

STATE OF THE BEACH REPORT

2019



SURFRIDER
FOUNDATION

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INTRODUCTION

Our planet's ocean and coastlines have inspired and sustained humans for centuries. We rely on the ocean for food, transportation and recreation. In fact, more than [half of all people on Earth](#) call the coasts their home. However, global beaches are disappearing at an alarming rate due to the cumulative effects of natural erosion, poor coastal management and an increase in climate change impacts.

The latest climate science and continuing damage from extreme weather events indicate that U.S. beaches will continue to be highly vulnerable to dangerous flooding and erosion. In September 2019, the United Nations Intergovernmental Panel on Climate Change (UN IPCC) released an in-depth [report](#) that details how climate change will impact the world's ocean and coasts. The findings are stark and indicate that without momentous climate action, degradation of the ocean, waves and beaches will only become more staggering and long-lasting.

The UN report emphasized that the ocean acts like a sponge, absorbing over 90% of the heat and nearly 30% of global carbon dioxide emissions, resulting in an ocean that is warmer, more acidic, starved of oxygen and less habitable for marine life. The report warned that global temperature warming must be limited to 1.5 degrees Celsius in order to protect ocean health and coral reef systems. In contrast, the current Paris Agreement goal of a 2 degree Celsius increase in global temperatures will *completely wipe out coral reefs*. The report also indicated that melting land ice, sea ice and glaciers are causing sea levels to rise at an accelerated rate, altering ocean circulation, changing the ocean's chemistry and threatening ecosystems, coastal communities and traditional ways of life around the world.

Finally, the report indicated that coastal flooding will increase as sea levels continue to rise, putting coastal communities and low-lying islands at greater risk. In fact, according to the UN report, extreme sea level events that typically happen once per century, *are projected to occur at least once per year in many locations by 2050*.

The recent climate science makes Surfrider's State of the Beach Report even more meaningful and important as communities must double down on proactively planning ahead in order to deal with impending impacts. In fact, in November 2019, over 11,000 scientists signed on to a "[declaration of emergency](#)" outlining steps that society needs to take in order to avoid a climate crisis.

While it's imperative that local and state communities actively plan for climate change, it is equally important for the federal government to support communities. Unfortunately, the Trump administration is drastically behind the curve when dealing with climate change. On November 6, 2019 President Trump started the official process with the United Nations to withdraw from the [Paris climate agreement](#), making the U.S. the only country to exit the historical pledge made by more than 200 countries to reduce carbon emissions. Not only does the federal administration appear to deny climate science, but during the height of the hurricane season, when local communities were literally underwater, the administration also took [hurricane relief funds](#) from the Federal Emergency Management Agency (FEMA) and redirected that funding toward detention centers along the Mexico border.





While recent reports and lack of action from federal leaders might be disheartening, there is cause for great hope. This past September, more than [7 million people](#) took to the streets to demand climate action. The most inspiring part about this burgeoning climate movement is that it is being led by the global youth. There is also hope in relation to this State of the Beach Report, as it is developed to empower citizens to work with decision-makers and ensure active protection of coastal resources in light of erosion and the effects of a changing climate. The report functions as a tool to motivate elected officials and agencies to implement proactive, long-term solutions that strengthen the resiliency of our coastlines.

The updated 2019 State of the Beach Report assesses the performance of 31 U.S. coastal and Great Lakes states, and the territory of Puerto Rico, against key beach management indicators, grouped into four main categories. These indicators provide a lens to evaluate state policies and efforts to protect our nation's beaches from high risk 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. As in past years, a noticeable trend highlights the fact that states that are the most vulnerable to extreme weather events, such as destructive hurricanes, have inadequate coastal policies and are therefore the least prepared to handle coastal erosion and increasing climate change impacts. The highest-scoring states had strong policies regarding sea level rise planning, building standards, coastal armoring and prohibitions against rebuilding in coastal hazard areas.

The goal of Surfrider's State of the Beach Report is to make the public aware of the ever-growing erosion problem facing our beaches and to 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 [Climate Change website](#).

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 35 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. We proactively address threats, such as coastal development, shoreline armoring, seawalls and beach 'dredge and fill' projects to support the protection of our coasts. At the national level, our environmental science, policy and legal experts work with decision-makers to plan for the future of our coasts.

Surfrider's coastal preservation work includes:

- Safeguarding and passing climate change and coastal preservation legislation at the state and federal levels.
- Halting harmful development and damaging coastal armoring projects around the country.
- Engaging in more than 25 local and state efforts to plan for sea level rise.
- Participating in coastal dune restoration projects across 14 chapters.
- Helping to pass [Community Choice Energy](#) (CCE) programs in communities to allow local municipalities to create their own 'energy portfolio' by increasing renewable energy sources.
- Planting [Ocean Friendly Gardens](#) to create 'living soils' that avoid fossil-fuel intensive fertilizers, trap carbon, prevent stormwater and reduce nutrient runoff.
- Surfing with [Smartfins](#) to collect ocean data that will inform scientists about how climate change is impacting the ocean and marine ecosystems.

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 U.S. Geological Survey [studies](#), 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 the disruption 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 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. It is only after coastal erosion and storm surge threaten properties that 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 (for products such as cement and glass) and infrastructural developments (for asphalt), in addition to fracking and sand replenishment, [the global supply of sand is dwindling](#).



According to U.S. Geological Survey studies, about 50% of surveyed U.S. coastlines are either at 'high' or 'very high' risk of coastal erosion.

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 U.S. 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 continues to be plagued with more frequent and severe hurricanes that are devastating local 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.

Over the past two years, the United Nations Intergovernmental Panel on Climate Change released its [2018](#) and [2019](#) reports,

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 2 degrees Celsius, major impacts are expected to happen due to the amount of greenhouse gases already released into the ocean and atmosphere. However, these impacts will be much more severe if we don't curb our global greenhouse gas emissions significantly and urgently.

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 armoring the coast. However, armoring is just a short-term solution and this approach often leads to overdevelopment of the coast, putting people and homes back in dangerous, high-risk areas. Alternatively, through strategic restoration and planning, shorelines can recover and regenerate to avoid or mitigate erosion. Homes can also be built in a way, and location, that prevents 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, permanently lost for current populations and future generations.

KEY OUTCOMES



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.

Many states have model programs in place to protect our coastal resources. However, this year's report reveals once again that the majority of coastal and Great Lakes states and territories 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 greater steps to ensure our nation's beaches and 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 key 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 criteria checklist is ambitious and the standards are intentionally set at high levels. The report 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.

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



METHODOLOGY

Surfrider’s State of the Beach Report evaluates the performance of states in terms of management of their coastal resources. Erosion responses were analyzed by researching available information from the 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 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.

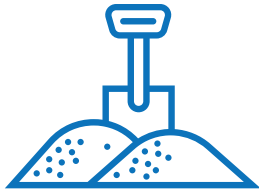
The scoring scale for the four categories is qualitative, based on each state’s ability to meet the key criteria:

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.

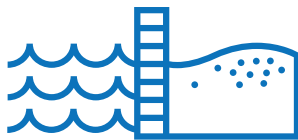
A = 11-12 POINTS	Excellent policies and implementation.
B = 9-10 POINTS	Good policies, but can be improved.
C = 7-8 POINTS	Mediocre policies.
D = 5-6 POINTS	Fairly poor policies, lacking.
F = 4 POINTS	Inadequate protection of coastal communities and resources.

CATEGORIES OF CRITERIA



Sediment Management

Coastal states are encouraged to manage sediment and preserve upland sediment sources to ensure habitat for wildlife and healthy beaches for recreation, tourism and economic opportunities. Adequate sediment management includes protecting and restoring the natural flow of sediment to the coast and along the beach. If necessary, it also includes carefully 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.



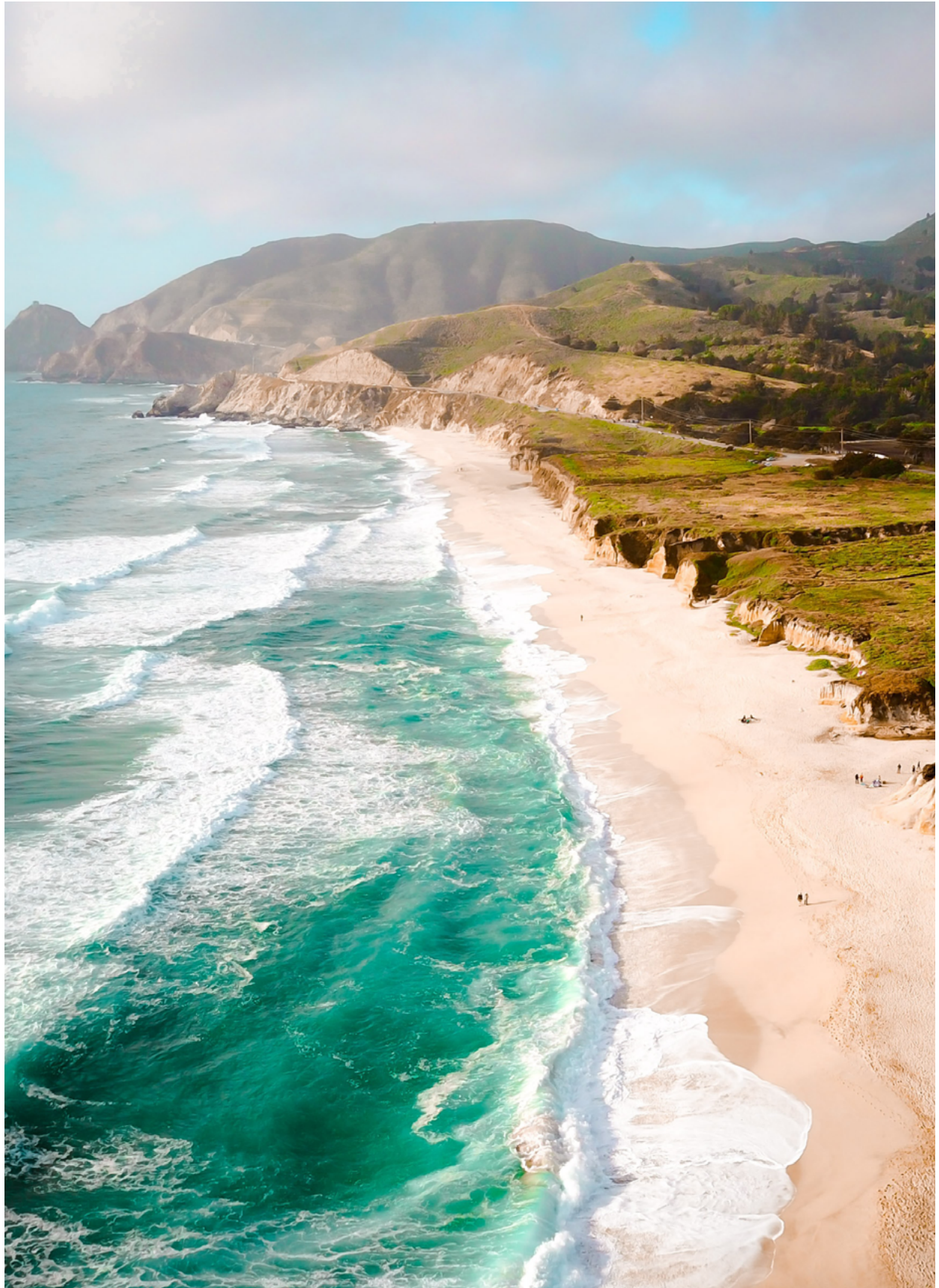
Development

Much of our nation's coastline is 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 ocean, 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 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



California's Coastal Zone includes 1,100 miles of beautiful Pacific coastline from the Oregon border down to Mexico. It has thrived for decades due to the state's trailblazing policies on coastal management. The 1976 California

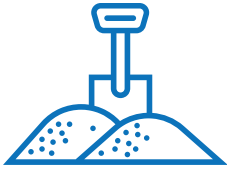
Coastal Act serves as the primary legislation that balances the demands of development with the need for coastal preservation. California is often viewed as a role model for responsible coastal resource management.



BEACH GRADE

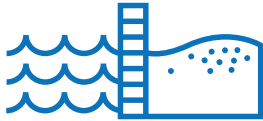
A

Excellent policies
and implementation.



Sediment Management: **Good**

California developed a Sediment Master Plan and a California Sediment Management Workgroup comprised of local and state agencies to establish regional plans. 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 considers progressive measures, such as the reuse of dredged sand, and is analyzing the removal of obsolete dams. Multiple agencies also provide extensive resources and studies related to sediment.



Coastal Armoring: **OK**

The Local Coastal Programs approved by the California Coastal Commission (CCC) often put restrictions on new armoring and the repair of existing seawalls. *Unfortunately, the CCC continues to administer emergency permits for temporary shoreline stabilization structures, and many of these seawalls become permanent.* The CCC seems 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**

When compared to many other coastal states and urban areas, 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 is a leader when it comes to climate change and sea level rise planning. The CCC has taken many steps to help the state proactively plan and has released documents that help municipalities and residents adapt to climate change. For example, the Ocean Protection Council updated and adopted strong sea level rise guidance. The California Resources Agency also updated the *Safeguarding California Plan* and released the 4th California Climate Change Assessment, updating sea level rise projections to reflect new science. Additionally, the California Department of Transportation published a Vulnerability Assessment Report.

Recommendations:

- Prohibit the use of emergency seawalls and hard stabilization devices.
- If hard stabilization is absolutely necessary, only offer emergency permitting with strict time limits for removal, in addition to 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 hard 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 legal advice on managed retreat, protecting public access through rolling easements and rezoning in light of sea level rise.
- Bolster efforts of the California Sediment Management Workgroup to establish concrete regional sediment management plans.

OREGON

WEST COAST



Visitors flock to Oregon's iconic coastline, lined with dramatic rock formations and serene local beaches. All of Oregon's coast remains free and public due to the state's landmark Oregon Beach Bill that was passed in 1967. Outdoor enthusiasts have access to a wide range

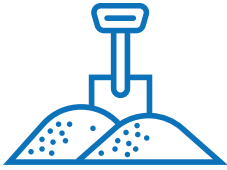
of activities, such as hiking, fishing, surfing, and exploring the state's 362 miles of recreational playground. While the state has excellent sea level rise planning policies, recent policy changes in 2019 have increased the potential for new developments in high hazard areas.



BEACH GRADE

B-

Good policies, but can be improved.



Sediment Management: OK

Oregon has permitting requirements for beach fill projects under the Oregon Parks and Recreation Department but the state is lacking in monitoring processes and plans. Fortunately, unlike some East Coast states, Oregon doesn't rely on beach fill for erosion control. 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 by local management plans.



Coastal Armoring: OK

Under the Ocean Shore Permit Application Review Process, Oregon requires alternative analysis for protective structures that include "an analysis of hazard avoidance alternatives, including relocation of existing buildings or other infrastructure." This is a strong measure that's effective at limiting armoring on the majority of Oregon's shoreline. The state also maintains a geospatial inventory of coastal armoring and over the years, the trend for approving armoring has declined. However, similar to other states, Oregon could improve its 'emergency' permits requirement, in addition to definitions and standards for approved structures.



Development: OK

Oregon does not have a standardized setback system for development and recently removed some important restrictions on new development in high hazard areas. 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, to protect beaches and sand dunes. In 2019, the Department of Land Conservation and Development began convening stakeholders to explore ways to further fine-tune language within 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:

- Ensure language changes to Goal 18 further protect coastal resources by limiting development in hazardous and sensitive areas, requiring 'soft' alternatives to coastal armoring and setting a minimum development setback policy.
- Establish repair and rebuilding restrictions for infrastructure that has been damaged by coastal hazards.
- If hard stabilization is absolutely necessary, only offer emergency permitting with strict time limits for removal. In addition, require 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 analyze environmental and recreational impacts prior to project approval. Also, institute a monitoring program that reviews the 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.

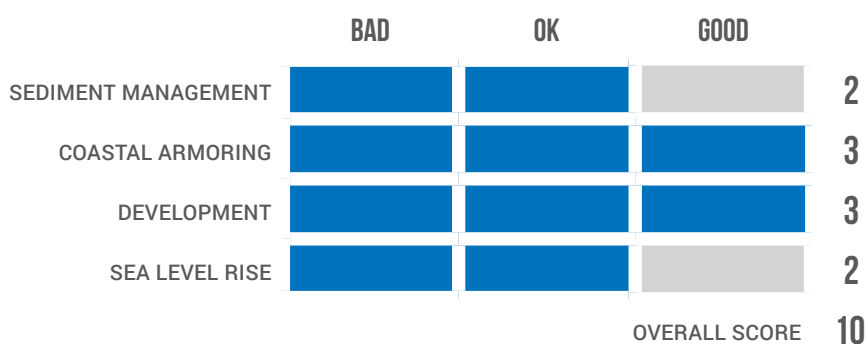
WASHINGTON

WEST COAST



The Washington shoreline, rich with a diversity of geological features and vast bodies of water, is ideal for sightseeing and exploring. The Puget Sound contains up to 786 islands at low tide, many of which can be reached by the state's extensive ferry system. The Strait of Juan de Fuca passes through the

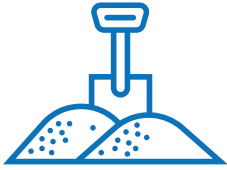
Vancouver Islands to the North and the Olympic Peninsula to the South before entering into the Pacific Ocean. While Washington has strong policies to protect its coastline from armoring and development, the state needs to codify the recommendations for local sea level rise planning efforts.



BEACH GRADE

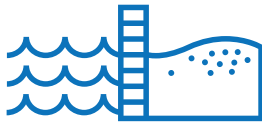
B

Good policies, 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. As an important note however, the state does not heavily rely on beach fill and even 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 develop 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, generated risk maps and 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.

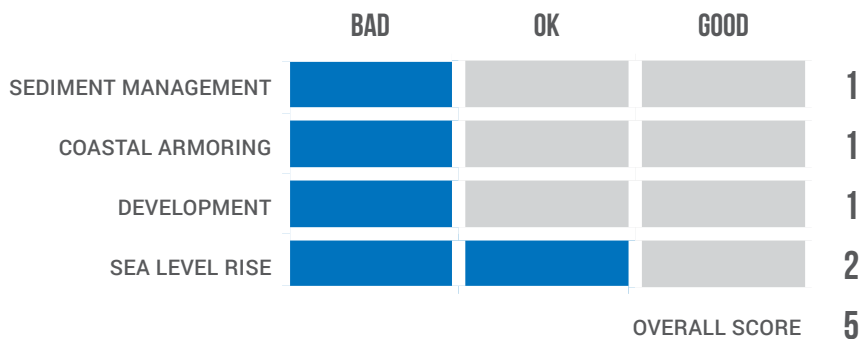
ALASKA

WEST COAST



With 6,640 miles of coastline, Alaska boasts more coastline than all other states in the country combined. The state's largely undeveloped coasts have earned it the nickname "The Last Frontier" and allow for many different habitats to support a multitude of fish and wildlife species. There is pressure to preserve this 'untouched' habitat due to its

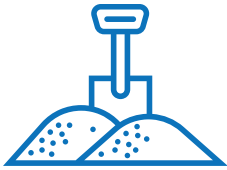
importance to people that rely on its resources. However, commercial operations, such as logging and mining, in addition to climate change impacts, including severe warming and rapid ice loss, increasingly threaten these coastal resources.



BEACH GRADE

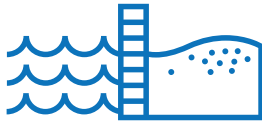
D

Fairly poor policies, lacking.



Sediment Management: Bad

Alaska is lacking sand replenishment and regional sediment management plans. Unfortunately, one of the only policies that deals with sediment management is the Sediment Quality Guideline Options policy, which essentially 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 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 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

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.



SOUTHEAST

FLORIDA

GEORGIA

NORTH CAROLINA

SOUTH CAROLINA

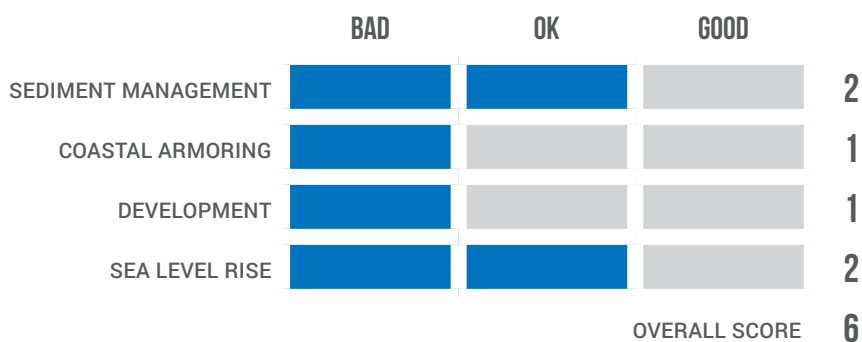
FLORIDA

SOUTHEAST



Florida continues to be at the top of essential vacation spots for visitors across the country. With popular coastal destinations, such as Miami Beach, the Florida Keys, Panama City Beach and the Everglades, the state has a myriad of coastal resources that are in need of protection. As one of the most vulnerable states in terms of erosion and sea level rise, Florida fails to have sufficient coastal policies in

place to mitigate these threats. Fortunately, in 2019, Florida made strides with climate change adaptation when they announced a new grant program that will fund 17 coastal counties to plan for sea level rise. The state also allocated funding to assist with buyouts of at-risk properties and created a [Chief Resiliency Officer](#) that will help communities plan for coastal hazards.



BEACH GRADE

D

Fairly poor policies, lacking.



Sediment Management: **OK**

Florida has a beach management plan, updated in May 2018, that takes into account sediment budgets, inlet management and beach replenishment projects. The Florida Department of Environmental Quality tracks sand movement with a regional offshore sand source inventory. However, the state relies heavily on sand replenishment, often at the expense of more progressive alternatives to erosion response.



Coastal Armoring: **Bad**

While a statewide policy restricts armoring within 50 feet of the mean high water line 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. On a positive note, the state has living shoreline resources listed on the Department of Environmental Protection website with good permit requirements.



Development: **Bad**

Florida has decent regulations to guide development, yet the state allows loopholes for new construction to match the existing 'line of construction' if current structures have not shown any significant signs of erosion. The state also allows any new single-family home to be built seaward of the line of construction. Some municipalities even allow expedited permits to build a seawall for the newly constructed 'vulnerable' property. As such, it is no surprise that a [2019 Zillow and Climate Central report](#) found that Florida has allowed the construction of over 9,000 homes in flood risk areas since 2010.



Sea Level Rise: **OK**

Florida is the poster child for sea level rise and is currently experiencing the impacts of climate change, such as 'sunny day flooding' and extreme King Tides. Most of the work being done to plan for climate change is happening at the local level. For example, the Southeast Florida Regional Climate Change Compact is doing tremendous work. In addition, a new program in Tampa Bay will train realtors on flood mapping, building code and flood insurance to help inform residents. The state has also taken some important steps to increase coastal resilience in 2019, as it allocated \$75 million of federal funds to buy out flood-damaged homes, and developed a grant program to help 17 coastal counties plan for sea level rise.

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 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



Although limited, Georgia's Atlantic shores have a fair share of beauty and history. While Georgia celebrated the 20-year anniversary of its coastal management program in 2018, the program still lacks the foundational policies needed to plan for the inevitable coastal hazards facing its coastline.

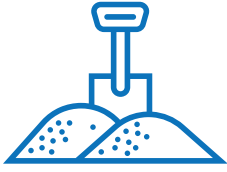
Fortunately, amendments to the Shore Protection Act were signed into law recently that will improve the state's setback policies for coastal development, which is an important step in the right direction.



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 plan. Although the plan provides guidelines for careful beach nourishment practices, these are only recommendations. While there is a five-year monitoring program after each nourishment, the focus is more on efficacy and not ecological impacts. While sand replenishment projects must have a Shore Protection Act permit, the requirements for approval are rather lenient.



Coastal Armoring: Bad

Groins and jetties are included as a 'first alternative' method, along with dune restoration and nourishment. While there are some policies for limiting hard structures, smaller stabilization projects are allowed without a permit. During state-declared emergencies, the 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

The Shore Protection Act offers some protection for coastal habitats and infrastructure. Amendments to the Act were signed into law in May 2019, strengthening Georgia's setbacks for coastal development. The original boundary, determined by trees along the coast that are 20 feet high, will now be determined by a set distance of 25 feet landward from the high water mark for private property and 100 feet landward for state property. Yet the state would benefit from stronger development standards.



Sea Level Rise: Bad

Georgia's Hazard Mitigation Plan dismisses sea level rise as 'not an immediate natural hazard,' despite the fact that nearly 40% of its coast is currently exposed to increased coastal hazards. The state does not have a climate change adaptation plan or vulnerability assessment. Only Tybee Island has developed an adaptation plan, which focuses on retrofitting, establishing repetitive loss policies, and elevating structures. However, these recommendations do not have an implementation plan.

Recommendations:

- Only allow armoring if all other methods have been attempted, including managed retreat, dune restoration and wetland protection.
- 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.

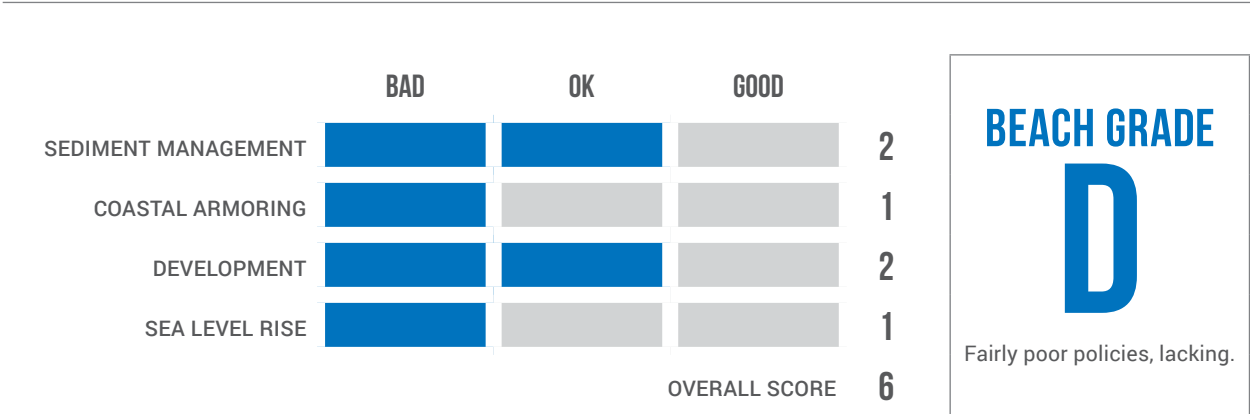
NORTH CAROLINA

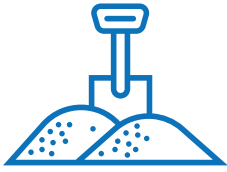
SOUTHEAST



North Carolina’s coastal region attracts more than 11 million tourists every year. With quaint coastal towns and beautiful barrier islands in the Outer Banks, the state is an East Coast staple destination. In order to protect North Carolina’s coastal resources, the state must strengthen its coastal

management policies, especially in the areas of climate change planning and development. A [2019 Zillow and Climate Central report](#) show that many coastal properties are still being built in harm’s way.





Sediment Management: **OK**

North Carolina's comprehensive Beach and Inlet Management Plan, updated in 2016, addresses erosion and sediment issues, tailors management programs to specific regions and incentivizes the need for preservation through a socioeconomic evaluation of its beaches. While the volume of sand placed on beaches has doubled in recent years, the state has important permit requirements, 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**

North Carolina's exemptions for temporary sandbag seawalls and terminal groins completely undercut the strong policy of prohibiting coastal armoring. 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. Several studies have been completed regarding living shorelines, but not much has been done by the state to implement these findings.



Development: **OK**

Statewide setback standards for coastal hazard areas are 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. This weakened dune protections and increased flood risk for the town, which experienced severe damage during the 2018 hurricane season. According to a [2019 Zillow and Climate Central report](#), the state is still building hundreds of homes in flood risk zones. In addition, recent county-level laws were allowed to reduce environmental siting requirements for the more intensive industrial developments.



Sea Level Rise: **Bad**

North Carolina has been slow to plan for sea level rise. A previous ruling by the state governor outlawed the use of sea level rise projections in coastal planning until 2016, which severely delayed and hindered the state's ability to plan for sea level rise and intensified storms. Additionally, instead of strengthening flood resistance, the state approved a bill in 2017 that weakened protections for habitat areas that help to provide natural flood control, including riparian buffers. However, in October 2018, Executive Order 80 was signed which initiated the development of the North Carolina Climate Risk Assessment and Resiliency Plan. The preliminary information available about the plan does not reference sea level rise specifically, but it is a step in the right direction. The timeline calls for the final document to be submitted to the governor by March 2020.

Recommendations:

- 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.

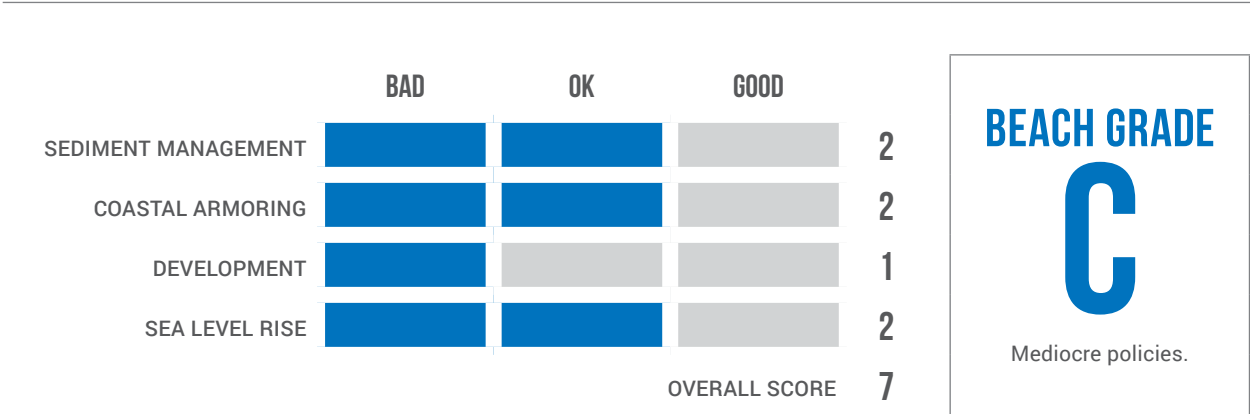
SOUTH CAROLINA

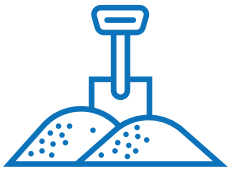
SOUTHEAST



South Carolina’s 197 miles of coastline serve as an important economic and environmental resource to the state. Efforts have been made to collaborate with local communities on beachfront management as relevant counties and municipalities are required to develop management plans

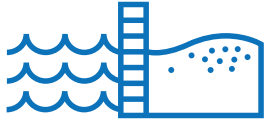
that the state must review and approve. However, stronger policies on development, from increased regulations on materials used in artificial reefs to more rigorous policies on building construction and repair in hazard areas, are needed.





Sediment Management: OK

South Carolina requires that all coastal governments complete beach management plans. These plans include monitoring requirements and extensive analysis of nourishment projects. Beach replenishment is promoted but must be 'carefully planned' and adhere to the standards established in each management plan. The state considers physical as well as ecological implications of beach nourishment, such as spawning seasons and migratory movements of important marine species.



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. The governor also vetoed a bill in May that denied the replacement of a bulkhead which would have only protected 17 homes. Unfortunately, groins are still allowed as long as they have a sediment management plan. However, strengthening, rebuilding or increasing previously built seawalls are prohibited. Severely damaged seawalls must be removed at the owner's expense.



Development: Bad

The development setback standard is 40 times the average annual erosion rate and no less than 20 feet from the top of the main sand dune at ocean coastlines. The revision of setback lines must occur every 7 to 10 years. 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 also located seaward of setback lines, is allowed. 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 state has a sea level rise vulnerability assessment, although the assessment is fairly broad. The *2010 Climate Change Impacts to Natural Resources in South Carolina* report has good methods to adapt along a changing shoreline. The county of Beaufort also has an adaptation report of their own. However, none of these adaptation recommendations have been implemented or codified. In addition, 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.
- Remove coastal armoring exceptions currently in place.
- Conduct a thorough sea level rise vulnerability assessment.
- Develop and implement an adaptation plan using outlined policies and management recommendations in the 2010 Adapting to Shoreline Change report.
- Establish stronger restrictions on developments in coastal hazard areas and locations seaward of the baseline.
- Require that repairs of coastal structures from storms are restricted, retreated or built to higher standards.
- Develop website with educational resources and guidelines for coastal communities to prepare for climate change and sea level rise.
- Remove exemptions for golf courses to build in coastal hazard areas.
- Ensure that management agencies have jurisdiction to adequately enforce regulations.



MID-ATLANTIC

DELAWARE

MARYLAND

NEW JERSEY

NEW YORK

VIRGINIA

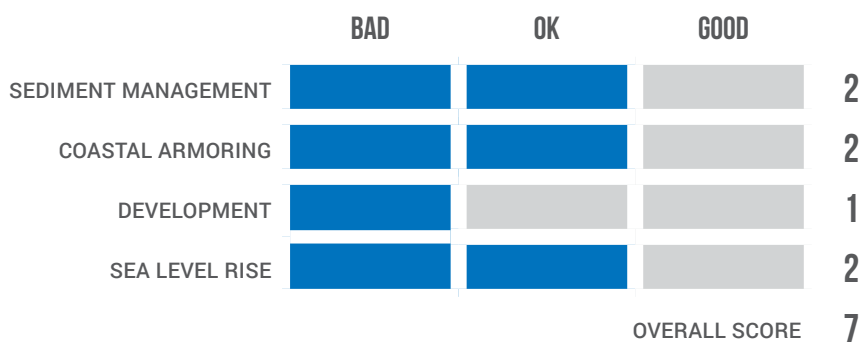
DELAWARE

MID-ATLANTIC



Delaware's shoreline provides a myriad of recreational opportunities for tourists and locals alike, from kayaking the bays and estuaries to relaxing on one of the state's popular beaches. The Delaware Sea Grant program has taken great strides to help communities prepare and mitigate various

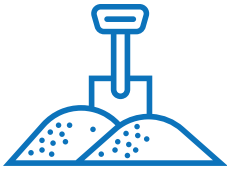
natural threats to coastal habitat and infrastructure. However, the state still has outdated policies regarding setback distances, which can be counterproductive when trying to protect coastal resources and keep residents out of hazard areas.



BEACH GRADE

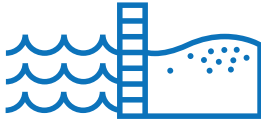
C

Mediocre policies.



Sediment Management: OK

While the state does not have a statewide sediment management plan, there are some such plans, such as a plan for Delaware Bay Beaches that are well-thought-out. 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 and the ecological implications that surround it.



Coastal Armoring: OK

Permits are required for armoring projects and the state encourages alternative stabilization methods, including retreat. In addition, illegal seawalls must be removed and fines are administered. Delaware has vague policies on repairing seawalls and allows for emergency permitting in severe conditions. While policies mention that agency staff can require removal of emergency permitting at a later date, this practice is not mandated for all. Fortunately, Delaware prioritizes living shorelines.



Development: Bad

While the state has a development setback line, the 1979 policy needs updating. Delaware has minimal restrictions on coastal development. Homes can also be constructed near 'building lines.' While construction seaward of the building line is prohibited, property owners are able to get a permit, as long as development is as landward as possible. Delaware also allows rebuilding of seaward structures with a permit. A [report](#) found Delaware is constructing new developments in flood risk zones 2.5 times faster than in safer areas.



Sea Level Rise: OK

Despite having lackluster development standards, Delaware has made good strides to address sea level rise. The state produced a sea level rise vulnerability assessment, which identifies at-risk properties. In addition, the state developed the document to help communities to prepare for sea level rise. The state has also been active with adaptation. Under an Executive Order, agencies developed 155 recommendations for climate adaptation. Unfortunately, development is still occurring in flood prone coastal areas that will be impacted by rising seas.

Recommendations:

- Develop a statewide beach management plan to clarify requirements for beach replenishment permit applications, in addition to the monitoring of ecological impacts from projects.
- Clearly state armoring permit requirements.
- Establish time limits on seawalls.
- Prohibit any weakening of development setback requirements.
- Develop a more thorough and enforceable policy that promotes non-structural alternatives for shoreline stabilization.
- 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 coastline has everything from lively boardwalks along white sand beaches to wild horses on Assateague Island. Although the state has many pressures on its coastal resources, including climate change and increasing coastal

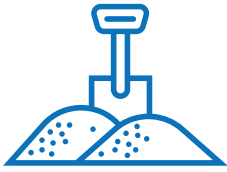
growth and development, the state's Chesapeake and Coastal Service has been fairly successful in helping the state to navigate these increasing demands and improve its coastal management policies.



BEACH GRADE

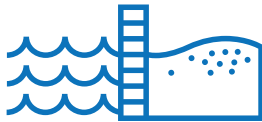
B

Good policies, 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. A permit must be obtained from the Department of the Environment for any fill and dredge activities in wetlands.



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 in the state's Living Shorelines Protection Act. In fact, Maryland DNR awarded over \$30 million to local entities for projects that included living shorelines. 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. Property owners are also allowed to repair bulkheads without a permit.



Development: OK

Maryland has a statewide minimum setback of 100 feet from tidal waters and wetlands, and a minimum setback of 200 feet in undeveloped coastal areas. There is a thorough permitting process to construct near the shore, including strict policies that restrict the repair of residential and commercial structures in the 100-year flood zone. There are also seemingly strong policies to maintain the natural coastal environment, including the protection of wildlife corridors and the clustering of development. However, new developments can unfortunately be permitted in Resource Conservation Areas.



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. Maryland also has enforceable policies that require buffers around critical areas in parts of the Chesapeake Bay.

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.

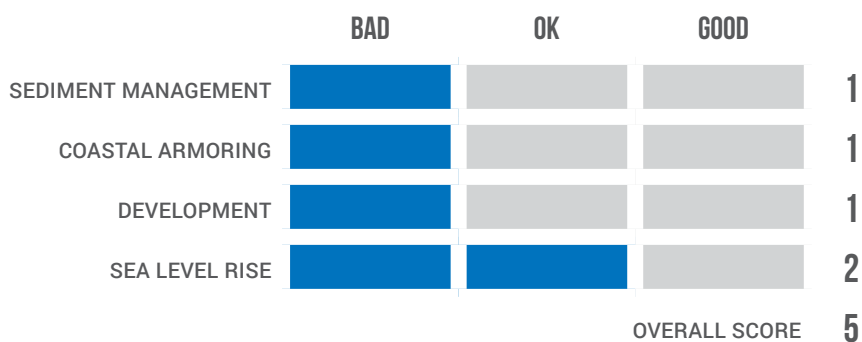
NEW JERSEY

MID-ATLANTIC



The Garden State is known for its plethora of coastal attractions. However, as popular as the state's beaches are, New Jersey must develop more effective management strategies to deal with coastal hazards and climate change impacts. The state is taking a step in the right direction with their Blue Acres program to promote managed retreat, and

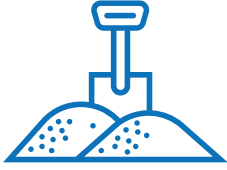
the recent development of a Coastal Community Vulnerability Assessment Protocol to help communities deal with storm surge and sea level rise. However, a [2019 Zillow and Climate Central report](#) uncovered that New Jersey is developing nearly three times faster in flood zones in comparison to safer areas.



BEACH GRADE

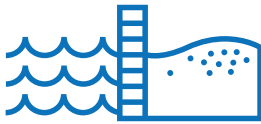
D-

Fairly poor policies, lacking.



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. New Jersey has some policies that dictate beach fill, such as matching grain size and ensuring that sand comes from clean sources. However, for the most part, the state regulates fill as a 'non-structural shoreline protection measure' without strict permit requirements and monitoring plans. Like many states, the Army Corps of Engineers plays a significant role in funding and permitting nourishment projects for New Jersey.



Coastal Armoring: **Bad**

Seawalls and other hard structures are considered 'essential' to protect the shoreline and urbanization. In addition, restrictions on repairing or replacing armoring should be strengthened. The state is also lenient with emergency permits and requires very few restrictions. For example, a permit request can even be done over the phone. While living shoreline projects could be used instead of armoring, the state has not offered local communities resources or funding.



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 nearly 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 on coastal bluffs where only a 10 foot setback is required from the crest of the bluff. To improve, the state should consider developing setback requirements based on local erosion rates.



Sea Level Rise: **OK**

Recently, New Jersey has made progress on climate change planning. The state 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. New Jersey's *Blue Acres Buyout Program* is a positive example of a program that will help with sea level rise planning. The state plans to use \$300 million to purchase homes in coastal hazard areas.

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.

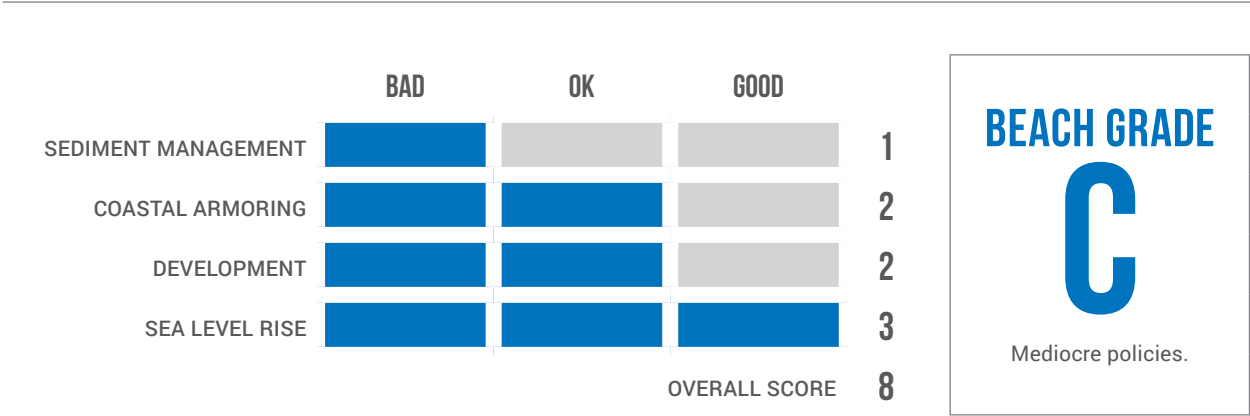
NEW YORK

MID-ATLANTIC



The state of New York has a unique combination of shorelines that border Lake Ontario and the Atlantic Ocean. Tourists and New York natives often frequent the state’s eastern beaches, such as Long Island, Coney Island and the Hamptons. However, the policies to regulate these

coastal resources are lacking, specifically in the areas of coastal armoring. The state continues to build massive seawalls and encourages the use of floodgates in lieu of considering options to move people back from the shore.





Sediment Management: **Bad**

New York does not have a statewide sediment management plan. Instead, it relies heavily on replenishment as the go-to shoreline stabilization method, despite the practice being costly and short-term. While the state has a beach replenishment policy, it lacks necessary rigor to sufficiently protect the coastal habitat. Fortunately, material placed on beaches must come from a clean source and be of equivalent grain size. While the state is working with the Army Corps to establish erosion management policies and regional plans, there has been little progress.



Coastal Armoring: **OK**

While the state has policies on limiting shoreline stabilization structures in sensitive areas and promoting soft or natural approaches to shoreline stabilization, there are no policy restrictions on rebuilding coastal armoring. 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. In addition, a 5-mile long seawall is planned to be built around Staten Island. While a dune component is included, the massive seawall could have been scaled back. Additionally, 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. The state prohibits the excavation or mining of dunes, in addition to vehicle traffic and certain types of foot traffic. 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. There is also a Coastal New York Future Floodplain Mapper that is available to the public. In addition, the state encourages adaptation planning and aims to protect habitats that will allow for potential sea level rise. 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.

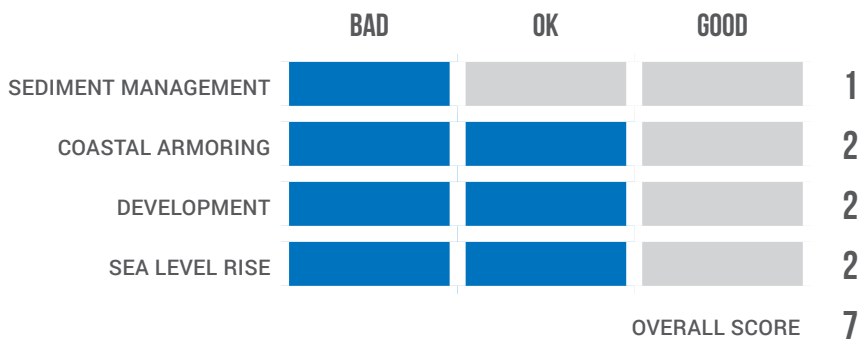
VIRGINIA

MID-ATLANTIC



Over 5 million Virginia citizens call the state's coastal zone home. In order to manage these coastal areas, the state uses what they like to call a 'networked program' that depends on state and local agencies to enforce the laws and regulations

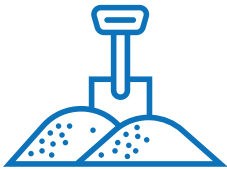
set forth in the program. There are relatively good policies in place to protect Virginia's coastline, with some notable exceptions in terms of certain climate change impacts and shoreline stabilization that should be addressed.



BEACH GRADE

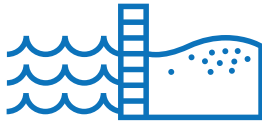
C

Mediocre policies.



Sediment Management: Bad

The state conducts sand replenishment projects, without any regional sediment management or beach nourishment plans. In fact, Virginia includes nourishment funding in the annual budget. Permit requirements for replenishment projects are unclear and differ by city. The state would benefit from the review of 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. 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. In 2015, a legislative decision allowed for loans to be distributed to local municipalities for the purpose of establishing living shorelines.



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. However, state policy allows development in wetlands that are considered to be of 'lesser' ecological significance. 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 Hazard Mitigation Plan to 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, wetlands and wildlife corridors.



NORTHEAST

CONNECTICUT

MAINE

MASSACHUSETTS

NEW HAMPSHIRE

RHODE ISLAND

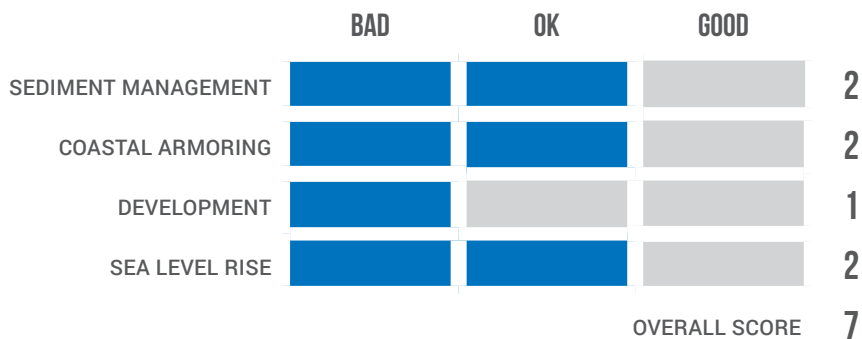
CONNECTICUT

NORTHEAST



Connecticut's picturesque coastline is where people go to enjoy less-crowded beaches than those on the Atlantic coast. In order to promote the longevity of this serene shoreline, it is important that the state increases its involvement at the local level and continues to improve its climate change legislation, such as the bills adopted

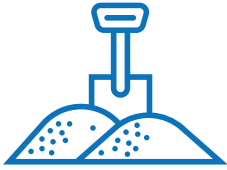
regarding climate change resiliency and renewable energy. Additionally, the state's coastal development policies require significantly more rigor, as a 2019 [report](#) uncovered that Connecticut is building in flood risk zones three times faster than in safer areas.



BEACH GRADE

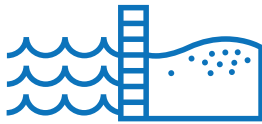
C

Mediocre policies.



Sediment Management: **OK**

Connecticut has almost no codified regulations to analyze impacts to coastal resources during replenishment projects. As long as the material is considered to be clean and 'beach compatible' by the U.S. Army Corps of Engineers, nourishment is encouraged. 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 a marine spatial plan for Long Island Sound that identifies dredged material disposal sites as Significant Human Use Areas.



Coastal Armoring: **OK**

There are strong policies preventing hard stabilization methods, which require all proposed projects to obtain a permit from the Department of Energy and Environmental Protection before any work is done. 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: **Bad**

In July of 2019, *Zillow and Climate Central* reported that Connecticut is developing in 'risk zones' three times faster than in safer locations. Although statewide setback minimums are not established, local jurisdictions can develop their own setback guidelines, in addition to restrictions on repair and rebuilding in hazard areas. However, some towns continue to allow development near coastal hazard areas. Fortunately, properties in clearly delineated 'coastal zones' require additional permitting and review.



Sea Level Rise: **OK**

Governor Lamont signed an executive order in September 2019, which calls for a revised statewide Adaptation and Resilience Plan for Connecticut. While this is a positive step in the right direction, current sea level rise resources on the website are fairly out of date, and there is still not a thorough sea level rise vulnerability assessment for the state. However, a newly developed sea level rise model assesses vulnerability for coastal roads and wetlands statewide.

Recommendations:

- Require the 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.
- Restrict development in flood prone areas.
- 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's coast stands out from conventional white sandy beaches with its magnificent rugged, rocky and secluded shoreline. The state has also been fairly stringent when it comes to managing it. Unfortunately, private property

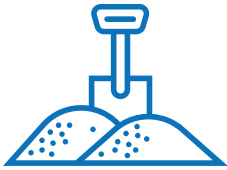
owners generally have jurisdiction over the shore up until the low water mark. Public rights in these areas are only granted for fishing, fowling, and navigation purposes.



BEACH GRADE

B

Good policies, but can be improved.



Sediment Management: OK

Maine needs to establish sediment management plans. Fortunately, the state has been implementing a shoreline change monitoring program for the larger beach systems. Through a mapping program, Maine collects annual shoreline positions and calculates dune, beach and dry beach width changes each year. This data is used to help understand sand migration along Maine's beaches, in addition to the vicinity of dredging and beach fill projects.



Coastal Armoring: OK

A staggering amount, roughly 70 miles of beaches in Maine, have been armored. Although previous policies failed to protect beaches from hard structures, Maine now has a stronger armoring policy. New seawalls on any beach are prohibited and the repair of 'grandfathered' seawalls require a permit if more than 50% of the structure is being altered. Maine prioritizes the use of living shorelines. Emergency permitting of riprap or sandbags must be removed within five days of installation.



Development: OK

Maine has statewide setback regulations and allows local municipalities to establish additional land use controls. The state has policies for managed retreat when structures are modified 'more than 50% of their value.' Unfortunately, a policy enacted in 2013 allows residential buildings to be moved forward into sand dunes. In the event that development occurs in sand dune areas, the entity applying for a permit must demonstrate that the disturbance to the resource is minimized to the greatest extent.



Sea Level Rise: Good

The state is doing a good job of planning for sea level rise and is also educating local communities about risk and preparedness. The state developed and released a self-assessment tool for communities to use for sea level rise and flood hazard planning. Although there is not a thorough statewide sea level rise vulnerability assessment or adaptation plan, regions are encouraged to develop their own plans. Maine's new Climate Council held its first meeting in October 2019, and will be working over the next year to develop statewide standards on sea level rise 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.

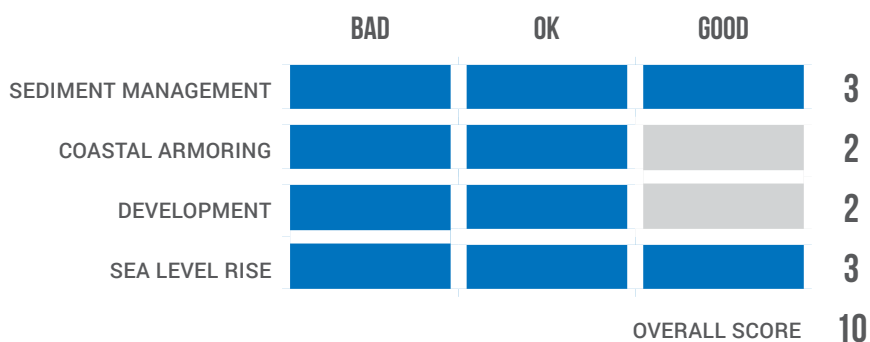
MASSACHUSETTS

NORTHEAST



Massachusetts is proud of its dynamic 2,819 miles of tidal coastline, which include ecosystems such as salt marshes, tidal flats, barrier islands and estuaries. This is evident from the state's thorough sediment management regulations

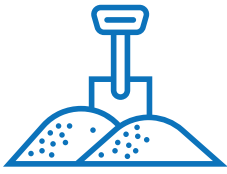
and climate change policies. With some improvements to Massachusetts policies regarding coastal development setbacks, the state can be well on its way to having a great overall coastal management plan.



BEACH GRADE

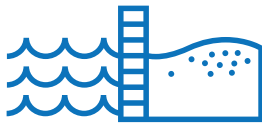
B

Good policies, but can be improved.



Sediment Management: Good

Massachusetts has developed best management practices for beach fill projects, which 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

Armoring is only allowed on coastal banks if developed prior to 1978 and if an alternative isn't feasible. Wetland protection regulations detail requirements that must be met when constructing groins. The state also keeps an impressive inventory of nearly all shoreline stabilization structures. The state also allocates funds for a Dam and Seawall Repair or Removal program to address failing structures. The state would benefit from more measures to help guide emergency permits.



Development: OK

While there is no statewide development setback standard, Massachusetts has taken a strong stance on avoiding the permitting of construction in high hazard areas. In addition, proposed developments in coastal resource regions are reviewed by local and state agencies. While policies against new developments in hazard areas are strong, there are not strong policies to restrict the repair of frequently damaged properties in hazard areas. The state does have policies to protect barrier beaches and dunes.



Sea Level Rise: Good

Massachusetts continues to be a leader in planning for climate change. The state has produced numerous 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 resources for local communities to assess vulnerability and increase resilience. The state also provides climate change planning grants to local communities. An Executive Order was passed to address climate change planning.

Recommendations:

- Clearly delineate high-hazard areas and prohibit new developments in established areas.
- Create policies for managed retreat, relocation, buyouts and retrofitting; include limits on the amount of repairs permitted.
- Codify relocation and managed retreat as enforceable policies.
- Prohibit coastal armoring or limit by including conditions, such as sunset clauses.
- Establish statewide minimum setback standards to provide a safe buffer between coastal hazard areas and coastal developments.
- 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.

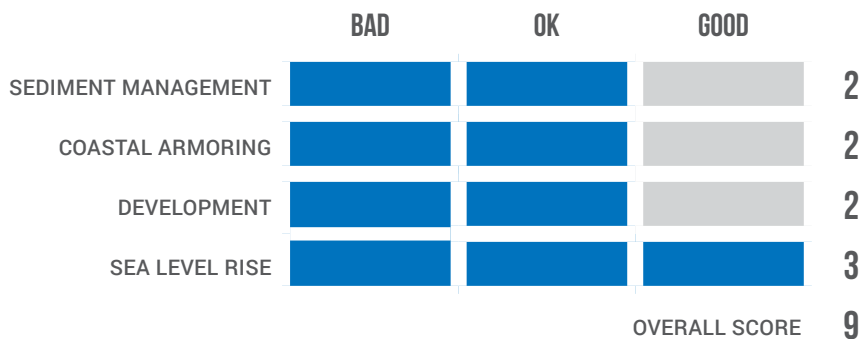
NEW HAMPSHIRE

NORTHEAST



New Hampshire has the shortest ocean coast compared to any other coastal state, with 18 miles of coastline. However, the quintessential mellow, east coast atmosphere draws locals and visitors alike. While the state has put noticeable

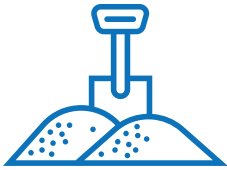
effort into engaging and educating communities on its shoreline's vulnerability to climate change, it may need to reevaluate some policies regarding development repairs allowed in hazard areas.



BEACH GRADE

B

Good policies, 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. The Department of Environmental Services (DES) Wetlands Bureau has regulatory authority over replenishment projects and requires permits for dredge and fill in wetlands. Unfortunately, there is no explicit requirement for monitoring ecological impacts.



Coastal Armoring: OK

Living shorelines are promoted over armoring and the state has 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. Policies also require that the department avoids approving any changes to existing structures unless the changes are proven to have a smaller environmental impact. While emergency permitting for coastal armoring is available, 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' in coastal hazard areas, instead of requiring that structures are moved or built to a higher standard. Fortunately, New Hampshire policies provide coastal hazard benefits by including rules that offer protection for wetlands and dunes.



Sea Level Rise: Good

New Hampshire has some great resources available for residents to learn about climate change. A recent report geared toward preparing the state for future sea level rise includes maps that show estimated inundation along the coastline. 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.

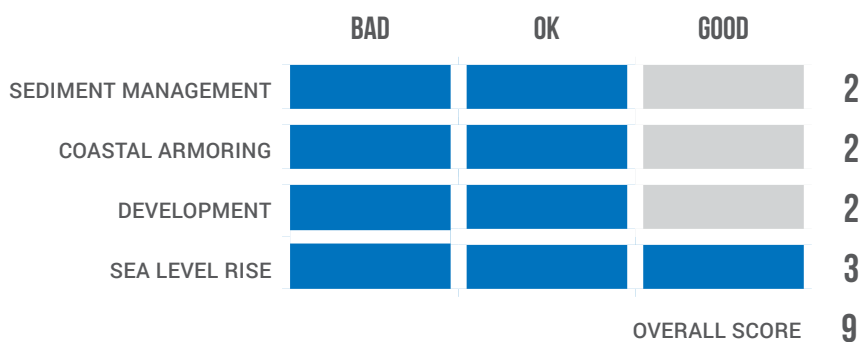
RHODE ISLAND

NORTHEAST



As the country's smallest state, Rhode Island packs in 40 miles of scenic coastline and is dubbed "the Ocean State." Rhode Island has created a well-designed management plan that outlines best practices for local and state entities to

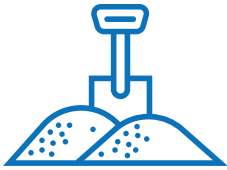
navigate and recover from coastal hazards. However, Rhode Island's grade went down slightly this year as a recent [report](#) highlighted that the state is increasing construction in flood risk zones.



BEACH GRADE

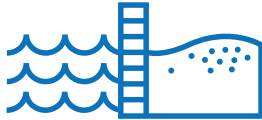
B

Good policies, but can be improved.



Sediment Management: OK

Beach replenishment projects are allowed and encouraged. The state's coastal management program requires nourishment projects to have a permit and public notice after review of several agencies. Impacts to sedimentation and public access 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 to discourage coastal armoring and also requires the analysis of non-structural erosion methods, including relocation. 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: OK

Coastal land in Rhode Island is well-protected with established coastal buffer zones and significant statewide mandatory setbacks. 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. A new permit is required if more than 50% of the structure is damaged. However, new construction in coastal hazard areas is not prohibited, and a [2019 report](#) found Rhode Island is building in risk zones two times faster than in safer locations.



Sea Level Rise: Good

While Rhode Island does not have a statewide sea level rise plan, the state continues to progress with climate change planning. 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. Additionally, the state's planning division completed a report that analyzed the socioeconomics of sea level rise, which can help communities plan.

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.



GULF STATES

ALABAMA

LOUISIANA

MISSISSIPPI

TEXAS

ALABAMA

GULF STATES



Alabama's sugar-white, sandy beaches, which come from quartz grains that washed out of the Appalachian Mountains, are a defining characteristic of the state's shorelines that run along the Gulf of Mexico. The state's beaches also serve as important economic and environmental assets. Alabama

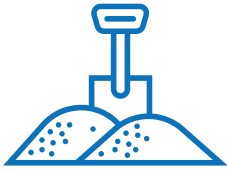
needs to improve current coastal management policies to regulate activities, such as dredging to create ship channels and the excessive building of seawalls, in order to preserve these vital coastal resources.



BEACH GRADE

F

Inadequate protection of coastal communities and resources.



Sediment Management: Bad

With rapid erosion and wetland loss, exacerbated by years of 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 state's *Coastal Area Management Plan* does not provide clear guidelines on replenishment practices or ecological monitoring and review.



Coastal Armoring: Bad

In Alabama, property owners must first consider managed retreat and other soft stabilization methods to protect properties on Gulf beaches and primary dunes. However, if alternate options are deemed 'infeasible,' property owners 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. While Alabama has also identified a goal to eliminate development in high hazard areas, progress or implementation of this goal is not evident.



Sea Level Rise: Bad

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 changes. It also takes into account different rise rates, land change and king tides. Unfortunately, the state does not have a statewide adaptation plan, nor is the state actively encouraging local municipalities to plan for future sea level rise.

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 that is 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.

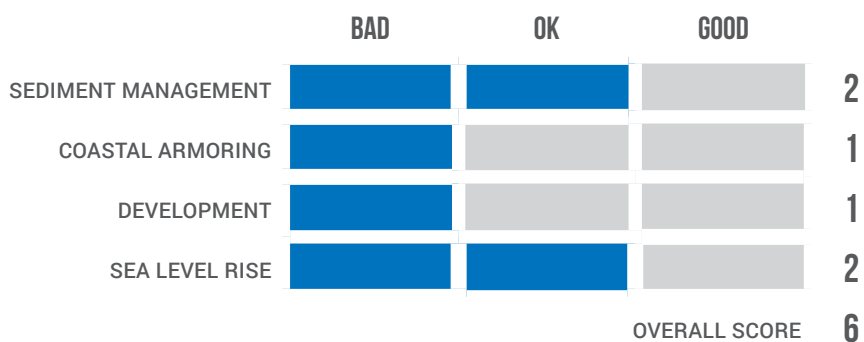
LOUISIANA

GULF STATES



Louisiana is known for its extensive inlets, bayous and coastal wetlands that support important recreational and agricultural interests as well as the state's \$1 billion dollar seafood industry. However, the state's coastline is highly

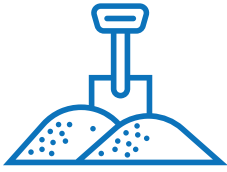
vulnerable to severe storms, flooding, coastal development and disappearing wetlands. It will become even more imperative for the state to fortify its coastal management plans to preserve the natural coastline for the future.



BEACH GRADE

D

Fairly poor policies, lacking.



Sediment Management: **OK**

Louisiana is in a vulnerable position due to its location in relation to the Mississippi River, so it is imperative to have a thorough sediment management plan in place. While the state is part of the *Gulf of Mexico Alliance Regional Sediment Management Master Plan*, no recent strides have been made to finalize this initiative. While permits are required, there is minimal review of ecological impacts or long-term monitoring. 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. For example, Louisiana's coastal construction rules do not require permits for the repair of existing structures as long as dredging and filling are not involved. 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.



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. Unfortunately, Louisiana has a guidance document for coastal development that helps communities to 'build safely' near the edge of water bodies. Louisiana has a *Planning Appendix* with great recommendations to increase the resiliency of the coastline, yet many of the recommendations are not yet implemented.



Sea Level Rise: **OK**

Louisiana made a significant improvement on sea level rise planning by releasing a *Regional Adaptation Plan* in April 2019. The document includes a flood risk series and detailed recommendations to prepare for coastal hazards, including the suggestion of optional buyout programs. The state is also making substantial efforts to encourage local jurisdictions to build beyond National Flood Insurance Program requirements with the recently released *Community Rating System*. The state could still benefit from improving its rules to protect vital riparian areas.

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.

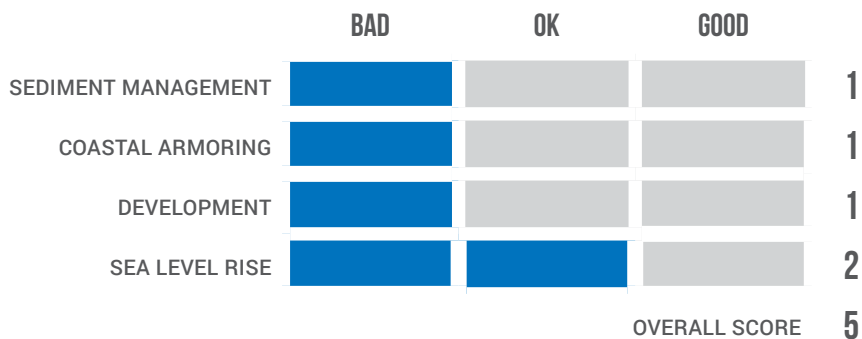
MISSISSIPPI

GULF STATES



The Mississippi Gulf Coast is a staple coastal destination in the South. Visitors and locals alike make their way to the beach to boat, fish, swim or just relax. With a low-lying coastline, it is important for Mississippi to revisit its coastal

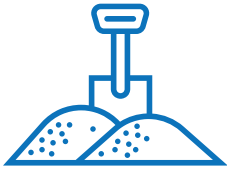
management strategies to ensure that regulations set in place are sufficient enough to protect its important coastal resources.



BEACH GRADE

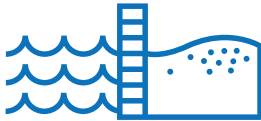
D

Fairly poor policies, 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 and encourage 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 are 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. This project is also funding large-scale wetland and reef restoration projects, 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. A [2019 report by Zillow and Climate Central](#) uncovered that Mississippi is building in high flood risk zones three times faster than in safer locations. In addition, the construction of a building, fishing camp, or 'similar structure' is allowed in coastal wetlands on private property, even without a permit. Fortunately, there have been increased efforts 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 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 the required consideration of sea level rise and climate change in local hazard mitigation plans. It would also benefit from stronger attempts to disseminate information to local communities and jurisdictions.

Recommendations:

- Establish a statewide development setback minimum requirement.
- 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.

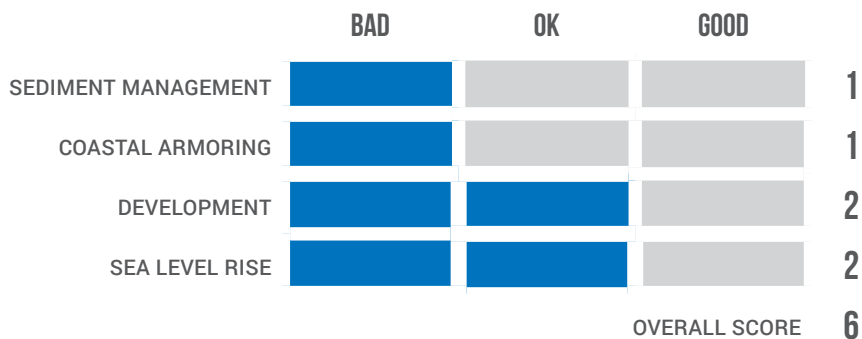
TEXAS

GULF STATES



Texas was hit hard with damage in 2017 when Hurricane Harvey blew through the Gulf of Mexico. The state's 300+ miles of warm water beaches and surrounding development were crippled with major flooding. This disaster proved to be a wake-up call for Texas as the state's Land Commissioner

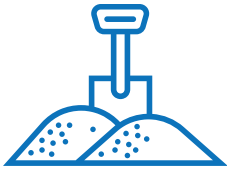
recently released the *2019 Texas Coastal Resiliency Plan* to work toward a more resilient coast. However, it would be useful for Texas to be more proactive than reactive with its regulations to better prepare for the future.



BEACH GRADE

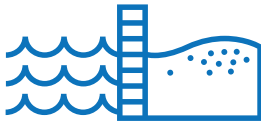
D

Fairly poor policies, lacking.



Sediment Management: **Bad**

Beach replenishment is frequently used in Texas, especially for 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**

While Texas tries to prioritize soft stabilization methods, such as dune and wetland restoration, the state often 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: **OK**

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. Beachfront construction also 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 Master Plan*, which contains climate change adaptation measures, was released in March 2017 and it was updated in 2019. While the updated version includes a greater emphasis on living shorelines, the plan still 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:

- Use stronger sea level rise projects in the adaptation plan.
- Conduct a thorough sea level rise vulnerability assessment.
- 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 and seawalls.
- 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.



GREAT LAKES

ILLINOIS

INDIANA

MICHIGAN

MINNESOTA

OHIO

PENNSYLVANIA

WISCONSIN

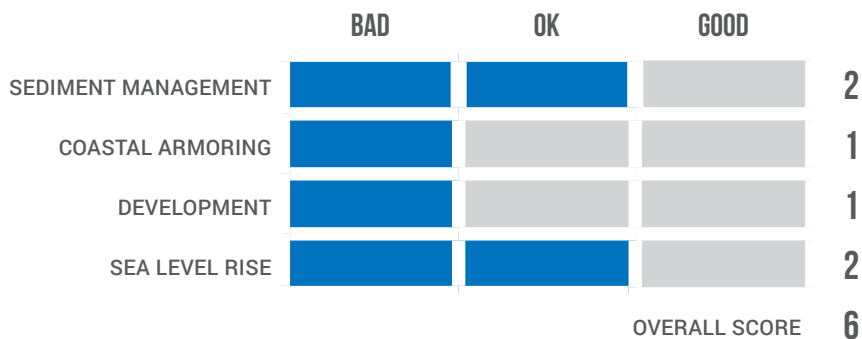
ILLINOIS

GREAT LAKES



The Lake Michigan shoreline and the city of Chicago hold significant economic and social importance for Illinois, as visitors and locals often enjoy the state's white sand beaches. In fact, these are the most densely populated coastal areas in the entire Great Lakes region. As a result,

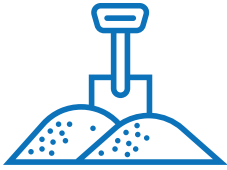
there is often beach modification and human development that occurs along the coast, which creates hardened sand from frequent beach renourishment. Well-designed policies are crucial to find a balance between increasing development and promoting a healthy coastal environment.



BEACH GRADE

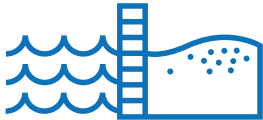
D

Fairly poor policies, lacking.



Sediment Management: **OK**

The state conducts and encourages beach fill on their lakefront areas. 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. Permits for beach fill are also streamlined. Although Illinois does not have a regional sediment management plan, the state is 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 coastline has been developed. There are no statewide mandated setback requirements or construction restrictions on the shoreline. While the coastline 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 coastal resources.



Sea Level Rise: **OK**

Illinois has been relatively slow in addressing climate change. However, the Department of Transportation made progress 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. However, it is outlined more as guidance than as 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



About 40 miles of Northwest Indiana border Lake Michigan, and are filled with impressive dune structures formed from receding glaciers that once covered the Great Lakes. In that area, 15 miles are protected within the Indiana Dunes

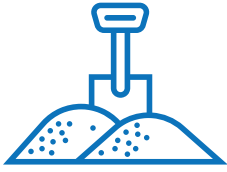
National Lakeshore, which is situated at the southern end of Lake Michigan. However, the lack of management strategies to address the remainder of the state's shoreline proves to be problematic.



BEACH GRADE

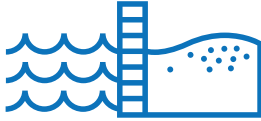
F

Inadequate protection of coastal communities and resources.



Sediment Management: Bad

Indiana promotes the use of beach fill and encourages the beneficial reuse of sediment 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 that 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. While there is a geodatabase of the Lake Michigan Shoreline, which is intended to identify and encourage future development away from hazardous areas, 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.

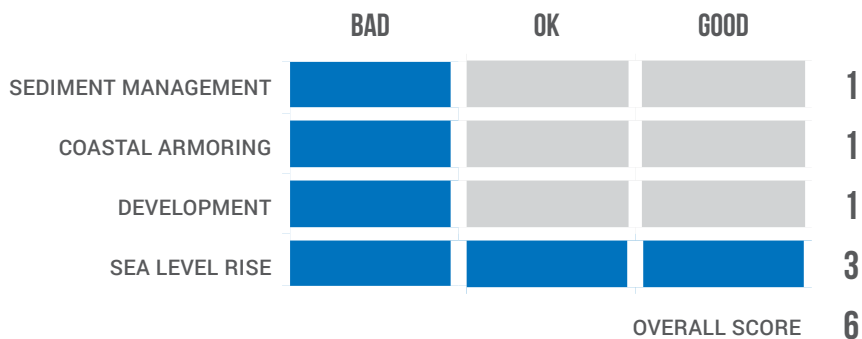
MICHIGAN

GREAT LAKES



Michigan contains over 3,000 miles of freshwater shoreline, the longest within the continental U.S. The state is bordered by three of the Great Lakes, including Lake Michigan, Lake Huron, and Lake Erie. This makes the state of Michigan responsible for an extensive amount of coastal environment to protect. Unfortunately, there are much-needed

improvements in the realm of sediment management, armoring and development policies. However, the state continues to remain stringent on its climate change policies regarding greenhouse gas emissions and sea level rise with a Climate Action Plan.



BEACH GRADE

D

Fairly poor policies, 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 it is 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.



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 that were 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 the 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. The state of Michigan has also created a thorough Community Resilience handbook, which touches on coastal hazards and lake level changes. Broad adaptation methods are discussed but the state still has not developed an approved coastal adaptation plan. While the state does a good job of assessing future risks and developing adaptation plans for ensuring habitat connectivity and the protection of natural environments, it needs to stop current development risks.

Recommendations:

- Prohibit construction on protected dune areas 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.

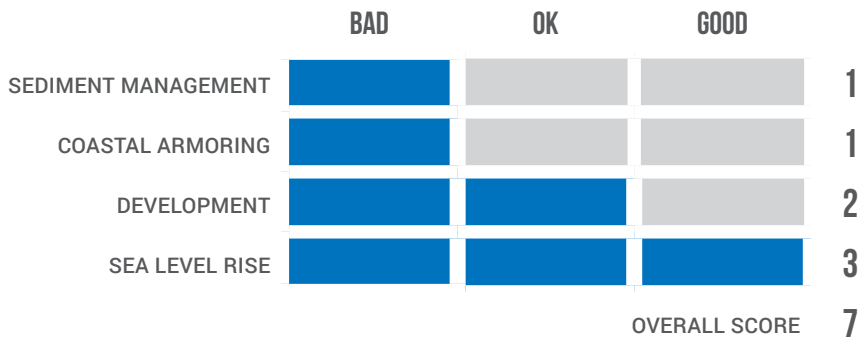
MINNESOTA

GREAT LAKES



Minnesota's 189 miles of Lake Superior shoreline provide ample space for visitors and locals to participate in outdoor activities. The state established a Minnesota Lake Superior Coastal Program which identifies high-priority enhancement areas every five years in order to improve its coastal

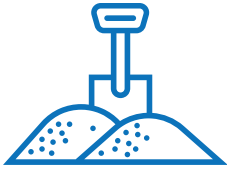
management programs. A current coastal program has yet to be released. Issues, such as climate change, have been at the top of the list, while sediment management and coastal armoring policies continue to lack rigor.



BEACH GRADE

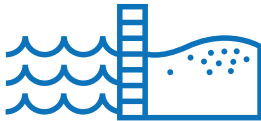
C

Mediocre policies.



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, as there are no explicit testing, monitoring or reporting requirements, there is no assurance that conditions have actually been met. Fortunately, larger beach construction 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 only a recommendation. Policies claim that larger shoreline stabilization structures require permits but specifics 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. In addition, there are 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 has more than 300 miles of Lake Erie shoreline that host an array of attractions, including Marblehead and Catawba peninsulas, notable lighthouses and the world's largest amusement park. However, Ohio's shoreline and the waters of Lake Erie have been subject to non-point source pollution,

recurring algal blooms and heavy industrial development. The state is in need of major re-evaluation of the current coastal management policies in place if they are to adequately protect coastal resources.



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 annually dredged material 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 is some effort 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 is not 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. 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.

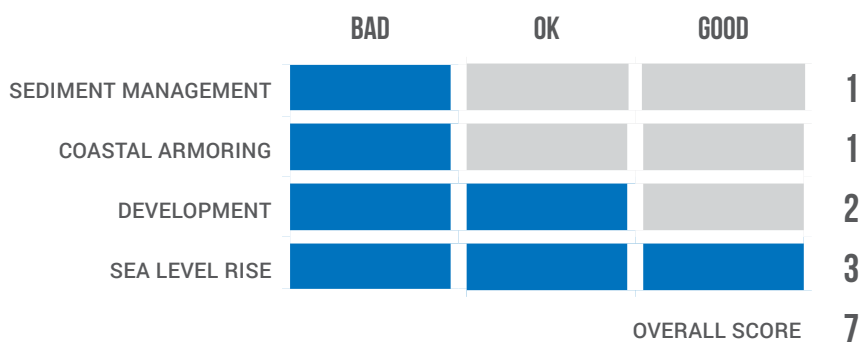
PENNSYLVANIA

GREAT LAKES



With distinct differences in coastal activities on either side, including a calm Delaware Estuary to the East and a bustling Lake Erie to the West, Pennsylvania has some relatively sturdy regulations in place when it comes to coastal development. The state has also made strides to

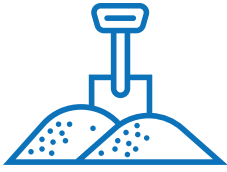
take into account the threats that climate change poses to Pennsylvania's natural shoreline with the *Climate Change Adaptation and Mitigation Plan* created last year. The plan, however, was missing vital components that still need to be addressed.



BEACH GRADE

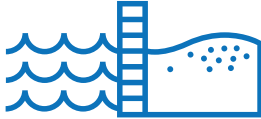
C

Mediocre policies.



Sediment Management: **Bad**

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. 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. While there is a comprehensive regional sediment plan for the Delaware Estuary, there is 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 of 25 feet in established *Coastal Hazard Erosion Areas*, based on the average rate of bluff recession and type of structure. 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 areas, new developments can occur close to the water's edge, between the Ordinary High and Low Water marks, and only require federal and state permits.



Sea Level Rise: **Good**

Pennsylvania has taken proactive efforts to address climate change impacts. Climate change research and planning are required by state law. The Department of Conservation and Natural Resources recently finalized the *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 the thorough analysis of environmental impacts and effectiveness, and develop regional sediment and inlet management plans.
- Require the consideration of alternative stabilization, such as the restoration and protection of dunes and coastal vegetation, in addition to the restoration of 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 a vulnerability assessment and develop adaptation plans for sea level rise and lake level change.

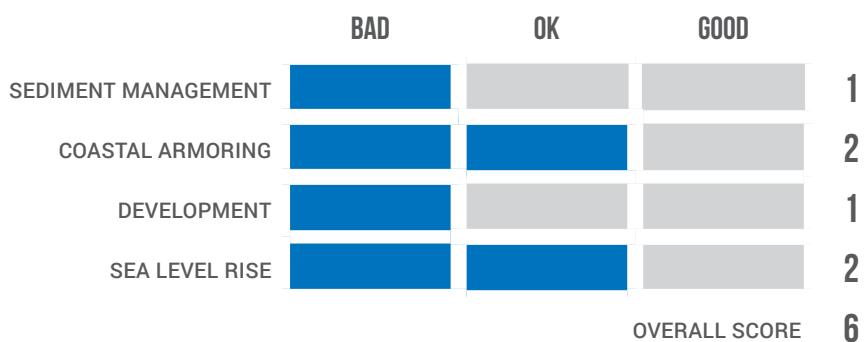
WISCONSIN

GREAT LAKES



In Wisconsin, Lake Michigan and Lake Superior comprise over 800 miles of beautiful freshwater shoreline that provide essential habitat for many species of vegetation. Visitors have access to over 19 harbor towns that provide a place to explore

these shorelines. While the state has some foundational coastal management regulations, quite a few must be strengthened to combat issues, such as rising lake levels and coastal erosion.



BEACH GRADE

D

Fairly poor policies, 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 environmental impacts, along with 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 riprap projects are exempt. Some river basins are not required to meet permit requirements, while natural areas, such as the Lower St. Croix National Scenic Riverway, are more strict and require an erosion control plan and vegetation management plan. Emergency armoring permits are available. While there are explicit conditions that must be met, temporary structures can become permanent as removal requirements are not clearly stated. The state provides guidance for soft structures, such as brush layering and biodegradable breakwaters, but it doesn't require consideration of these methods first.



Development: **Bad**

While the state has a minimum setback requirement of 75 feet, there are many loopholes. After a storm, homes and structures can be rebuilt to the same size. Wet boathouses can also be repaired in a way that extends the 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 that were destroyed or damaged in natural disasters. Make policies 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.



ISLANDS

HAWAII

PUERTO RICO

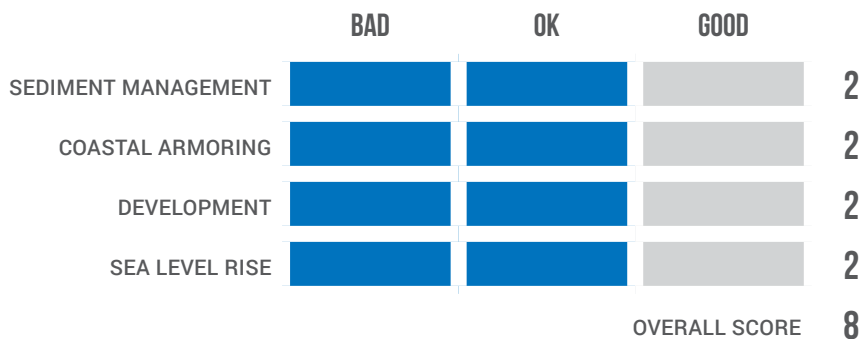
HAWAI'I

ISLANDS



Hawai'i undeniably has some of the country's most breathtaking beaches and islands. Black sand, towering volcanoes and lush forests make the Hawaiian coastline

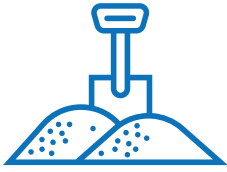
a unique natural environment. However, with a range of coastal resources such as this, it will take comprehensive and stringent management plans to protect them.



BEACH GRADE

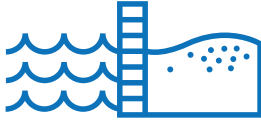
C

Mediocre policies.



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 in place. 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. However, the state is lackadaisical about enforcement. In fact, local homeowners on O'ahu'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. Many counties also 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

While the state has a coastal minimum development setback line, it unfortunately is only 20 feet from the shoreline and provides minimal protection from coastal hazards. Both Kauai and Maui Counties have Beach Management Plans and have established a development setback line of 70 times the erosion rate, plus a range of 40 to 400 feet from sandy shorelines, depending on the 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 while other protections are based on support from the federal government.



Sea Level Rise: OK

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 Kauai.
- 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.

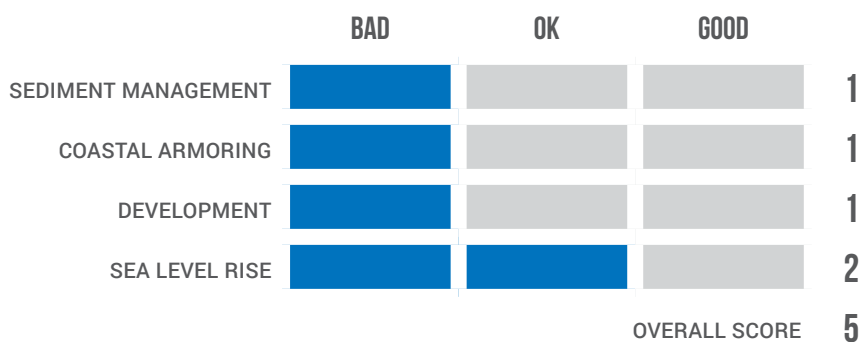
PUERTO RICO

ISLANDS



Located in the Greater Antilles of the Caribbean, this small island continues to attract millions of visitors each year, who are drawn to the lush rainforests, waterfalls and roughly 400 miles of coastline. As Puerto Rico's location makes it vulnerable to storm damage and climate change, which was seen most recently with Hurricane Maria, policies must proactively prepare for future and current coastal hazards. While the island continues to need stronger policies on

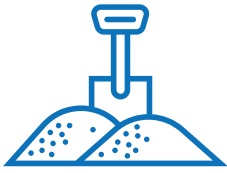
sediment management, development and coastal armoring, Puerto Rico has made important progress in restoring critical coastal ecosystems, including mangroves and coral reefs. Puerto Rico has also increased efforts to promote beneficial adaptation methods, such as living shorelines and green infrastructure. In addition, Puerto Rico would benefit from more federal leadership and funding to support its Coastal Zone Management Program.



BEACH GRADE

D

Fairly poor policies, lacking.



Sediment Management: Bad

Puerto Rico does not have a sand management plan, an inventory of sand resources, policies on beach nourishment standards or an effort to restore natural sediment flow to the coast. The island also struggles with illegal sand mining at river mouths, beaches and sand dunes. Additionally, hillside development and high rainfall cause deposition and sedimentation in waterways. While the director of the Coastal Zone Management office has mentioned a need to develop a sediment management plan and consider the use of beach nourishment projects, there is no funding currently available to accomplish this.



Coastal Armoring: Bad

In 2019, the Department of Natural and Environmental Resources co-hosted a two-day public workshop on living shorelines and released a call for proposals to fund green infrastructure and coastal restoration projects. Unfortunately, Puerto Rico does not have any codified statewide/territory statutes that restrict the construction or repair of hard stabilization structures. After Hurricane Maria, emergency permits for additional armoring were readily available. Fortunately, Puerto Rico has made progress in promoting more proactive adaptation methods.



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. Puerto Rico has also implemented strong programs to protect mangroves and coral reef ecosystems, which provide critical ecological benefits and help mitigate damage from coastal hazards. Codified policies to further protect these areas would be beneficial.



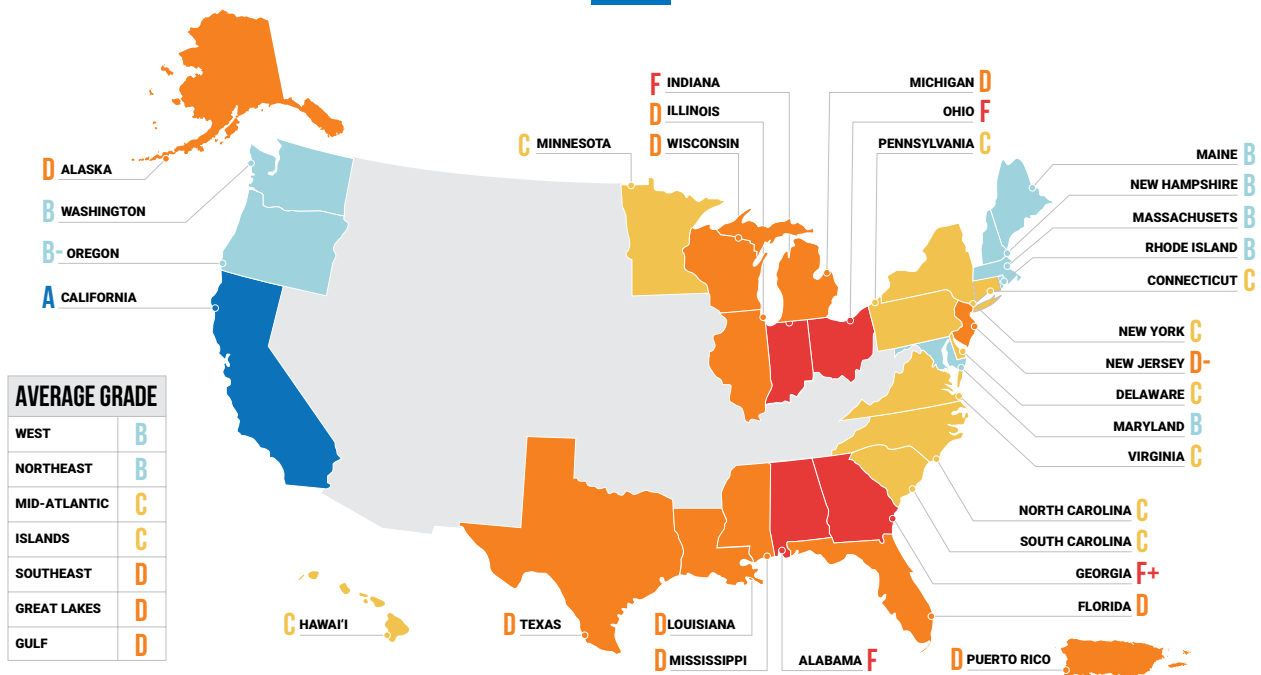
Sea Level Rise: OK

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 beach replenishment 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.
- 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



A 2018 [study](#) by the Union of Concerned Scientists projected that sea level rise will impact 300,000 homes and commercial properties in the U.S. over the next 30 years, causing nearly \$136 billion in damages. We owe it to future generations, and our wallets, to proactively plan now to avoid dire consequences. It is imperative that coastal states and the federal government roll up their sleeves and make hard decisions by planning for climate change impacts, increasing the resiliency of their coastlines and improving building standards. Modifications must address the risk of increasing sea level rise, storm severity and storm frequency, some of which we are already experiencing. Changes cannot be based on historical standards when storms and hurricanes were not as severe or frequent. It's projected that severe storms, which previously only occurred once every 100 years, could be experienced [every year](#) in the near future.

Additionally, the United Nations (UN) released a 2019 report on [climate change impacts to ocean and coastal ecosystems](#), shining a light on the severe threats our oceans and coasts face from climate change. Stark findings include projections of massive coral die offs, larger oxygen minimum-zones, or "dead zones," and more frequent and severe harmful algal blooms and coastal storms. To prevent the most extreme impacts from occurring, global greenhouse gas emissions must be significantly reduced as soon as possible. However, many of these impacts are already inevitable. The UN report highlights that stronger and more proactive coastal resiliency

initiatives are essential to protect coastal infrastructure, local communities, coastal habitats and marine life. These resiliency efforts go hand-in-hand with the policies sought after and recommended by the State of the Beach Report.

This State of the Beach Report brings to light the essential need for improved coastal management practices at the state level to mitigate and reduce the impacts of coastal erosion and sea level rise. This report is intended to help coastal states identify gaps in their current coastal management policies and provide clear recommendations for policy changes that states can take to better protect their coastal resources. Surfrider's findings indicate that many states are not addressing these important issues adequately enough to sufficiently protect our nation's coastal resources.

The policy criteria that prove to be the most difficult for coastal states to achieve are avoiding emergency permits for hard armoring, restricting the repair of hard armoring structures and avoiding beach fill by restoring the natural flow of sediment to the coastline. Alternatively, proactive policies (essentially the 'low-hanging fruit') that seem to be the most frequently accomplished by state agencies, are encouraging the use of living shorelines and coordinating with municipalities to develop local plans and community outreach. Below is a summary of a few problematic trends and highlighted approaches that coastal communities can adopt to improve shoreline management.

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 even when these situations are the result of a 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.

Improvement of Guidance for Local Municipalities

Ideally, 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, it is also imperative that statewide policies are created and applied locally (this is especially true with development and coastal armoring standards). The ultimate goal for coastal preservation should be to have statewide policies that are implemented and adapted at the local level, as currently modeled by the states of California and Washington. Without proper policies, and most importantly, guidance from state agencies, local decision-makers appear to not always adhere to core statewide policies.

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 California 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 proactively 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 paired with restoration of natural sediment flow, 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 and provide a natural buffer against coastal hazards.
- 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 or restored to coastal wetlands (if applicable) to accommodate rising seas. 'Lease back' programs is another innovative adaptation approach where at-risk properties are acquired by the local

governments and 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 prepare for and 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, we must work together to increase awareness of the increasing challenges facing our nation's coasts. Ultimately, our combined efforts can lead to improved 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.		

[CLICK HERE FOR THE SCORECARD OF EACH STATE](#)



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