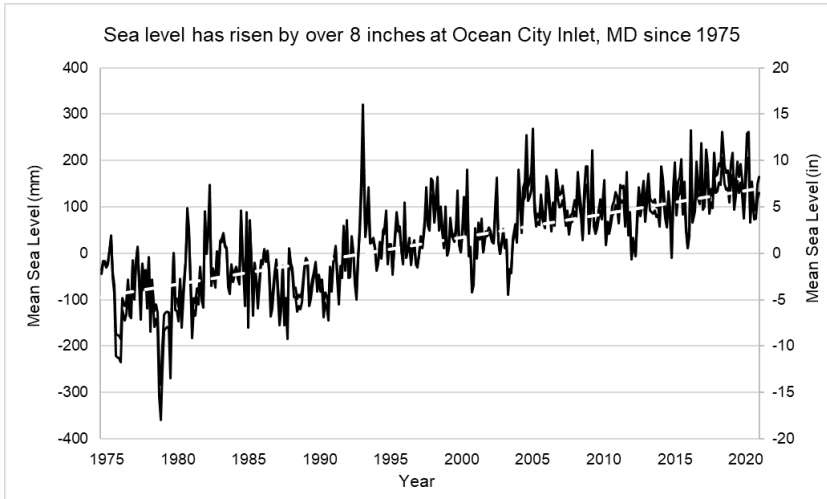


Sea levels are rising.

Two phenomena related to climate change contribute to accelerated global sea level rise:

- **Thermal expansion:** global atmospheric and ocean temperatures are rising, and water expands as it absorbs heat
- **Ice melt:** melting glaciers and ice sheets increase freshwater runoff into oceans

Greenhouse gases trap heat in our atmosphere resulting in rising ocean temperatures. Sources of greenhouse gases include the use of fossil fuels such as coal, oil, and natural gas to power our societies, which releases carbon dioxide and methane into the atmosphere. Other methane sources include emissions from landfills and agriculture.



Beach erosion caused by high waters during a storm in 2009 [NPS]

Since 1975, Assateague Island has observed over 8 inches of sea level rise at the nearby Ocean City Inlet tide gauge in MD, which is operated by the National Oceanic and Atmospheric Administration (NOAA). Sea level could rise by as much as 6.66 feet by 2100.

What is the future of sea level rise at Assateague Island?

NOAA Projections ¹	2050	2100
Intermediate Low	+1.12 ft	+2.20 ft
Intermediate	+1.71 ft	+4.40 ft
Intermediate High	+2.33 ft	+6.66 ft

This table shows projected sea level heights at Assateague compared to today's mean sea level. These projections were developed by NOAA in 2022 based on different climate change scenarios. Projections are a way of visualizing a range of possible futures. They can aid in park planning by helping managers determine which resources are most threatened by sea level rise.



From left to right, these images show the North Ocean Beach parking area and the Oceanside campground areas of Assateague Island with its current water level, with 2 feet of sea level rise, and with 6 feet of sea level rise. Most of the salt marsh, beach, roads, campgrounds, and parking area would be inundated with 6 feet of sea level rise.



How is sea level rise impacting Assateague Island?

As a coastal barrier island, Assateague Island National Seashore encompasses a dynamic array of natural habitats extending from the Atlantic Ocean to the adjacent coastal estuary. Natural coastal processes, including waves, tides, and wind continuously shape and shift the barrier island, but rising sea levels and coastal storm surges are causing more dramatic changes. The diverse natural resources of Assateague, including beaches, dunes, shrub thickets, pine forests, freshwater pools, and marshes, will be impacted by sea level rise.

- Rising sea levels and higher storm surges threaten the freshwater ecosystems and maritime forests beyond the dunes along the Atlantic shore. Overwash and saltwater intrusion can kill freshwater trees and shrubs and impact wildlife populations that depend on the island's freshwater resources for drinking water.
- Recreational opportunities and visitor access are also being impacted by rising sea levels, such as when flood events and storm surges wash away sections of roads that visitors use to get to recreation areas or damage facilities such as campgrounds and visitors centers.



High storm surge during Hurricane Sandy damaged the Bayside Parking Area [NPS]



Water washes over dunes and South Ocean Beach Parking Lot during a storm in January 2016 [NPS]

How is Assateague Island National Seashore responding to sea level rise?

To respond to the challenge of rising waters, the National Park Service employs the **Resist, Accept, Direct (RAD)** framework, which serves as a guide to climate response strategies. Assateague Island National Seashore uses the **accept** strategy of the RAD framework in their management of the park. This strategy focuses on increasing resilience in the park rather than attempting to prevent the flooding and overwash that is occurring as sea levels rise.

- Park managers are creating more resilient facilities by **replacing** old structures with new movable ones. The new restrooms and changing rooms near the beach can be relocated ahead of a storm event so that they are not damaged by storm surge or waves.
- Parking lots and campsites are being **relocated** farther inland and away from dynamic shorelines and dune systems. These new locations can account for the natural inland migration of the dune system that occurs as a result of overwash.
- Asphalt parking lots are being replaced with crushed clam shells to create a more resilient surface. This reduces impacts from flooding and allows for easier clean-up and repairs after a storm event.



Moveable restrooms near the park's beach [NPS]



A flooded oceanside campsite after a storm in November 2009 [NPS]

What can you do to help?

- Reduce your carbon footprint: power down electronics or reduce your thermostat. Go to carbonfootprint.com to calculate your carbon footprint and find ways to make changes.
- Volunteer with organizations working to protect coastal habitats that provide natural defenses against sea level rise.
- Support climate mitigation and adaptation policies. Contact your representatives in Congress to let them know you care.
- Visit coastal areas and support the parks and communities that are taking actions to prepare for sea level rise.

Additional Resources

1. <https://coast.noaa.gov/slr/>: A NOAA SLR viewer tool to access local sea level rise projections at tide gauges and visualize sea level rise scenarios (2017).
2. <https://tidesandcurrents.noaa.gov/>: Access water levels, tide predictions, and other conditions along coasts.
3. [NOAA Coastal Flood Exposure Mapper](#): A tool to visualize coastal hazards as well as societal, infrastructure, and ecosystems exposure to those hazards

Note: The sea level rise projections, storm surge projections, and other information presented here are for general educational and awareness purposes only. They should not be used for site-specific analysis, navigation, permitting, or legally binding activities.