

National Park of American Samoa

Sea Level Rise

National Park Service
U.S. Department of the Interior

Natural Resource Stewardship & Science
Ocean and Coastal Resources Program

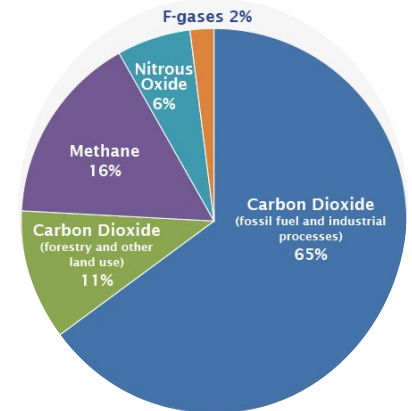


Sea levels are rising.

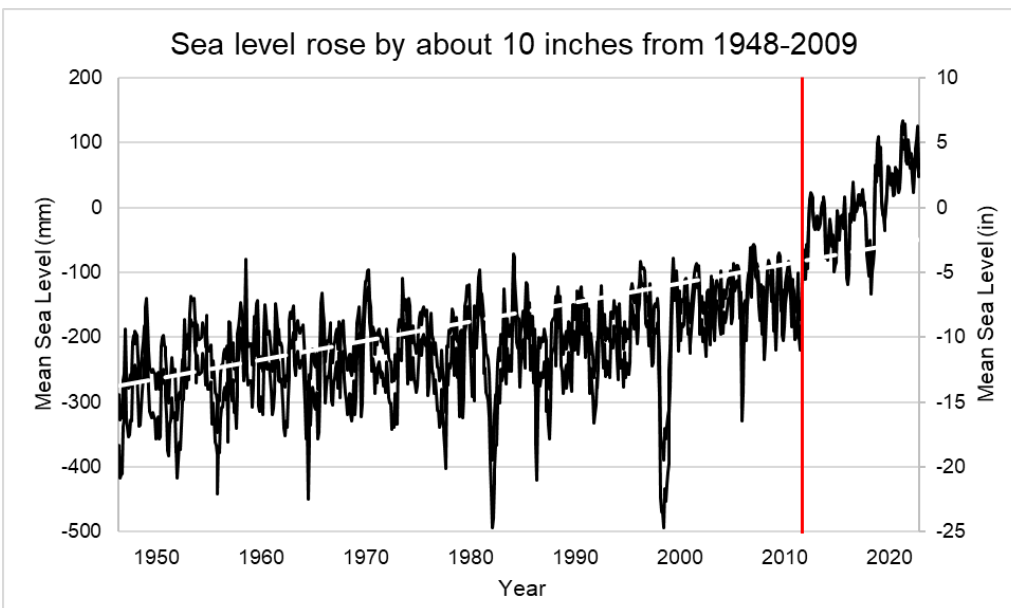
Two phenomena related to climate change contribute to accelerated global sea level rise:

- 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.



Greenhouse Gas Emissions by Gas



From 1948-2009, sea level rose by about 10 inches at the Pago Pago tide gauge on American Samoa (NOAA). An earthquake in 2009 impacted 2010-2020 sea levels (after the red line), so those years are not included in the trend.* Sea level could rise by as much as 5.87 feet by 2100.

**A major earthquake in 2009 caused dramatic vertical land motion. Since the earthquake, American Samoa has been rapidly subsiding, or shifting downward in elevation, which has caused an abrupt rise in relative sea level elevations – an additional 10 inches from 2010-2020.*

What is the future of sea level rise at National Park of American Samoa?

NOAA Projections ¹	2050	2100
Intermediate Low	+0.98 ft	+2.26 ft
Intermediate	+1.15 ft	+3.97 ft
Intermediate High	+1.38 ft	+5.87 ft

This table shows projected sea level heights at the park 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 Nu'uuli village, which is close to the Tutuila Unit of the National Park of American Samoa, at current sea level, at two feet of sea level rise, and at six feet of sea level rise. The light blue colors in the right two pictures indicates land submerged by water. Maps: ESRI.



How is sea level rise impacting National Park of American Samoa?

The National Park of American Samoa is a remote park located on three volcanic islands, Tutuila, Ta'ū, and Ofu, in the South Pacific Ocean. Most of the area on land in the park consists of tropical rainforests, but the park also protects nearly 4,000 acres of coastal and marine habitats, including beaches, coral reefs, and open water. The park also helps to protect the customs, beliefs, and traditions of the 3,000-year-old Samoan culture. For example, there are many areas where the park works with local communities to conduct archeological research. The park's shoreline location and its low elevation make its valuable natural and cultural resources susceptible to impacts of sea level rise, such as flooding, erosion, storm damage, and saltwater intrusion.

- Endangered green and hawksbill sea turtles nest on the islands of American Samoa. However, sea level rise threatens to erode the beaches that serve as their nesting habitat, and frequent flooding could drown the nests.
- The ancient village of Saua on the island of Ta'ū is considered the birthplace of Polynesia and is an important archaeological site. It is located close to the shore and is at risk of damage from flooding and erosion caused by sea level rise.
- The park's coral reefs protect the shoreline from erosion by reducing wave energy during storms. However, sea level rise may enable storm surges and waves to more easily wash over the reef.
- Some of the park's infrastructure may also be impacted by sea level rise. There are many interpretive displays and trails along the coast that could be damaged by rising waters. Coastal roads that provide access to the park might also experience more frequent flooding.



*Grave site in Saua,
Ta'ū. [NPS]*



*Coral reefs in the park
boundary [NPS]*



These ancient grinding stones are representative of the long history of Samoan presence on the islands. Grinding stones were used to sharpen adze blades. The park has many archeological sites that are located near the water that are at risk of damage from flooding and erosion, which will become more common as sea levels 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.
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.