

US high tide flooding continues to break records

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High tide flooding pushes water onto a walkway along the Boston waterfront near India Wharf in 2016. Credit: MyCoast.org

Coastal communities in eight locations along the East and West coasts experienced record high tide flooding last year—a trend that is expected to continue in 2024. For many communities, the expected strengthening of El Niño will bring even more high tide flood days.

The [2023 Annual High Tide Flooding Outlook](#) documents high tide flooding events from May 2022 to April 2023 at 98 NOAA tide gauges along the U.S. coast. It also provides a flooding outlook for these 98 locations through April 2024 and decadal projections out to 2050.

[High tide flooding](#) is becoming increasingly common due to continued [sea level rise](#), driven in part by climate change. It occurs when tides reach anywhere between 1 to 2 feet above the daily average high tide, depending on location. As sea level rise continues, it no longer takes [severe weather](#) to cause disruptive flooding along the coast.

"Communities across the country are seeing more and more high tide flooding, with damaging effects to [transportation systems](#) and infrastructure—particularly in our most underserved communities," said Jainey Bavishi, assistant secretary for oceans and atmosphere and NOAA deputy administrator. "With sea level rise and a strong El Niño, NOAA's forecasts are a critical resource for our nation's communities as they plan and take proactive action to build their climate resilience."

U.S. coastal communities saw a record-breaking number of high tide flood days in 2022 at three stations. On the Southeast coast, Trident Pier, Florida, saw 16 days, two more than in 2020, and Vaca Key, Florida, saw two days, one more than in 2017. In the Caribbean, Magueyes Island, Puerto Rico, saw two days, which increased from one event in 1998.

Five locations tied their previous records. On the Mid-Atlantic, Kiptopeke, Virginia, tied its 1997 record, with 11 high tide flood days observed. Along the Southeast coast, Fort Pulaski, Georgia, observed 13 days, tying its 2019 record, while Fernandina Beach, Florida, observed nine days, tying its 2015 record. On the eastern Gulf, Naples, Florida, tied its 2017 record of three days. On the West Coast, Port Townsend, Washington, observed 13 flood days, tying its 1982 record.

NOAA predicts that from May 2023 to April 2024 the U.S. will experience between four to nine high tide flood days—an increase from last year's prediction of three to seven days and about three times as many than typically occurred in 2000.

This year, the expected strengthening of El Niño could further amplify high tide flooding frequencies along the East and West coasts. Communities on the Mid-Atlantic and Gulf coasts are expected to experience the most high tide flooding, as El Niño conditions will compound the effects of sea level rise in some areas.

For the Mid-Atlantic, nine to 15 days are predicted, an almost 350% increase since the year 2000. Along the western Gulf, seven to 14 days are predicted, an almost 350% increase since the year 2000.

For the Pacific Northwest, four to 11 high tide flood days are predicted—approximately a 150% increase over the year 2000, and for the Pacific Southwest, one to five days are predicted, an almost 100% increase since 2000.

New monthly tool to look a year ahead

NOAA continues to advance its ability to predict high tide flooding. This year, to help coastal communities better understand when and where high tide flooding may occur, NOAA has released a new Monthly High Tide Flooding Outlook. It provides the likelihood of high tide flooding for each day in the calendar year, up to a year in advance, at NOAA tide gauge locations across the country.

The Monthly High Tide Flooding Outlook does not account for real-time conditions or [weather forecasts](#); however, it provides critical situational awareness about windows of time that have higher flooding risks. As potential flood days grow near, the monthly outlook can be paired with

weather forecasts to understand if an upcoming storm event might compound impacts from already elevated water levels.

"The new monthly outlook represents a leap forward in NOAA's ability to predict high tide flooding at a sub-seasonal scale," said Nicole LeBoeuf, director of NOAA's National Ocean Service. "Armed with more precise and timely data, coastal communities can make informed decisions about flooding risks, and take action to mitigate impacts by closing roads, performing maintenance on storm drain systems, and protecting vulnerable infrastructure."

By 2050, the nation is expected to experience an average of 45 to 85 high tide flooding days per year. Long-term projections are based on the ranges of expected relative [sea level rise of about a foot, on average, across the United States by 2050](#). Data specific to each NOAA tide gauge can be found on the Annual High Tide Flooding Outlook website.

NOAA maintains these [tide](#) gauges as part of the National Water Level Observation Network (NWLON), which includes more than 200 permanent water level stations on the U.S. coasts and Great Lakes. Through the NWLON, NOAA has provided authoritative historic and real-time data, forecasts, predictions and scientific analyses that protect life, the economy, and the environment on the coasts for more than 100 years.

More information: To learn more about high tide flooding in a particular region, visit [NOAA's Regional High Tide Flooding Fact Sheets](#).

Provided by NOAA Headquarters

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