



ANNUAL HIGH TIDE FLOODING OUTLOOK

Center for Operational Oceanographic Products and Services
National Oceanic and Atmospheric Administration

2025



NOAA's Annual High Tide Flooding Outlook (formerly the State of High Tide Flooding and Annual Outlook) is released annually in an interactive, web-based format. In 2023, NOAA began adapting the previous year's Annual High Tide Flooding Outlook into the following portable document format (PDF) to provide interested users with a free, downloadable historical archive. Data from previous years are also available to download for free from our Derived Product API (DPAPI) on tidesandcurrents.noaa.gov.



2025 Annual High Tide Flooding Outlook

Center for Operational Oceanographic Products and Services
National Oceanic and Atmospheric Administration



Overview

Above-normal tides can trigger high tide flooding, disrupting coastal communities. This flooding can occur on sunny days and in the absence of storms. More severe flooding may occur if high tides coincide with heavy rains, strong winds, or large waves. As sea levels continue to rise, our coastal communities will experience more frequent high tide flooding - a National average of 45 to 85 days per year by 2050. Predicting the frequency of high tide flooding in the future helps coastal communities plan for and mitigate flooding impacts.

The Annual High Tide Flooding Outlook provides the number of high tide flooding days predicted for the coming meteorological year (May to April). Data is supplemented with decadal projections for the year 2050, sea level rise scenarios, and high tide flood exposure maps to support long-term coastal planning. Summaries are provided for each region to account for geographical differences at the coast, and are accompanied by regional graphics to demonstrate potential high tide flooding impacts.

National Outlook



Regions:

Northeast
Mid-Atlantic
Southeast
East Gulf
West Gulf
Southwest
Northwest
Caribbean
Pacific Islands



**4 to 8
days likely**

High tide flooding is anticipated to continue with frequency over the next meteorological year (May 2024 – April 2025).

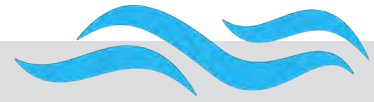
Overview:

Frequencies of high tide flooding continue to increase across the Nation due to the long-term effects of relative sea level rise. Over the 2023-24 meteorological year (May to April) a strong [El Niño](#) cycle drove significant increases, particularly along the Atlantic Coast, contributing to a National average of 7 to 8 high tide flooding days. This year, as we move into [La Niña](#) conditions, most regions throughout the country will experience fewer flood days compared to last year. The Nation is predicted to experience 4 to 8 high tide flooding days for 2024-2025. NOAA is predicting an [above-normal 2024 Atlantic hurricane season](#) that has the potential to increase flooding for coastal communities along the Atlantic and Gulf coasts. Today, the Nation experiences a median of 5 more flood days per year since 2000, a nearly 200% increase.

- 34 stations met or exceeded station records from 2023-24, a steep increase from 8 stations breaking records throughout the 2022-23 meteorological year.
- The Mid-Atlantic region experienced the greatest median number of flood days, 17, due to a combination of high sea level rise rates and strong El Niño influences. The Northeast and Pacific Islands tied for second with regional medians of 13 flood days.
- Nearly half of NOAA's long-term water level stations experienced flooding within the predicted range. Many stations experienced more flooding than expected due to a stronger [El Niño](#) influence than predicted.
- This year, the Pacific Islands and the Western Gulf Coast are predicted to experience the greatest amount of high tide flooding; 5 to 16, and 7 to 15, respectively. These values are still very close to observations for the previous year, and are indicative of more routine flooding based on long-term sea level rise.

Note: Pacific Island flood thresholds were adjusted on June 1, 2023 to better match on-the-ground reports of flooding. This change impacts the Annual Outlooks for the Pacific Islands compared to previous years. Adjusted flood thresholds may not be representative of flooding around [Kwajalein Island](#). Reported flood days represent the number of observed and predicted days where water levels exceed the flood threshold at the Kwajalein station. The number of true flood days may be lower.

Northeast Outlook



States:

- Maine
- New Hampshire
- Massachusetts
- Rhode Island
- Connecticut
- New York
(to Kings Point, NY)



Caption: *Flooding at high tide in Newport, Rhode Island.*

Photo credit: *My-Coast.org, Rhode Island, 10/20/24.*

Location: *Brenton Cove, King Park, Newport, Rhode Island*

Region Overview:

The Northeast continues to experience rapid increases in high tide flooding due to the long-term effects of [sea level rise](#). This region experienced an average of 13 flood days over the 2023-24 meteorological year. Increased high tide flooding during this time is due to [El Niño](#) conditions that elevated flood frequency along the Atlantic coast. This year, the Northeast is predicted to experience 7 to 12 high tide flood days. Increases in high tide flooding for the region are due mostly to ongoing sea level rise. NOAA is predicting an [above-normal 2024 Atlantic hurricane season](#) that has the potential to increase flooding for coastal communities over the coming year.

- 4 out of 5 states in the Northeast set or tied records during the 2023-24 meteorological year: [Bar Harbor, ME](#) (19 days), [Providence, RI](#) (15 days), [Bridgeport, CT](#) (16 days), and [Kings Point, NY](#) (see below).
- [Kings Point, NY](#) observed the greatest amount of flooding in the region, 23 days, more than the predicted, likely due to [El Niño](#) conditions.
- The 2024-25 Outlook predicts [Boston, MA](#) will experience the most high tide flooding in the northeast, 12 to 19 days.

The Northeast is routinely impacted by high tide flooding primarily due to large tidal ranges and coastal storms, which often occur during the winter and spring seasons. Offshore storms typically bring winds from the east and northeast, piling up water over a wide, shallow continental shelf. Though the frequency of high tide flooding varies from year to year, the Northeast experiences a median of 6 more high tide flood days per year compared to the year 2000, an almost 150% increase.



Mid-Atlantic Outlook



States:

- New York (from the Battery, NY)
- New Jersey
- Pennsylvania
- Delaware
- Maryland
- Virginia
- North Carolina



Caption: Cars driving along Long Neck Road between Rehoboth Bay and Indian River Bay encountered flooding due to a simultaneous above normal high tide and new moon, which was exacerbated by multiple rounds of rain and onshore winds.

Photo credit: Driscoll Drones, 2/25/2020

Location: Long Neck Road, Millsboro, Delaware



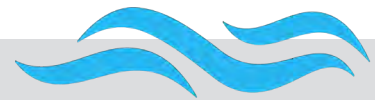
Region Overview:

The Mid-Atlantic continues to experience rapid increases in high tide flooding due to long-term effects of [sea level rise](#). Recent rises in relative sea levels are caused by [land subsidence](#), [global sea level rise](#), and regional oceanographic effects. The Mid-Atlantic experienced a median of 17 flood days over the 2023-24 meteorological year, an increase of 10 days since the previous Outlook. Increased high tide flooding during this time is due to [El Niño](#) conditions that elevated flood frequency along the Atlantic coast that contribute through changes in wind patterns and storm activity. This year, the Mid-Atlantic is predicted to experience 7 to 12 high tide flood days. NOAA predicts an [above-normal 2024 Atlantic hurricane season](#) that has the potential to increase flooding for coastal communities over the coming year.

- 16 stations in the region set or tied records, most notably: [The Battery, NY](#) (24 days), [Baltimore, MD](#) (12 days), and [Sewells Point, VA](#) (23 days).
- [Atlantic City, NJ](#) observed the greatest amount of high tide flooding in the region, 26 days, more than the predicted, likely due to El Niño conditions and an [above-normal 2023 Atlantic hurricane season](#).
- For the 2024-25 Outlook, [Windmill Point, VA](#) is predicted to experience the greatest number of high tide flood days in the region, 12 to 19 days.

The Mid-Atlantic is routinely impacted by high tide flooding throughout the year due to its low lying coastal lands, wide/shallow continental shelf, and exposure to coastal storms. Coastal flooding in this region is predominantly weather driven, including both tropical systems coming up the coast from the south, and non-tropical offshore storms bringing winds and ocean currents from the east and northeast. Though the frequency of high tide flooding varies year to year, the Mid-Atlantic experiences an average of 7 more high tide flood days per year compared to the year 2000, a more than 200% increase.

Southeast Outlook



States:

- South Carolina
- Georgia
- Florida (east coast)



Caption: Cars travel through high water on E. Bay St in front of Sanders-Clyde Elementary School in Charleston, SC. The high tide flooding was due to a perigean spring tide.

Photo credit: Sean Bath, 9/11/2024

Location: Charleston, South Carolina



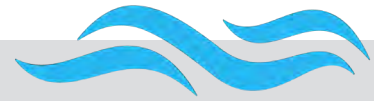
Region Overview:

The Southeast coast continues to experience increases in high tide flooding due to the long-term effects of sea level rise. Recent, rapid rises in relative sea level are caused by land subsidence, global sea level rise, and regional oceanographic effects. The region experienced a median of 10 flood days over the 2023-24 meteorological year. This year, the Southeast is predicted to experience 4 to 7 high tide flood days. NOAA predicts an above-normal 2024 Atlantic hurricane season that has the potential to increase flooding for coastal communities over the coming year.

- Each state in the region set at least 1 record during the 2023-24 meteorological year: [Charleston, SC](#) experienced a record 17 flood days, while further down the coast, [Fort Pulaski, GA](#) saw a record 18 days. [Fernandina Beach](#) in northernmost Florida recorded 10 flood days, more than predicted.
- [Duck, NC](#) observed the greatest amount of high tide flooding in the region, 22 days.
- The 2024-25 Outlook predicts [Trident Pier, FL](#) will experience the greatest amount of high tide flooding with a range of 14 to 20 days.

This region of the U.S. is largely composed of low-lying areas prone to minor flooding. Coupled with land subsidence and global sea level rise, high tide flooding events have been observed more frequently over the past few decades. Due to relatively infrequent storm activity and a narrow continental shelf that limits the depth of storm surge, major flooding events are typically associated with Atlantic hurricanes and strong tropical storm systems. Northern parts of this region are sensitive to El Niño conditions that contributed to an increase in coastal storm activity during the 2023-24 Outlook season. Though the frequency of high tide flooding varies year to year, the Southeast now experiences an average of 5 more high tide flood days per year compared to the year 2000, a more than 500% increase.

East Gulf Outlook



States:

- Florida (west coast)
- Alabama
- Mississippi



Caption: High tide flooding on a sunny day in St. Petersburg, Florida.

Photo credit: Heidi Stiller, NOAA's Office of Coast Management

Location: Coffee Pot Park, St. Petersburg, Florida. September, 2023

Region Overview:

The Eastern Gulf Coast continues to experience increases in high tide flooding due to the long-term effects of [sea level rise](#). Recent, rapid rises in relative sea levels are driven by [land subsidence](#), [global sea level rise](#), and regional oceanographic effects. This region experienced an average of 6 flood days throughout the 2023-24 meteorological year, largely due to sea level rise. This year, the Eastern Gulf Coast is predicted to experience between 3 to 7 high tide flood days. NOAA predicts an [above-normal 2024 Atlantic hurricane season](#) that has the potential to increase flooding for coastal communities over the coming year.

- 4 stations in the region set records during the 2023-24 meteorological year. In Tampa Bay, where coastal communities are seeing an overall increase in high tide flooding, [St. Petersburg, FL](#) experienced a record 6 flood days, and neighboring [Clearwater Beach, FL](#) recorded 7 high tide flood days.
- [Bay Waveland, MS](#) observed the greatest amount of high tide flooding in the region, 11 days, and is predicted to experience the highest range of flooding in the [2024-25 Outlook](#), 10 to 17 days.

This region of the country is routinely impacted by severe weather that often contributes to flood events, with extreme flooding usually caused by Atlantic hurricanes. Coupled with land subsidence and sea level rise, high tide flooding is even more frequent and impactful. Predictions for the region vary year to year due to large-scale weather and ocean current patterns. Overall, the eastern Gulf experiences a median of 3 more high tide flood days per year compared to the year 2000, a more than 200% increase.



West Gulf Outlook



States:

- Louisiana
- Texas



Caption: Persistently elevated water levels in West Bay cause high tide street flooding on Galveston Island around Jamaica Beach.

Photo credit: Sheri Cortez, 6/25/2020

Location: Jamaica Beach, Texas



Region Overview:

The Western Gulf Coast continues to experience rapid increases in high tide flooding due to the long-term effects of [sea level rise](#). Recent rises in relative sea levels are caused by [land subsidence](#), [global sea level rise](#), and regional oceanographic effects. This region experienced a median of 5 flood days throughout the 2023-24 meteorological year, fewer than previous years. This year, the western Gulf Coast is predicted to experience between 7 to 15 high tide flood days, the highest for the continental U.S. NOAA is predicting an [above-normal 2024 Atlantic hurricane season](#) that has the potential to increase flooding for coastal communities over the coming year.

- [Eagle Point, TX](#) experienced the greatest amount of flooding during the 2023-24 meteorological year, 28 days; and is also predicted to experience the most in the [2024-25 Outlook](#) with a range of 21 to 43 days.
- [Galveston Pier, TX](#), situated along the channel closer to the Gulf, experienced the second greatest amount of flooding, 23 days, more than predicted.

The western Gulf is a region frequently impacted by high tide flooding due to high rates of land subsidence, with extreme coastal flooding occurring during Atlantic hurricanes. Though high tide flooding varies greatly from year to year, the western Gulf now experiences an average of 8 more high tide flood days per year compared to the year 2000, a more than 300% increase.

Note: Reported flood days represent the number of observed and predicted days where water levels exceed a flood threshold. The number of true flood days may be lower.

Southwest Outlook



States:

- Central California
- Southern California



Caption: Aerial photo of the king tide at Manzanita Junction, Mill Valley. Water levels were higher than normal due to a perigean spring tide.

Photo credit: California Coastal Commission, 12/4/2021

Location: Manzanita Junction, Mill Valley, California



Region Overview:

The Southwest Coast continues to experience increases in high tide flooding due to long-term effects of [sea level rise](#). Recent rises in relative sea levels are caused by [global sea level rise](#) and regional oceanographic effects. The region experienced a median of 1 to 2 flood days throughout the 2023-24 meteorological year. Increases in high tide flooding in the Southwest are attributed to tidal flooding caused by [El Niño](#) conditions. This year, the region is predicted to experience up to 3 high tide flood days, down from previous years due to [La Niña](#) conditions.

- Similar to previous years, [North Spit, Humboldt Bay, CA](#) experienced record setting flooding over the 2023-24 meteorological year with 19 flood days, more than predicted, likely due to [El Niño](#) conditions. This was the highest number of flood days recorded in the region.
- Stations in the southern areas of this region also experienced more flooding than predicted due to [El Niño](#): [La Jolla, CA](#) observed 6 days and [San Diego, CA](#) recorded 12 days
- This year, the 2024-25 Outlook predicts, [North Spit, Humboldt Bay, CA](#) will again experience the greatest amount of high tide flooding, 7 to 13 days.

High tide flooding outlooks vary by region to account for differences in the coastline that contribute to flood events. In general, the narrow continental shelf and relatively infrequent coastal storms systems limit the frequency of significant flood events although this region can experience damaging flood levels from high waves. Increased flood frequencies in this region are highly dependent upon El Niño conditions, which brings warmer water to the coast and contributes to higher sea levels, increasing the likelihood for minor, frequent flooding. Higher sea levels allow for very high tides, like king tides, to inundate a larger extent, creating greater impacts. Though high tide flooding varies greatly each year, overall, the Southwest experiences an average of 1 more high tide flood days per year compared to the year 2000, a nearly 150% increase.

Northwest Outlook



States:

- Washington
- Oregon
- Northern California



Region Overview:

The Northwest continues to experience increases in high tide flooding due to long-term effects of sea level rise. Recent rises in relative sea levels are caused by land subsidence, global sea level rise, and regional oceanographic effects. The region experienced an median of 2 high tide flood days throughout the 2023-24 meteorological year, predominantly due to El Niño conditions that bring additional oceanographic and atmospheric effects. The fewer number of days can be partially attributed to vertical land motion. This year, the region is predicted to experience up to 7 high tide flooding days.

- Similar to previous years, [Toke Point, WA](#) experienced the greatest amount of flooding over the 2023-24 meteorological year with 13 days, within the predicted range.
- This year, the 2024-25 Outlook predicts, [Toke Point, WA](#) will again experience the greatest amount of high tide flooding, 3 to 16 days.

Flooding in the Pacific Northwest is less tidally driven and more often the result of extreme weather events and ocean currents. The wide, shallow continental shelf of the Pacific coast can amplify storm surge, often flooding low-lying areas. Year to year variations in high tide flood frequency in this region is highly associated with El Niño conditions. High tide flooding in the northwest remains relatively consistent to observed values in the year 2000.

Note: Reported flood days represent the number of observed and predicted days where water levels exceed a flood threshold. The number of true flood days may be lower.

Caption: Minor high tide flooding blocks roadway on Camano Island.

Photo credit: My-Coast, 12/30/2022

Location: Camano Island, Washington



Caribbean Outlook



Locations:

- Puerto Rico
- U.S. Virgin Islands



Region Overview:

The Caribbean does not show a long-term trend in high tide flooding days. Overall, the region did not experience high tide flooding over the 2023-24 meteorological year. This year, the Caribbean is predicted to experience very few flood days, less than 1 day on average. Flooding in this region is less tidally driven. NOAA predicts an [above-normal Atlantic hurricane season](#) that has the potential to increase flood frequencies in the region over the coming year.

- Similar to previous years, [Magueyes Island, PR](#) observed the greatest amount of flooding over the 2023-24 meteorological year, 1 day.
- The 2024-25 Outlook again predicts [Magueyes Island, PR](#) will experience the greatest number of high tide related flood days in the region, up to 1 day.

Flooding in the Caribbean Islands is less tidally driven and more often the result of waves and weather events. For this reason, minor flooding thresholds for the region are typically higher than average high tides. However, this does not preclude flooding that might occur at slightly lower heights, or flooding driven by extreme weather events, like hurricanes.

Pacific Islands Outlook



Locations:

- Hawaii
- Guam
- American Samoa
- Wake Island
- Kwajalein, Marshall Islands



Caption: Water spilling over from Makaiwa Bay into Kalahuipua'a Fishponds during an above normal high tide on July 3, 2016.

Photo credit: Chris Peters

Location: Kalahuipua'a fishponds, at Mauna Lani Hotel, Waimea, Hawaii



Region Overview:

The Pacific Islands continue to experience rapid increases in high tide flooding due to the long-term effects of [sea level rise](#). Recent rises in relative sea levels can be attributed to [land subsidence](#), [global sea level rise](#), and regional oceanographic effects. [El Niño](#) conditions contributed to coastal flooding during the 2023-24 meteorological year. This year, fewer are predicted with the return of [La Niña](#) conditions. The region experienced an average of 13 flood days during the 2023-24 meteorological year. This year, the eastern Pacific Islands are predicted to experience 5 to 16 high tide flood days, the greatest predicted range out of all regions.

- [Nawiliwili, HI](#) on the Island of Kauai experienced a record number of flood days during the 2023-24 meteorological year, 29 days.
- More than half of stations in the Pacific region recorded flooding within the predicted range. The Pacific Islands are predicted to experience the greatest amount of flooding over the coming year.
- [Kwajalein Island, Marshall Islands](#) observed the greatest amount of flooding in the region, 47 days, and is predicted to again experience the highest number of flood days for the [2024-25 Outlook](#), 78 to 97 days.
- Though the frequency of high tide flooding varies from year to year, the Pacific Islands experience a median of 7 more high tide flood days per year compared to the year 2000, a more than 250% increase. This can also be attributed to anomalously warm water that contributes to elevated sea levels and high tide flooding in the region.

Note: Pacific Island flood thresholds were adjusted on June 1, 2023 to better match on-the-ground reports of flooding. This change impacts the Annual Outlooks for the Pacific Islands compared to previous years. Adjusted flood thresholds may not be representative of flooding around [Kwajalein Island](#). Reported flood days represent the number of observed and predicted days where water levels exceed the flood threshold at the Kwajalein station. The number of true flood days may be lower.

Alaska Outlook



Locations:

- Alaska



Caption: An aerial view of the flooding during an above normal high tide in Kwigillingok.

Photo credit: Jesse Igkurak, 6/24/2021.

Location: Kwigillingok, Bering Sea Coast, AK

Region Overview:

NOAA collects valuable oceanographic and meteorological information from water level stations across Alaska. Based on these long-term records, several factors make predicting high tide flooding in the region challenging.

- NOAA is still working to establish consistent and representative high tide flooding thresholds throughout Alaska.
- Many locations experience extreme tide ranges making it less likely a storm surge event will overlap with a high tide and create impacts.
- Coastal topography is steeper than other areas of the U.S., limiting areas that would be exposed to high tide flooding.
- Very few locations have tidal-to-geodetic elevation connections needed to empirically associate and map the extent and severity of inland flooding.
- Infrastructure is often placed in more protected areas away from the coast to limit exposure to extreme conditions in remote areas.
- Relative sea level is decreasing across much of Alaska due to glacial uplift, making coastal flooding less likely in the future.

Additional details and information can be found in [Patterns and Projections of High Tide Flooding Along the U.S. Coastline](#) Using a Common Impact Threshold. Near- and real-time flood conditions can be monitored through the Coastal Inundation Dashboard.

