

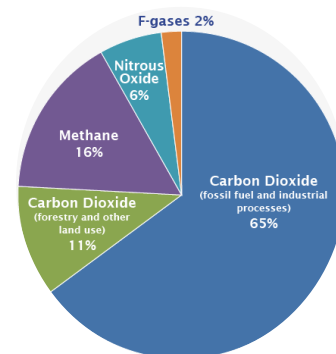


Sea levels are rising.

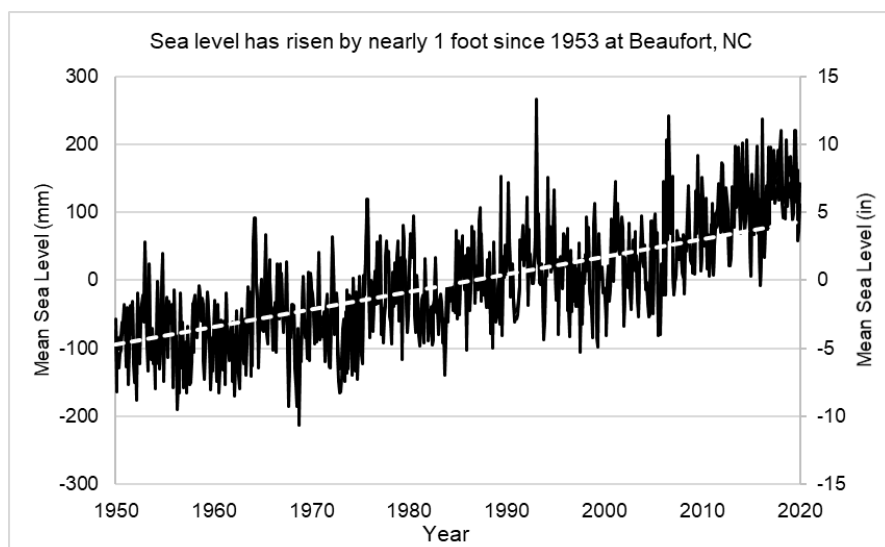
Two phenomena related to climate change contribute to accelerated global sea level rise:

- 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; methane sources also include emissions from landfills and agriculture.



Greenhouse Gas Emissions by Gas



Since 1953, sea level has risen at an average rate of 0.13 in/yr at Cape Lookout based on data from the Beaufort, NC tide gauge, which is operated by the National Oceanic and Atmospheric Administration (NOAA). Sea level could rise by as much as 6.53 feet by 2100.

What is the future of sea level rise at Cape Lookout National Seashore?

NOAA Projections ¹	2050	2100
Intermediate Low	+0.98 ft	+1.97 ft
Intermediate	+1.54 ft	+4.13 ft
Intermediate High	+2.17 ft	+6.53 ft

This table shows projected sea level heights at the seashore 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 Cape Lookout Village and Lighthouse area with its current water level, with 2 feet of sea level rise, and with 6 feet of sea level rise. The red box shows the location of the Cape Lookout Village, and the white box shows the location of the Cape Lookout Lighthouse.



How is sea level rise impacting Cape Lookout National Seashore?

The seashore is a barrier island, so it is a dynamic environment by nature. Wave, tidal, and wind action continuously shape and shift the island, but rising sea levels and increased storm surge are causing more dramatic changes. The park is facing increases in beach erosion, saltwater intrusion, and high-tide flooding, which cause challenges for the natural and cultural resources of Cape Lookout. The seashore is home to beaches, dunes, grasslands, marshes, and maritime forests, which could all be impacted by sea level rise. Additionally, it has two settlements that have been designated on the National Register of Historic Places - Portsmouth Village and Cape Lookout Village - as well as the historic Cape Lookout Lighthouse. A recent vulnerability assessment found that most buildings and roads in these areas have high vulnerability to SLR and coastal hazards.

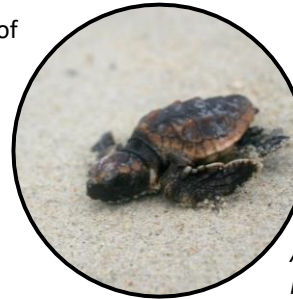
- Rising sea levels threaten dunes, grasslands, forests, and salt marshes. Related salt-water intrusion and elevated groundwater tables also contribute to loss or changes in habitat.
- Sea level rise causes higher mean sea levels, which lead to more frequent high tide flooding of low-lying areas and increased erosion across the island. These processes can damage habitats as well as built structures, such as the Long Point and Great Island Cabins or the Cape Lookout Lighthouse.
- Four different sea turtle species and several sea and shorebird species nest along the beaches of Cape Lookout. These breeding populations are now threatened by erosion and increased flooding of that nesting habitat.



The Cape Lookout Lighthouse [NPS]



Shackleford Maritime Forest [NPS]



A loggerhead sea turtle hatchling [NPS]



Sand washes across the island of Cape Lookout from the ocean side into the grasslands and marshes on the sound side during a storm event [NPS].



An extreme high tide in December 2019 washes under the Long Point Cabins and cuts a scarp in the sand. These flood events will become more common as sea levels continue to rise [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
4. [Cape Lookout Coastal Hazards Assessment](#): A 2017 report summarizing the vulnerability levels of various Cape Lookout assets.

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.