthen the policy by requiring structures to be temporary, with strict timelines for removal, restoration and the implementation of an alternative stabilization method

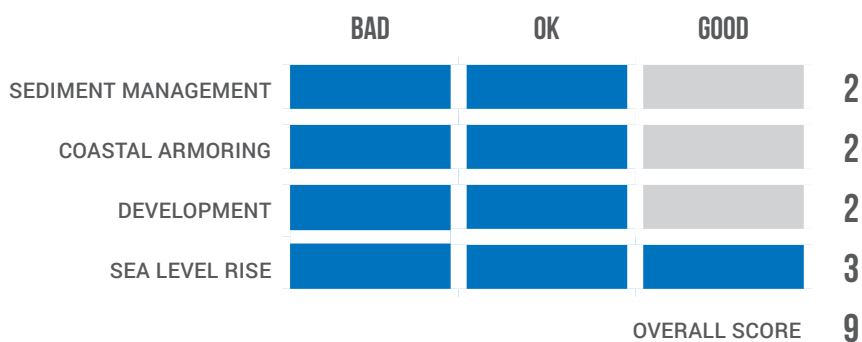
NEW HAMPSHIRE

NORTHEAST



With the shortest coastline of all coastal states, New Hampshire has some impressive management policies. This includes an updated *Inventory of Tidal Shoreline Protection Structures*, and thorough community engagement and education regarding climate change. In July 2018, the state

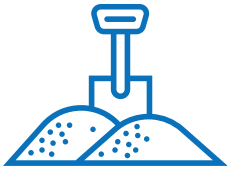
even held a Climate Action Summit to better engage with coastal communities. While New Hampshire continues to make progress in the realm of climate change preparedness, new light has been shed on a relatively destructive policy on development repairs in hazard areas.



BEACH GRADE

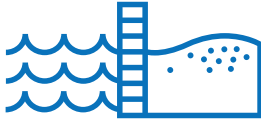
B

Good, but can be improved.



Sediment Management: OK

Although it is not a regional sediment management plan, New Hampshire participated in a federal project to assess offshore sources of sand and gravel. As part of this effort, the New Hampshire Geological Survey (NHGS) created detailed maps of beach erosion and accretion to guide management decisions. This includes some strong criteria for replenishment projects, such as identification of at-risk species and 50-foot setbacks from undeveloped uplands and wetlands. Unfortunately, there is no explicit requirement for monitoring ecological impacts.



Coastal Armoring: OK

Living shorelines are promoted over armoring and the state recently completed several 'Smart Shorelines' projects to protect against erosion. The state won't approve seawalls unless the applicant has proven that no other option is practical. Seawalls themselves are required to meet specific standards, including angular texture and weep holes. Emergency permitting for coastal armoring is available but the policy is designed in a way that avoids misuse. State policies are just missing sunset clauses and required monitoring.



Development: OK

New Hampshire has a statewide setback requirement of 50 feet for all new primary structures in the coastal zone and near protected surface waters, including lakes and streams. In addition, it has a setback standard of 20 feet for 'accessory structures,' such as sheds. The use of a dynamic reference line ensures that the buffer is receptive to changing sea levels. Unfortunately, the state allows for the repair and rebuilding of any structure damaged 'accidentally,' including in coastal hazard areas, instead of requiring that structures are moved or built to a higher standard.



Sea Level Rise: Good

New Hampshire has some great resources available for residents to learn about climate change. The New Hampshire Coastal Adaptation Workgroup held a 2018 climate action summit to further engage communities. Much of the state's progress is due to bipartisan legislation that established a committee to develop policy guidance, in addition to recommendations to manage and prepare for coastal hazards. A 2016 bill further strengthened the state's efforts to prepare for sea level rise. The bill requires several agencies to evaluate whether policies need to be altered to better enable adaptation to sea level rise, extreme precipitation changes and storm surge.

Recommendations:

- Develop a statewide climate change adaptation plan (or require each region to develop their own)
- Create policies for buyouts and relocation for development facing repetitive coastal damage
- Develop plans for managed retreat in light of sea level rise and coastal erosion
- Adopt University of New Hampshire recommendations regarding forest management in riparian areas to help with future coastal migration inland during sea level rise
- Develop a regional sediment management plan and include required environmental monitoring before and after beach nourishment projects

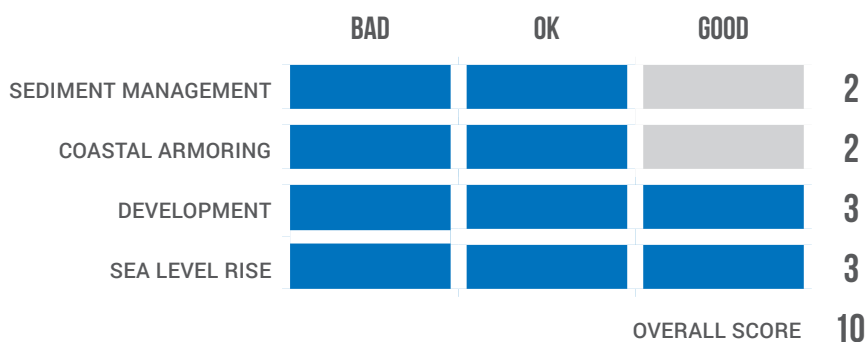
RHODE ISLAND

NORTHEAST



Though small in acreage, the aptly named Ocean State continues to be a leader in coastal climate change planning, releasing a well done *Shoreline Change Special Area Management Plan* (SAMP) in June 2018. The SAMP provides strong guidance for state and local decision-makers to prepare for and recover from coastal hazards.

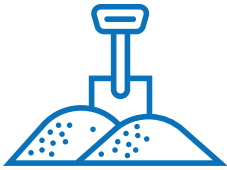
Local jurisdictions and state agencies now just need to adopt the recommendations and start implementation. While the state is on its way to being prepared for intensified coastal hazards, it would benefit from more focused sediment management policy and the reduced use of emergency permits for coastal armoring.



BEACH GRADE

B

Good, but can be improved.



Sediment Management: OK

Beach replenishment projects are allowed and even encouraged. However, Rhode Island only adds sand on public beaches after a complete review by both the Department of Environmental Management and the Coastal Resources Management Council. Potential ecological, sedimentation, public access and other impacts are assessed prior to any project. Rhode Island can improve sediment management by requiring the monitoring of ecological impacts from sand nourishment and by developing regional sediment management plans.



Coastal Armoring: OK

Rhode Island has strong policies that discourage coastal armoring and require the consideration of non-structural erosion methods, including relocation, prior to any hard stabilization application. The applicant must ensure that any armoring is not likely to exacerbate erosion. They must also have the structure certified by a registered engineer and provide a long-term maintenance and funding program. The only downfall is that there is an exemption for emergency permitting of coastal armor without explicit requirements that armor must be temporary and later replaced with living shorelines.



Development: Good

Coastal land in Rhode Island is well-protected with established coastal buffer zones and significant statewide mandatory setbacks. These protections reduce the hazards of coastal erosion and preserve ecological systems. All development within 200 feet of shoreline features, such as beaches, wetlands, bluffs and rocky shores, require a permit. Development on dunes is also prohibited. The repair and rebuilding of a coastal structure requires a Certificate of Maintenance if minor. A permit is required if more than half of the structure gets damaged.



Sea Level Rise: Good

Rhode Island continues to progress in the realm of climate change preparedness and resilience. The state released the 2018 *Shoreline Change Special Area Management Plan*, which includes ample options and recommendations for adaptation strategies. Vulnerability assessments of Rhode Island's transportation assets, in addition to maps that depict shoreline change, tidal and hurricane inundation, also help to identify potential erosion and sea level rise risk. Rhode Island does not yet have a cohesive statewide plan for dealing with sea level rise and other coastal impacts from climate change. However, adaptation strategies in the SAMP just need to be adopted by local jurisdictions.

Recommendations:

- Place time limits on seawalls and develop a policy to remove or require property owners to remove derelict structures
- Remove allowances for emergency permitting or strengthen the policy by requiring structures to be temporary, with strict timelines for removal, restoration and the implementation of an alternative stabilization method
- Require local jurisdictions to implement the adaptation plan using the beach SAMP guidelines
- Include thorough analysis of sand replenishment projects and monitor ecological impacts in permitting requirements
- Develop regional sediment management plans
- Refer to seawalls as a temporary solution while property owners make long-term plans for erosion preparation



MID-ATLANTIC

DELAWARE

MARYLAND

NEW JERSEY

NEW YORK

VIRGINIA

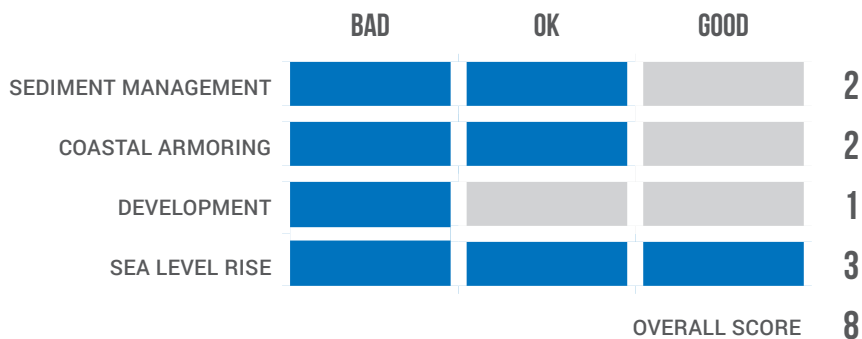
DELAWARE

MID-ATLANTIC



Delaware's low-lying marshes, tree groves, sandy beaches and quaint coastal towns are well-known attractions for tourists, fisherman, birders and crabbers. The sandy beaches along the eastern coastline, and the swamplands at the state's southern border provide critical habitat for migrating

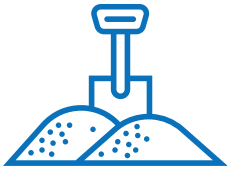
birds. The tidal salt marsh at Bombay Hook National Wildlife Refuge is a true gem of the state. Unfortunately, Delaware has allowed quite a bit of coastal development and needs to improve how new development is permitted.



BEACH GRADE

C

Mediocre.



Sediment Management: OK

While the state does not have a concrete sediment management plan, there are several regional plans, such as the *Management Plan for the Delaware Bay Beaches*, that are well-thought-out. Beach fill projects are a primary method of erosion control. The Division of Soil and Water Conservation assesses beach replenishment needs by monitoring beaches statewide and measuring sand loss. While the state requires permits for beach fill, there is a lack of codified policy around beach nourishment.



Coastal Armoring: OK

Permits are required for armoring projects and the state encourages alternative stabilization methods, including retreat. Delaware considers living shorelines to be 'best management practice' and has implemented several projects in the Delaware Bay and the Delaware River. In addition, illegal seawalls must be removed and fines are administered. Unfortunately, Delaware has vague policies on repairing seawalls and frequently allows emergency permits.



Development: Bad

While the state does have a minimum setback policy it needs to be updated to reflect long-term annual erosion rates. In addition, Delaware has minimal restrictions on coastal zone industrial and residential development. For example, from 2010-2016 the state allowed nearly 800 new homes to be constructed in areas prone to coastal hazards and flooding. Finally, the state lacks strict regulations for repairing properties located seaward of the building line.



Sea Level Rise: Good

Despite having lackluster development standards, Delaware has made remarkable strides to address sea level rise. The state produced a sea level rise vulnerability assessment, conducted by the Sea Level Rise Advisory Committee, which identifies at-risk properties. In addition, the state developed the document, *Recommendations for Sea Level Rise in Delaware*, which provides methods for municipalities and communities to prepare for and respond to sea level rise. The state has also been active with adaption planning. Under an Executive Order, eleven state agencies developed a total of 155 recommendations for climate adaptation actions.

Recommendations:

- Develop a statewide beach management plan to clarify requirements for beach replenishment permit applications and monitoring of ecological impacts from projects
- Clearly state armoring permit requirements
- Establish time limits on seawalls
- Develop a more thorough enforceable policy that promotes non-structural alternatives for shoreline stabilization
- Prohibit any weakening of development setback requirements
- Use dynamic reference points for development setback requirements
- Establish strict regulations that prohibit the construction and repair of properties located seaward of the building line

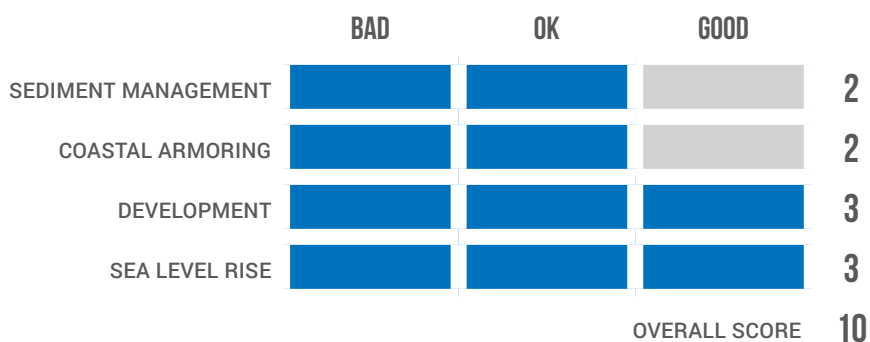
MARYLAND

MID-ATLANTIC



Maryland's coastlines range from beautiful sandy beaches and lush coastlines, to historic cities and bustling harbors. The coastal management program is effective at overseeing the state's coastal zone, which accounts for the majority of the state's land area and two-thirds of the population. Beyond having strong development setbacks and restrictions

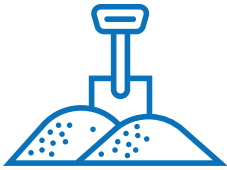
on hard shoreline structures, the state continues to address vulnerability to climate change by identifying hazards, increasing coastal resiliency and even releasing a 2018 *Coastal Atlas Mapping Tool* to spatially depict coastal uses and hazard areas.



BEACH GRADE

B

Good, but can be improved.



Sediment Management: **OK**

Maryland is one of the few states that promotes the use of relocation before considering beach fill. It also has strict requirements to ensure that fill projects can only occur if there is proper sediment grain size, evidence of erosion, and it is determined that at-risk species will not be adversely affected. While there is no regional sediment management plan, sedimentation is prevented through an inland-focused soil erosion and sediment control plan. Unfortunately, pre- and post-beach fill monitoring is not required for each project, as it is only encouraged.



Coastal Armoring: **OK**

Coastal armoring is discouraged in general, and even prohibited seaward of the dune line on Maryland's Atlantic coast. Non-structural shoreline stabilization measures, including living shorelines, are codified requirements for addressing shoreline erosion. Waivers must be obtained for armoring projects, and an approved sediment and erosion control plan may also be required. Unfortunately, there are no time limits on approved seawalls or revetments, even for those constructed with an emergency permit, and property owners are allowed to repair bulkheads without a permit.



Development: **Good**

Maryland has a statewide minimum setback of 100 feet from tidal waters and wetlands, and 200 feet in undeveloped coastal areas. There is a thorough permitting process for constructing near the shore. There are also strong policies to maintain the natural coastal environment, including the protection of wildlife corridors and the clustering of development. To protect native vegetation, there are strict policies regarding buffers and local jurisdictions are required to submit their own *Buffer Management Plans*. The only missing aspect appears to be additional protections for sand dunes.



Sea Level Rise: **Good**

Maryland has been proactive at assessing coastal climate change impacts and developing adaptation strategies to increase coastal resiliency. The state conducted a thorough vulnerability assessment, a *Sea Level Rise Response Strategy*, a *Coast Smart Construction* guidebook and a *Comprehensive Strategy for Reducing Maryland's Vulnerability to Climate Change*. The strategy has good policy recommendations and an adaptation and response toolbox to help local governments with implementation. Many of the recommendations have already been implemented by the state.

Recommendations:

- Encourage the use of regional sediment management plans
- Require the monitoring of sand replenishment projects for effectiveness and ecological impacts
- Establish clear time limits and removal requirements for any approved seawalls or revetments
- Develop a repetitive flood loss policy (including plans for buyouts and relocation) in case of extreme weather events
- Develop policies that ensure stronger protection for coastal dunes
- Discourage the repair of bulkheads and, when necessary, require permits for repair
- Remove allowances for emergency permitting or strengthen the policy by requiring structures to be temporary, with strict timelines for removal, restoration and implementation of an alternative stabilization method

NEW JERSEY

MID-ATLANTIC



New Jersey has much to offer beachgoers, including warm summer water temperatures, entertaining boardwalks, and plenty of ocean recreation opportunities. The beach communities are quaint and charming. However, hundreds of towns along the coast are making individual land use decisions without stringent permitting requirements and

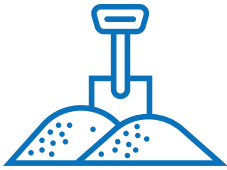
monitoring plans. Unfortunately, coastal preservation has taken a back seat. Though the Garden State's shorelines are currently warm and welcoming, lax coastal development regulations put the coast and communities at risk, with 62,000 homes and properties at risk to sea level rise by 2045.

	BAD	OK	GOOD	
SEDIMENT MANAGEMENT	<div></div>	<div></div>	<div></div>	1
COASTAL ARMORING	<div></div>	<div></div>	<div></div>	1
DEVELOPMENT	<div></div>	<div></div>	<div></div>	1
SEA LEVEL RISE	<div></div>	<div></div>	<div></div>	1
			OVERALL SCORE	4

BEACH GRADE

F

Inadequate protection of coastal communities and resources.



Sediment Management: **Bad**

New Jersey lacks any regional sediment management plans and relies far too heavily on beach fill. In the past 30 years, more than a billion dollars have been spent on beach replenishment projects. The state has a special fund, called the Shore Protection Fund, that is used for beach replenishment projects. New Jersey has some policies that dictate beach fill, such as matching grain size. However, for the most part, the state regulates fill as a 'non-structural shoreline protection measure' without strict permit requirements and monitoring plans.



Coastal Armoring: **Bad**

New Jersey has few regulations on coastal armoring. In fact, seawalls and other hard structures are considered 'essential' to protect the shoreline and urbanization. In addition, there are few restrictions on repairing or replacing armoring, and a permit is only needed if there are 'significant' improvements. The state is also lenient with emergency permits and requires very few restrictions. The permit request can even be done over the phone. Instead of making living shorelines accessible and easy, the state manual is wonky and not very user-friendly for local communities.



Development: **Bad**

Over the past decade, the state and local municipalities have approved a significant amount of new development. In fact, a recent report by Zillow concludes new home development was three times higher in the 'coastal risk zones' than in safer areas. This type of development is clearly skirting requirements of the *Coastal Area Facility Review Act*. While the state requires the elevation of homes destroyed in a flood zone, the permitting process is lenient and elevation requirements are only one foot above a flood area. In addition, New Jersey needs to improve its setback policies. For example, residences on coastal bluffs are only required to be 'set back' 10 feet from the crest of the bluff.



Sea Level Rise: **Bad**

In 2018, New Jersey made progress regarding work on climate change. The New Jersey Department of Environmental Protection hosted a Coastal Resilience Summit where regional, state and national leaders gathered to plan for climate change impacts. While New Jersey doesn't have a statewide sea level rise policy, the state has conducted vulnerability assessments and produced resources for local communities to evaluate their vulnerability. Unfortunately, poor development standards have led to an overdeveloped coast, which will make sea level rise planning extremely challenging. Finally, because the state has been slow to act on climate change, it is behind in producing adaptation plans.

Recommendations:

- Improve compliance with the *Coastal Area Facility Review Act*
- Reduce the reliance on, and use of, sand replenishment and consider other methods of beach preservation
- Acknowledge the negative effects of shoreline armoring and prohibit or severely limit their use
- Improve rebuilding standards after storms and increase home elevation in flood zones
- Prohibit new developments in known hazard areas
- Prohibit the use of armoring for new or repaired buildings
- Establish larger setback standards
- Develop sea level rise adaptation plans
- Establish managed retreat policies

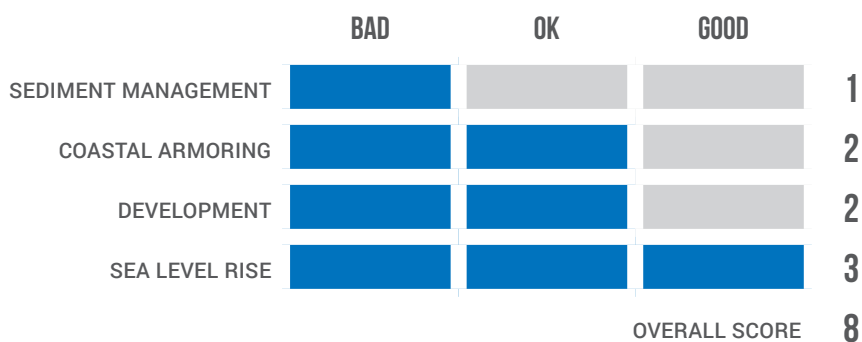
NEW YORK

MID-ATLANTIC



New York's iconic beaches and coastal communities include special places like the Montauk Lighthouse, the Rockaways, Coney Island, beaches of Long Island Sound and the thin barrier islands of Fire Island. New York has mediocre regulations in place to protect these remarkable beaches and coastal communities. The state could improve

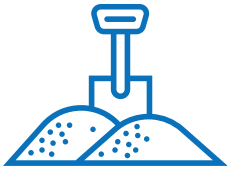
its coastal armoring activities and reliance on beach fill. This year, New York lost a point in the coastal development section because upon closer review, the permit requirements for repairing development in coastal hazard areas are relatively loose and should be more stringent (see the following recommendations).



BEACH GRADE

C+

Mediocre.



Sediment Management: Bad

New York does not have a statewide sediment management plan and any management activities largely focus on dredging. While the state has a beach replenishment policy, it is not nearly strong enough. In fact, the state relies heavily on replenishment as the go-to shoreline stabilization method, despite the practice being costly and short-term. While the state is working with the Army Corps to establish erosion management policies and regional plans, there has been little progress on establishing plans.



Coastal Armoring: OK

While the state has policies on limiting shoreline stabilization structures in sensitive areas, there are no policy restrictions on rebuilding coastal armoring. There are strong policies to promote soft or natural approaches to shoreline stabilization. However, after Hurricane Sandy, the state issued a General Permit for coastal armoring for Long Island and New York City. General Permits are problematic because they do not thoroughly analyze environmental impacts. Unfortunately, the state is considering building a floodgate across New York Harbor to Sandy Hook, New Jersey, that would have major environmental impacts.



Development: OK

New York has policies to protect natural resources that provide coastal hazard mitigation benefits, such as dunes, wetlands and reefs. Unfortunately, the state allows the restoration of damaged structures without a permit. Since Hurricane Sandy impacted the area in 2012, some development standards have been improved. However, New York allows exemptions to setback policies during the permitting process for new construction.



Sea Level Rise: Good

The state has conducted a vulnerability assessment and has sea level rise mapping. In addition, the state encourages adaptation planning and also aims to protect habitats that will allow for potential sea level rise, such as the rivers leading to Hudson Bay. After Hurricane Sandy, several commissions were created to study impacts from climate change and sea level rise. Finally, the Buyout and Acquisitions Program increases coastal resiliency by purchasing infrastructure and land to create natural coastal buffers that can better weather future storms.

Recommendations:

- Encourage regional sediment management plans
- Strengthen the beach replenishment policy to require strict monitoring requirements and a maximum on the amount of times replenishment can occur in a certain time period
- Require rigorous permits for the reconstruction of damaged homes
- Avoid exceptions to setback requirements
- Develop policy restrictions regarding rebuilding coastal armoring and remove the General Permit for coastal armoring in Long Island and New York City
- Develop stronger funding mechanisms for 'buyout' programs
- Do not build a floodgate in the New York Harbor

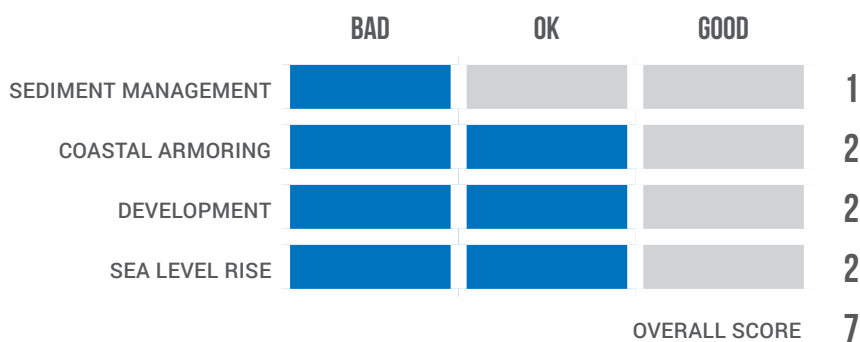
VIRGINIA

MID-ATLANTIC



With over 60% of the state's population living in the coastal zone, Virginia has managed its lush coastline pretty well. There are strong coastal reconstruction policies, impressive repetitive flood loss buyout programs (supposedly 400 buildings were removed in 2018), and the state's coastal resources are protected by solid legislation. A recently released *Hazard Mitigation Plan* thoroughly identifies hazards

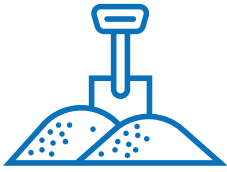
for the state, especially regarding flood risks. Unfortunately, the plan does not include a sea level rise vulnerability assessment or provide adaptation recommendations. In addition, Virginia's seemingly strong shoreline stabilization policies allow too many exemptions and the state is missing a beach replenishment policy.



BEACH GRADE

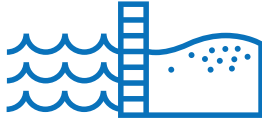
C

Mediocre.



Sediment Management: Bad

While the state frequently conducts sand replenishment projects, there are no regional sediment management or beach nourishment plans. Permit requirements for replenishment projects are unclear and differ by city. There are also no identified restrictions or requirements to assess the effectiveness and impacts of nourishment projects, which can have severe impacts on coastal wildlife and nearshore ecosystems. The state would benefit from the review of individual replenishment projects and the development of regional sediment management plans that thoroughly assess ecological impacts.



Coastal Armoring: OK

The *Coastal Primary Sand Dune and Beach Act* seemingly offers strong protection for coastal beaches and dunes. Shoreline hardening is prohibited, including seawalls, riprap, revetments, gabion baskets, sandbags, groins and jetties. However, exemptions for the Sandbridge Beach Subdivision and emergency permits allow the construction and repair of armoring, which reduces the effectiveness of what would be an excellent armoring policy. As an alternative method, the state promotes living shorelines and more recently, buyout programs.



Development: OK

Virginia has the foundations for a strong coastal development policy, including codified protections for sand dunes, restrictions on development in coastal areas and restrictions on the repair of buildings damaged from coastal storms. Under the Dune Act, repairs require a new permit. If structures are unsalvageable, they must be removed and the area restored. In addition, coastal developments adjacent to dunes are limited to single-family dwellings to facilitate the ability of dunes to migrate inland. However, there is no statewide minimum development setback standard, as these are determined on a case-by-case basis during permitting.



Sea Level Rise: OK

Virginia completed a *2018 Hazard Mitigation Plan* to thoroughly identify coastal risks. The plan establishes an impressive property acquisition program to move people out of flood zones, already resulting in the removal of 400 properties. The *Resilient Virginia* program offers good public outreach and communication about climate change. The state has also been proactive in protecting habitat connectivity and wildlife corridors. However, the state has still has not conducted a thorough sea level rise vulnerability assessment, which will be necessary to guide coastal adaptation efforts and the eventual development of an adaptation plan.

Recommendations:

- Develop regional sediment management plans to prevent runoff and sedimentation of waterways
- Develop beach nourishment policies that thoroughly assess ecological impacts
- Review each individual replenishment project before permitting
- Establish a statewide minimum development setback standard
- Reestablish the Climate Change Commission
- Conduct a statewide sea level rise vulnerability assessment to identify management priorities
- Generate a comprehensive and specific adaptation plan with clear actionable items and policy recommendations
- Promote the use of managed retreat plans and expand the buyout and/or relocation program for repetitive loss due to coastal hazards
- Strengthen policies protecting riparian buffers and wildlife corridors



SOUTHEAST

FLORIDA

GEORGIA

NORTH CAROLINA

SOUTH CAROLINA

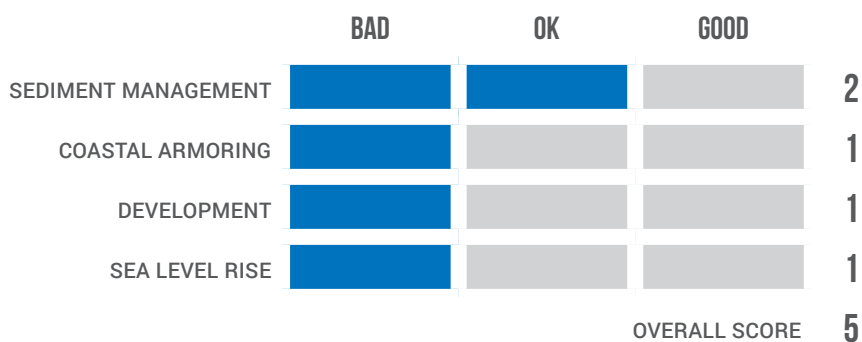
FLORIDA

SOUTHEAST



Florida's white sandy beaches, lush everglades and beautiful Gulf Coast shorelines make this state a popular vacation destination. Unfortunately, the state lacks sufficient coastal management policies to protect these amazing beaches from erosion and climate change. Increasingly, coastal development regulations are haphazardly implemented because decision-makers have created loopholes that negate

major protective policies. Despite South Florida experiencing increasingly regular flooding events, there are no repetitive flood loss policies and there is no statewide sea level rise planning. Fortunately, some local governments have taken matters into their own hands and are working to build resilient communities despite the lack of state leadership.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: OK

Florida has a beach management plan that takes into account sediment budgets, inlet management and beach replenishment projects. However, the state relies heavily on sand replenishment, often at the expense of more progressive alternatives to erosion response. In addition, the *Beach Management Funding Assistance Program* gives priority to beaches with good public access.



Coastal Armoring: Bad

Despite a statewide policy restricting armoring in certain areas, the *Beach and Shore Preservation Act* explicitly allows exemptions and does not require the property to be a 'habitable structure' in order to obtain a shoreline protection structure permit. Furthermore, the repair of private seawalls and riprap does not require a permit. The state is also lenient on giving out emergency permits. Finally, while the state has living shorelines listed on the Department of Environmental Protection website, there is no explicit policy or practical steps on how to implement a living shoreline.



Development: Bad

While Florida has some good regulations on the books to guide development, the state has allowed loopholes for new construction to match the existing 'line of construction.' The state also allows any new single-family home to be built seaward of the line of construction. To compound the situation, some municipalities will allow expedited permits to build a seawall for the newly constructed 'vulnerable' property. Fortunately, Florida has some good regulation to protect wetlands from new development.



Sea Level Rise: Bad

Florida has been slow to act on sea level rise or climate change, which is unfortunate as Florida is currently experiencing the impacts of climate change. However, in April 2018, the Department of Environmental Protection issued a new report outlining the impacts of climate change to Florida. While it is encouraging that at least one agency at the state level is recognizing these impacts, most of the work to combat climate change is taking place at the local level. In fact, the *Southeast Florida Regional Climate Change Compact* is a very progressive approach that ought to be adopted at the state level. Finally, similar to New Jersey, an overdeveloped coastline means that there is little space for rising tides or the landward creep of the ocean.

Recommendations:

- Reduce reliance on and frequency of sand replenishment
- Establish statewide restrictions on shoreline armoring and remove exemptions from the rule
- Prohibit seawalls or coastal armoring for new developments
- Remove exemptions that allow any development seaward of the minimum development setback line
- Update and implement inlet management plans so there is no net loss of sand (as most coastal erosion is caused by the state's many engineered navigational inlets)
- Create new policies that incentivize the landward siting of new coastal development
- Implement post-disaster redevelopment policies that prohibit building in the same vulnerable locations after storms
- Establish coastal land acquisition programs through direct purchase or conservation easements
- Reform the state's 25 year old coastal development laws that allow development on the frontal dunes of critically eroding beaches

GEORGIA

SOUTHEAST



Georgia's Atlantic coastline is rather short, but there are quite a few picturesque islands and coastal marshlands, in addition to the popular tourist destination and historical coastal city of Savannah. While the state's coastal management policies continue to be severely lacking, the coastal city of Tybee Island has taken matters into its own

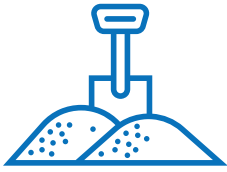
hands. As the only Georgia town with a Beach Management Plan and a sea level rise adaptation plan (with mapping of vulnerabilities), Tybee leads Georgia communities in planning for the impacts of climate change. State policies would do well to follow Tybee Island's leadership.



BEACH GRADE

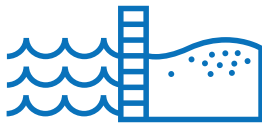
F

Inadequate protection of coastal communities and resources.



Sediment Management: **Bad**

Georgia encourages the development of sediment management plans but only Tybee Island has completed a comprehensive *Beach Management Plan*. While the state is heavily reliant on beach nourishment, Tybee has pre-approval to conduct nourishment every six years, with funding from the federal government. Although the plan provides guidelines for careful beach nourishment practices, these are only recommendations. There is a five-year monitoring program after each nourishment but the focus is more on efficacy and not ecological impacts. While sand replenishment projects must have a permit, the requirements for approval are rather lenient.



Coastal Armoring: **Bad**

Guidance documents seem to encourage non-structural approaches to shoreline stabilization but the state's codified policies and actions appear to tell a different story. Groins and jetties are included as a 'first alternative' method, along with dune restoration and nourishment. While there are some policies for limiting coastal armament, hard structures are still permitted and smaller stabilization projects are allowed without a permit. During state-declared emergencies, construction of coastal armoring can occur immediately and without a permit. However, all hard stabilization structures may only be temporary and developers are required to completely restore the area after they are removed.



Development: **Bad**

Policies under the Shore Protection Act offer some protection for coastal habitats and infrastructure. They prohibit development on eroding sand dunes and beaches, require ample retention of natural vegetation and also require construction to follow 'applicable hurricane resistant standards.' Clarification of these standards is needed, in addition to requirements that damaged buildings are moved or built to a higher standard. Unfortunately, Georgia allows developments on sand dunes and only has a development setback from coastal marshlands.



Sea Level Rise: **Bad**

Georgia's Hazard Mitigation Plan dismisses sea level rise as 'not an immediate natural hazard,' despite nearly 40% of its coast currently exposed to sea level rise and increased coastal hazards. The state does not have a climate change adaptation plan or vulnerability assessment. Only the coastal town of Tybee Island has taken the initiative to develop a sea level rise adaptation plan, which properly focuses on retrofitting, establishing repetitive loss policies, and elevating structures. However, these are only recommendations and there is no implementation plan.

Recommendations:

- Only allow armoring if all other methods have been attempted, including managed retreat, dune restoration and wetland protection
- Establish a minimum development setback requirement from all coastlines
- Prohibit development on unstable dunes
- Require permits for any redevelopment of damaged structures in known hazard areas and require rebuilds to construct to a higher resiliency standard farther back from the shoreline
- Acknowledge climate change as an immediate threat and provide information on government websites
- Conduct sea level rise vulnerability assessments for coastal areas outside of Tybee Island and develop a climate adaptation plan
- Develop regional sediment plans for Savannah and the minor outlying islands
- Codify the beach nourishment guidelines identified in the *Tybee Island Beach Management Plan*
- Include ecological monitoring (including species distribution and counts) during the five-year monitoring program conducted after each nourishment on Tybee Island

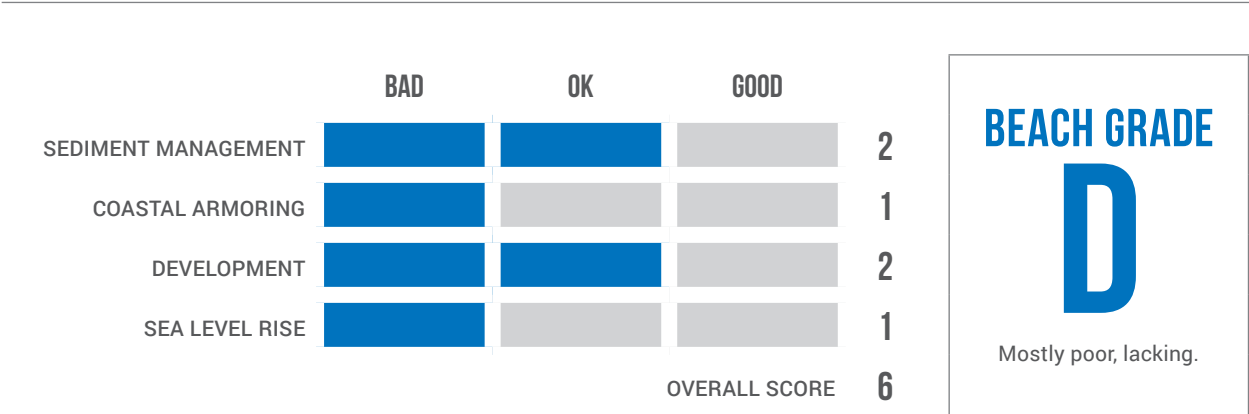
NORTH CAROLINA

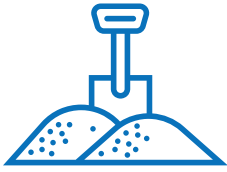
SOUTHEAST



North Carolina’s white sand beaches, charming coastal towns and Outer Banks islands are some of the more popular East Coast destinations. Without effective planning to address the effects of climate change, including impacts from more frequent and intense storms and sea-level rise, the future of these coastal areas is threatened. In addition, converging freshwater rivers and streams at the coast cause severe flood risk during storms. This was made evident by Hurricane Florence, where floodwaters, polluted with toxic

coal ash and hog and poultry manure, forced millions to evacuate, hundreds of homes to be destroyed and thousands of homes to be damaged. North Carolina committed to joining the Paris climate agreement pledging to cut North Carolina’s greenhouse gas emissions 40 percent below 2005 levels by 2025. While this is helpful for overall climate change mitigation, the state still has much work to [improve laws and policies](#) that protect coastal resources and prepare for sea level rise.





Sediment Management: OK

North Carolina has a comprehensive *Beach and Inlet Management Plan* that addresses erosion and sediment issues. The plan, which was updated in 2016, also tailors management programs to specific regions. The permitting of beach replenishment projects require that there are no adverse environmental impacts. Projects must also meet explicit guidelines, including sediment quality thresholds and the use of seasonal restrictions, to protect marine wildlife. The state can improve by requiring monitoring to determine the efficacy and ecological impact of replenishment projects.



Coastal Armoring: Bad

While North Carolina has strong policies prohibiting coastal armoring, exemptions for temporary sandbag seawalls and resolutions to allow terminal groins have severely weakened the effectiveness of these policies. The exemption for sandbag seawalls has resulted in many beach communities overusing this method. In addition, a 2017 ruling removed mandatory time limits so this maladaptive method can continue to exacerbate erosion and keep buildings in harm's way.



Development: OK

There are statewide setback standards for ocean hazard areas, determined by structure size and regional erosion rate, with the minimum setback at 60 feet. While the rebuilding of damaged structures in hazard areas is allowed, regulations require that reconstructed buildings meet current standards. Unfortunately, a 2016 ruling repealed the *Protective Dune Ordinance* at Topsail Beach, weakening dune protections and increasing flood risk for the town, which experienced severe damage during the 2018 hurricane season. In addition, recent county-level laws were allowed to reduce environmental siting requirements for the more intensive industrial developments.



Sea Level Rise: Bad

A previous ruling by the state governor outlawed the use of sea level rise projections in coastal planning until 2016, severely delaying and hindering the state's ability to plan for sea level rise and exacerbated storms. The state must develop a sea level rise vulnerability assessment, coastal hazard plan and stronger 'hurricane-resistant' and 'flood-resistant' development standards to protect the health of its coastline and residents. Unfortunately, instead of strengthening flood resistance, the state approved a bill last year that weakened protections for habitat areas that help to provide natural flood control, including riparian buffers.

Recommendations:

- Calculate erosion rates of coastlines in the Sound and require the same development setback policy
- Establish a state policy that prohibits local jurisdictions from allowing developments on coastal sand dunes and explicitly requires the reinstatement of the Protective Dune Ordinance
- Develop stronger hurricane-resistant standards (to handle a category four or above) for all primary residences
- Provide strict monitoring requirements to determine efficacy and ecological impacts of beach replenishment
- Prohibit the use of permanent sandbags as a form of armoring
- Better enforce prohibitions on groins and jetties
- Conduct a sea level rise vulnerability assessment to identify the high-risk areas and structures to prioritize adaptation and mitigation actions
- Implement stronger environmental management policies both inland and at the coast

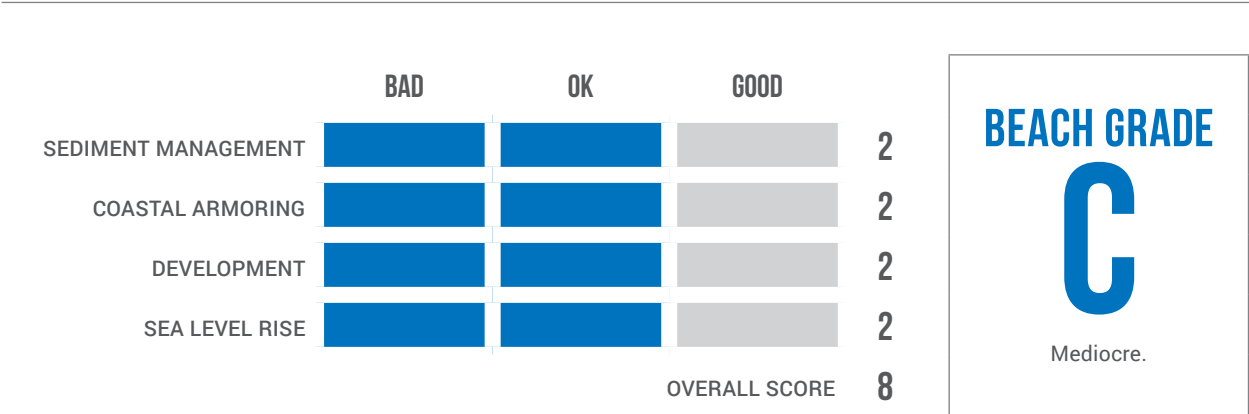
SOUTH CAROLINA

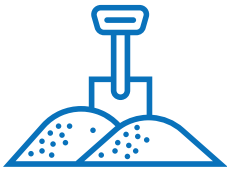
SOUTHEAST



South Carolina’s subtropical beaches are a huge component of the state’s coastal economy and draw millions of tourists annually. South Carolina coastal zone managers seem to be aware of this, as the state has fairly good policies on shoreline structures and sediment management, in addition to impressive requirements for local beach management plans and the implementation of a ‘40-year retreat policy.’

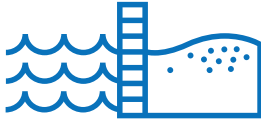
South Carolina has progressed since last year as the state released the *2018 Hazards Mitigation Plan*, which broadly considers sea level rise vulnerabilities. However, thorough adaptation plans, a prohibition on groins and reduced use of beach nourishment, are still needed. These needs are heightened as populations in coastal cities, such as Charleston, experience rapid growth and development.





Sediment Management: OK

South Carolina requires that all coastal governments complete a comprehensive beach management plan. These plans are thorough and include monitoring requirements, in addition to extensive analysis and inventories of erosion and nourishment projects. Beach replenishment is promoted but must be 'carefully planned' and adhere to standards established in each management plan. However, it is still heavily used and relied upon by the state, especially after 2017 and 2018 coastal storms.



Coastal Armoring: OK

South Carolina has some strong policies against armoring. The state completely prohibits the use of new seawalls and mandates that coastal towns adopt a '40-year retreat policy' in their local management plans. Unfortunately, groins are still allowed as long as they have a sediment management plan, which includes the monitoring of sand movement and effects of neighboring property owners. However, strengthening, rebuilding or increasing previously built seawalls is prohibited. Severely damaged seawalls must be removed at the owner's expense.



Development: OK

The development setback standard is 20 feet (or 40 times the average annual erosion rate) from the top of the main sand dune at ocean coastlines. At inlets, the setback requirement is the most landward 40-year erosion point. Unfortunately, the rebuilding of structures that are destroyed due to natural hazards and are located seaward of setback lines, is generally allowed and therefore encourages unsafe development. Coastal dunes and vegetation are recognized as important buffers between developments and coastal hazards. However, the state would benefit from codified policies to ensure the protection of buffers.



Sea Level Rise: OK

The *2018 Hazard Mitigation Plan*, which includes a sea level rise vulnerability assessment, is evidence of substantial improvements in the state's preparation for coastal hazards. Although the assessment is fairly broad, it identifies vulnerable areas and considers sea level rise as a serious threat. The *2010 Climate Change Impacts to Natural Resources in South Carolina* report has good methods to adapt along a changing shoreline. However, none of these adaptation recommendations have been implemented or codified and minimal community awareness or educational resources are provided on state websites.

Recommendations:

- Prohibit the rebuilding of coastal structures seaward of the setback line that were destroyed due to natural hazards
- Require that repairs of coastal structures from storms are restricted, retreated or built to higher standards
- Remove coastal armoring exceptions currently in place
- Develop website with educational resources and guidelines for coastal communities to prepare for climate change and sea level rise
- Conduct a thorough sea level rise vulnerability assessment
- Remove exemptions for golf courses to build in coastal hazard areas
- Develop and implement an adaptation plan using outlined policies and management recommendations in the 2010 *Adapting to Shoreline Change* report
- Ensure that management agencies have jurisdiction to adequately enforce regulations
- Establish stronger restrictions on developments in coastal hazard areas and locations seaward of the baseline



ISLANDS

HAWAII

PUERTO RICO

HAWAI'I

ISLANDS



Hawai'i's stunning islands are equally beautiful and unique. From the lush forests of Kaua'i and the awe-inspiring active volcano on the Big Island, to the epic surf on the north shore of O'ahu, Hawai'i has its work cut out in order to protect so many diverse coastal resources. The state relies heavily on

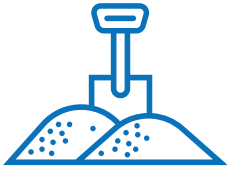
beach fill and lackadaisical enforcement efforts make what would be fairly strong coastal armoring policies ineffective. Fortunately, Hawai'i is making huge strides in planning for climate change.



BEACH GRADE

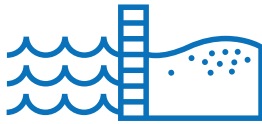
C+

Mediocre.



Sediment Management: OK

While Hawai'i has extensive permitting requirements for beach fill projects, the state continues to rely heavily on sand replenishment as a means of erosion control. The state encourages regional sediment management plans but only a few counties currently have robust plans. Maui, in particular, is far ahead of the curve because the county has conducted a 'sediment budget' analysis and a beach management plan.



Coastal Armoring: OK

Hawai'i has regulations that prohibit erosion protection structures but the state is lackadaisical about enforcement. In fact, local homeowners on Oahu's North Shore are constructing illegal seawalls and the state has yet to correct the situation. Moreover, there are no restrictions on rebuilding and repairing a shoreline protection device. In addition, many counties allow for emergency shore protection with seawalls. While the state needs to improve their management coastal armoring projects, the Ocean Resources Management Plan outlines important measures to avoid armoring, such as managed retreat and restoration.



Development: OK

Hawai'i has substantive development standards. The state has a coastal minimum development setback line of 20 feet from the shoreline. Both Kaua'i and Maui have Beach Management Plans and established a development setback line of 70 times the erosion rate, plus a range of 40 to 400 feet from sandy shorelines, depending on development type. Hawai'i has policies to protect natural resources, such as dunes, wetlands, watersheds and reefs, that 'provide coastal hazard mitigation' benefits. However, the state primarily focuses on reefs and other protections are based on support from the federal government.



Sea Level Rise: OK

In 2018, Hawai'i greatly advanced their efforts to address sea level rise and climate change. The state conducted an in-depth study to analyze future sea level rise and provide recommendations for adaptation. This report complements the state's solid work on sea level rise planning. This includes completed vulnerability assessments, maps and the establishment of the enforceable *Climate Change Adaptation Priority Guidelines*. In addition, the state held a 'managed retreat' symposium in January 2018 and commissioned a study to analyze ways to implement managed retreat in light of sea level rise. Hawai'i would benefit from codified regulations or ordinances that protect lands and provide space for rising tides and landward creep of the ocean. While Hawai'i has recommendations to preserve agriculture and conservation lands, there are no formal state policies.

Recommendations:

- All counties should include the recommendations in the statewide plan and create beach management plans modeled after Maui and Kaua'i
- Reduce the permitting of emergency shore protection with seawalls and hard armoring
- Restrict large-scale development in rural areas
- Dedicate increased funding to the development of climate adaptation plans that incorporate beach and coastal conservation principles
- Establish concrete policies and funds for managed retreat

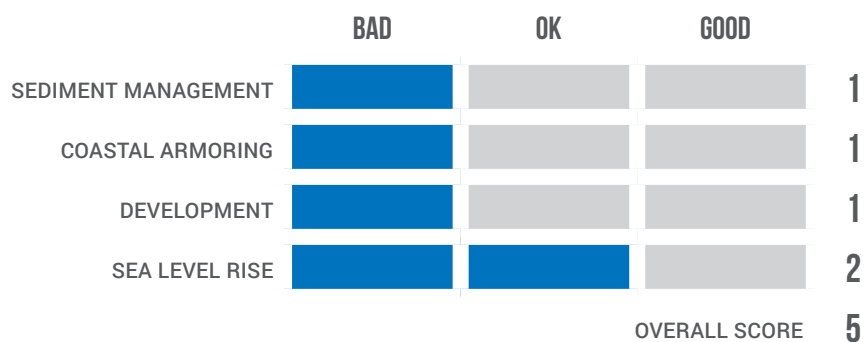
PUERTO RICO

ISLANDS



The lush Caribbean Island of Puerto Rico, including Culebra and Vieques, has about 400 miles of coastline. With 3.4 million residents and 3.7 million visitors annually, there is intensive development pressure on the coast. Outdated infrastructure and weak coastal management policies have caused exacerbated erosion and loss of vital natural barriers, including beaches, reefs, wetlands and sand dunes.

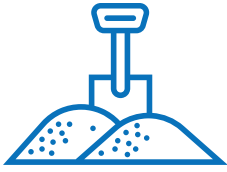
These losses expose local communities to coastal hazards, as was evident with last year's Hurricane Maria. Since the storm, the Director of Coastal Zone Management has accurately mentioned the need for stronger policies on armoring and sedimentation, including a complete ban on seawalls, which would be huge step in the right direction.



BEACH GRADE

D

Mostly poor, lacking.



Sediment Management: Bad

Puerto Rico does not have a sand management plan, an inventory of sand resources, policies on beach nourishment standards, an effort to restore natural sediment flow to the coast, or even adequate enforcement to prevent illegal sand mining from occurring at river mouths, beaches and sand dunes. Hillside development and high rainfall are also causing deposition and sedimentation in waterways. While the Director of Coastal Zone Management office has mentioned a need to develop a sediment management plan and conduct large-scale beach nourishment projects, there is no funding currently available to accomplish this.



Coastal Armoring: Bad

The island has no restrictions on the construction or repair of hard stabilization structures. After Hurricane Maria, emergency permits for additional armoring are readily available. While saving homes and buildings is vital, the island needs to implement more long-term planning that offers effective strategies that protect homes and beaches instead of quickly employing short-term, destructive and maladaptive armoring.



Development: Bad

On the surface, the territory has a good island-wide coastal development setback standard of 50 meters, or 2.5 times the building height from the high tide line. However, waivers and exemptions make this policy ineffective. For example, standards can be reevaluated if a lot was approved prior to this legislation, if a builder invests money in 'physical improvements for public use,' or if nearby buildings are also non-conforming.



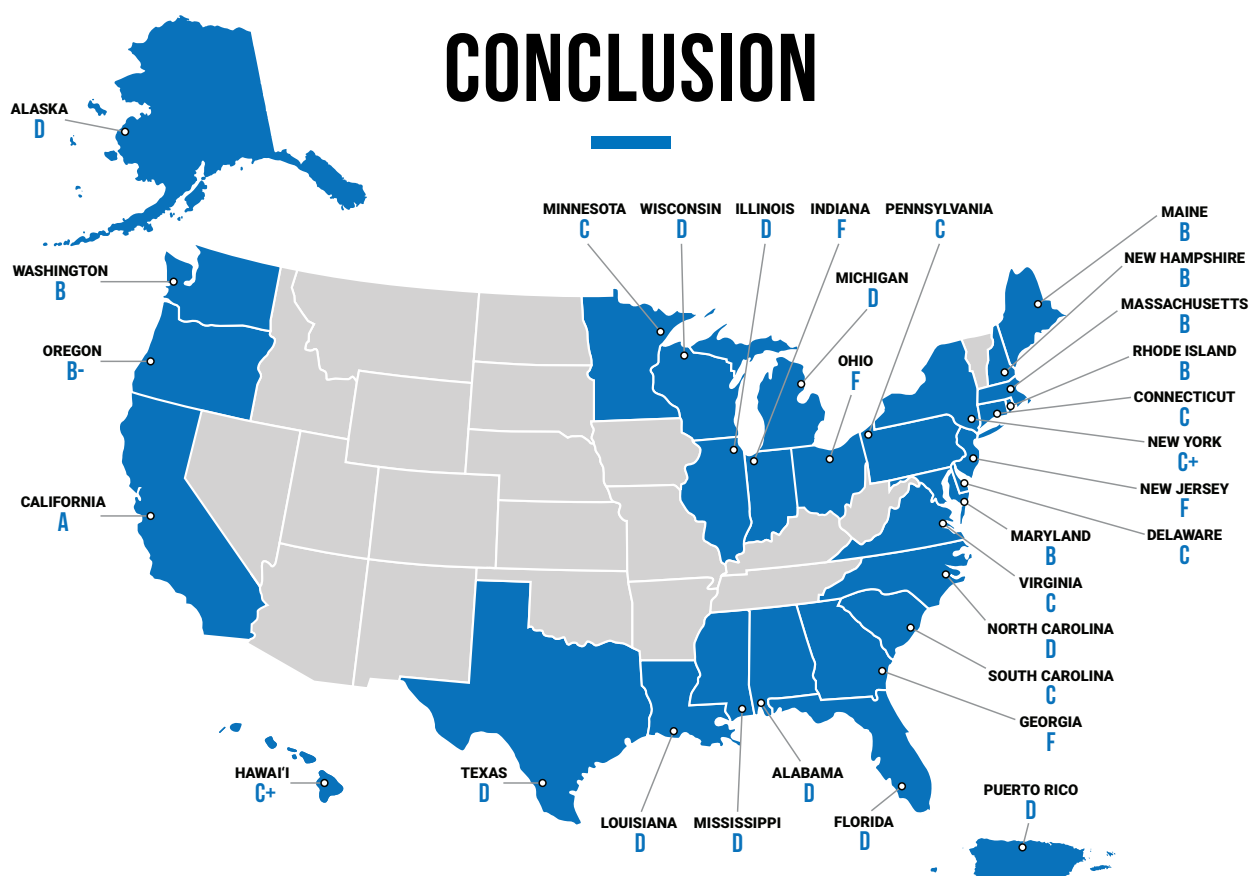
Sea Level Rise: OK

Puerto Rico's Climate Change Council has made good strides toward addressing climate change, establishing topic-specific working groups and developing an assessment of socio-ecological vulnerabilities to climate change. There is ample community outreach and there are even requirements for local communities to develop their own adaptation plans. A more thorough sea level rise vulnerability assessment is needed to inform adaptation plans.

Recommendations:

- Develop a sediment management plan that includes strict requirements for potential beach replenishment projects and restores natural sediment flows to the coastline
- Prohibit waivers and exemptions to the development setback buffer
- Require structures damaged by storms or flooding to be reconstructed to higher standards of resiliency, built farther inland from the coastline, and employ additional property management to reduce flood risk, erosion and runoff
- Prohibit the development and repair of hardened shorelines and promote alternative soft stabilization methods
- Ensure that sea level rise vulnerability assessments and drafted adaptation plans are thorough and promote soft stabilization measures and managed retreat
- Develop a policy that thoroughly protects and restores coastal dunes
- Prohibit repairs on buildings not conforming with setback standards

CONCLUSION



REGION	AVERAGE GRADE
WEST	B
NORTHEAST	B
MID-ATLANTIC	C
ISLANDS	C
SOUTHEAST	D
GREAT LAKES	D
GULF	D

More than half of all people on Earth call the coasts their home. The ocean provides a [primary source of food](#) for more than three billion people worldwide. In the U.S., our ocean and coasts provide products and services worth [2.5 trillion dollars per year](#). However, the cumulative effects of development, extreme weather events and sea level rise are creating long-term problems for our coastal communities.

This State of the Beach Report Card brings to light the essential need for improved coastal management practices to mitigate and reduce the impacts of coastal erosion and sea level rise. Surfrider's findings indicate that many states are not addressing these important issues adequately enough to sufficiently protect our nation's coastal resources. Following is a summary of a few problematic trends and highlighted approaches that coastal communities should adopt to improve shoreline management.

Before elaborating on specific recommendations, it's important to stress that because greenhouse gas emissions are already extremely high, and are the primary source of climate change, it's imperative that states begin to implement laws and regulations to curb emissions. A growing trend is unfolding where cities and states are passing 'carbon neutral' laws. For example, in 2018 both [Hawaii](#) and [California](#) passed legislation to be 'carbon neutral' by 2045, which means that these states and cities *must* shift to renewable energy, per the law. One way to move away from fossil fuels is to implement [Community Choice Energy](#) (CCE) programs where local municipalities chose their energy sources. CCE is the wave of the future, and it's exciting to see local programs rapidly being implemented. Surfrider strongly encourages other states and cities to consider CCE as an option.

COMMONLY USED INEFFECTIVE POLICIES AND PROGRAMS

Emergency Permits for Coastal Armoring and Redevelopment

Emergency permits are problematic because ‘temporary’ seawalls often become permanent and rushed redevelopment permits allow for poor development standards. It is shocking how many local and state agencies hand out ‘emergency’ permits. Even California, with the best grade in the report, appears to indiscriminately give away emergency permits, when these situations are often the result of the lack of advance planning. With climate change creating more threats to our coasts and coastal homes, this practice needs to change. If short-term approaches continue, these coastal developments and their inhabitants will continually be threatened by coastal hazards and our natural coasts will disappear under perpetual armoring and increased rates of erosion.

Lack of Guidance for Local Municipalities

In a perfect world, the best type of governance comes from the local level, which is ultimately where shoreline planning should take place. Local agencies know how to best protect their coastlines and implement policies most effectively. However, many important statewide policies are not being applied locally (this is especially true with development and coastal armoring standards). The ultimate goal for coastal preservation should be to have general or ‘at minimum’ statewide policies implemented and adapted at the local level, as currently modeled by the states of California and Washington. This gives local agencies the opportunity to tailor and execute policies, as long as they meet specific statewide requirements and minimum standards. Without proper guidance from state agencies, local decision-makers appear to not always adhere to core statewide policies, as seen in the states of Oregon, Texas, Florida and Georgia.

EXAMPLES OF EFFECTIVE POLICIES AND PROGRAMS

Going It Alone—the Flip Side of Delegating Local Authority

As some states have not codified important statewide policies, resourceful and determined local municipalities have taken it into their own hands to better protect their coastlines. This is especially true for climate change and sea level rise in states such as Florida, Washington and Illinois. For example, five counties in Florida have joined forces

to create the *Southeast Florida Regional Climate Change Compact* to address and prepare for climate change impacts and sea level rise. Chicago is similarly taking the initiative to respond to climate change erosion, despite the lack of statewide planning. Without clear statewide policies in place, local jurisdictions establish their own, creating a patchwork of policies that is not beneficial to the state as a whole.

Specific Legislation That Bolsters Coastal Protection

Oregon, Washington and California each have clear laws that were established to protect coastal resources and guide shoreline management. In 1976, California passed the Coastal Act. This state law explicitly spells out how local communities should implement coastal policies, set development standards, respond to coastal hazards and improve public access, among many other progressive policies. The Coastal Act is regarded as one of the strongest environmental laws in the nation, and has captured international attention for effectively protecting California’s coastline. This type of comprehensive, proactive legislation would bolster the ability of so many other coastal states to protect coastal resources.

THE NEED FOR FEDERAL INVOLVEMENT

Consistent Federal Policies and Financial Support

As mentioned in the introduction, many states would likely be further along in establishing effective coastal management policies if they received consistent policy and financial support from the federal government. Unfortunately, the Trump administration is cutting necessary funding programs, and important environmental laws and policies are being gutted, removed or not properly used and enforced.

Protection of Established Federal Policies

The federal administration is dangerously rolling back important policies and cutting federal funding for programs that support coastal management and climate change planning. In fact, the Trump administration shut down the only climate change adaptation office in 2017. In 2018, the administration also proposed severe cuts to the budget for NOAA, the lead federal agency responsible for managing our nation’s ocean and coasts, in addition to monitoring weather and climate. The proposed cuts would eliminate funding for a variety of other programs, including research, coastal

management, designation and management of estuary reserves and protection of other coastal ecosystems that provide coastal resilience to major storms and rising seas. In addition, the federal administration signed an executive order to reverse infrastructure regulations set by the previous administration. These regulations required the federal government to account for climate change and sea level rise when rebuilding infrastructure, which would have been critical to ensuring effective rebuilding after the destructive 2017 and 2018 hurricane seasons.

GENERAL RECOMMENDATIONS

The following recommendations will increase our coastlines' natural resilience to coastal hazards, better protect coastal developments and help to ensure that future generations have access to our favorite beaches. These recommendations will benefit all states, regardless of score. They focus on the importance of long-term planning and the need to avoid short-term fixes to larger, pervasive problems.

- Coastal and Great Lakes states must create a uniform minimum 'setback' policy that allows for future sea level rise. Coastal managers need to adapt and implement those setback policies based on current and projected erosion rates.
- All permits for new developments should include building restrictions in coastal hazard areas and sensitive habitat.
- Coastal armoring projects should be restricted in sensitive habitat, have limitations on repairs and be removed if no longer needed and the area restored. When sand is lost due to erosion from a private seawall, a 'mitigation fee' should be charged to the landowner.
- States should encourage the use of soft approaches to erosion, such as living shorelines and strategic sand replenishment, and only allow armoring as a last resort option. In addition, states should invest in "Blue Carbon" projects by planting mangroves, seagrass and kelp to help absorb greenhouse gases.
- As sea level is projected to rise by six feet or more by 2100, states should establish statewide managed retreat policies that provide guidance on relocating infrastructure out of harm's way, especially those coastal properties that are frequently damaged or flooded.
- States should research cutting edge climate change adaptation measures including 'buyout' programs where local and state governments purchase at risk homes, leaving the land vacant to accommodate rising seas. 'Lease back' programs, another innovative adaptation

approach, are when at-risk-properties are acquired by the local governments then leased back to the homeowner until the property is no longer habitable and must be removed.

- In addition, communities can pass local taxes to establish a fund to purchase homes in harm's way. Because extreme weather events and sea level rise are more prevalent, local planners and governments are eager to explore new mechanisms to help local homeowners.
- In order to protect coastal resources and taxpayers, states should establish clear procedures and policies about how to respond to 'extreme weather events.'
- Considering that sea level rise will inevitably be an issue for coastal states, it is imperative that statewide policies are crafted to explicitly instruct local municipalities to plan ahead and develop climate change adaptation measures.
- The granting of 'emergency' permits for areas and structures subject to coastal hazards and flooding needs to be curtailed. If a permit must be granted, stringent conditions should be placed on how long the armoring is allowed to stay in place, what monitoring and reporting will need to occur, and required plans to remove armoring in the future.
- The federal government needs to provide more consistent financial and policy support to states. It is abundantly clear that many states would be further along with coastal management programs if federal partners strategically committed more time and resources to assisting local efforts.

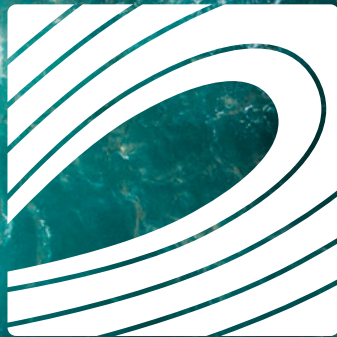
Planning for coastal erosion and sea level rise not only makes sense in terms of land-use planning, but it also saves taxpayers money in the long run. According to the National Institute of Building Sciences, every dollar invested in preparedness and resiliency saves us four dollars in costs down the road. We owe it to American taxpayers and our valuable coastlines to make a conscious decision to proactively protect our coastlines—this logic inevitably protects our communities, ecosystems, habitats and natural landscapes.

With the results and recommendations provided by Surfrider's State of the Beach Report Card, we must work together to increase awareness of the increasing challenges facing our nation's coasts and improve local, state and federal government responses to erosion and sea level rise, to protect our ocean, waves and beaches for the future.

APPENDIX 1. 2018 STATE CRITERIA CHECKLIST

MANAGEMENT POLICY AND PLAN CRITERIA	Y/N	NOTES
SEDIMENT MANAGEMENT		
1. State encourages regional sediment and inlet management plans.		
2. State avoids beach fill projects by promoting and protecting natural sediment flow.		
3. State has sand replenishment policies that thoroughly analyze impacts to coastal resources and efficacy of replenishment.		
4. State requires permits for replenishment, dredge and fill projects.		
COASTAL ARMORING		
1. State restricts or prohibits construction of hard stabilization structures.		
2. State restricts repair and encourages removal of hard stabilization structures.		
3. State encourages non-structural shoreline stabilization alternatives.		
4. State avoids emergency permitting of hard stabilization structures.		
DEVELOPMENT		
1. State has effective development setback policies.		
2. State restricts new developments in coastal hazard areas.		
3. State restricts repairing developments in coastal hazard areas.		
4. State has policies that protect natural resources that provide coastal hazard mitigation benefits (e.g. dunes, wetlands, reefs).		
SEA LEVEL RISE & COASTAL HAZARD		
1. State encourages regional and/or local SLR vulnerability assessment with mapping.		
2. State encourages regional and/or local SLR adaptation plan and implementation plan.		
3. State protects habitat that provide landward creep for wildlife (e.g. riparian areas, habitat connectivity).		
4. State coordinates with municipalities and encourages community outreach.		

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