

North Carolina Sea Levels Rising Three Times Faster Than in Previous 500 Years, Study Says

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PHILADELPHIA -- An international team of environmental scientists led by the University of Pennsylvania has shown that sea-level rise, at least in North Carolina, is accelerating. Researchers found 20th-century sea-level rise to be three times higher than the rate of sea-level rise during the last 500 years. In addition, this jump appears to occur between 1879 and 1915, a time of industrial change that may provide a direct link to human-induced climate change.

The results appear in the current issue of the journal *Geology*.

The rate of relative [sea-level](#) rise, or RSLR, during the 20th century was 3 to 3.3 millimeters per year, higher than the usual rate of one per year. Furthermore, the acceleration appears consistent with other studies from the Atlantic coast, though the magnitude of the acceleration in North Carolina is larger than at sites farther north along the U.S. and Canadian Atlantic coast and may be indicative of a latitudinal trend related to the melting of the [Greenland ice sheet](#).

Understanding the timing and magnitude of this possible acceleration in the rate of RSLR is critical for testing models of global [climate change](#) and for providing a context for 21st-century predictions.

"Tide gauge records are largely inadequate for accurately recognizing the onset of any acceleration of relative sea-level rise occurring before the

18th century, mainly because too few records exist as a comparison," Andrew Kemp, the paper's lead author, said. "Accurate estimates of sea-level rise in the pre-satellite era are needed to provide an appropriate context for 21st-century projections and to validate geophysical and [climate models](#)."

The research team studied two North Carolina salt marshes that form continuous accumulations of organic sediment, a natural archive that provides scientists with an accurate way to reconstruct relative sea levels using radiometric isotopes and stratigraphic age markers. The research provided a record of relative sea-level change since the year 1500 at the Sand Point and Tump Point salt marshes in the Albemarle-Pamlico estuarine system of North Carolina. The two marshes provided an ideal setting for producing high-resolution records because thick sequences of high marsh sediment are present and the estuarine system is microtidal, which reduces the vertical uncertainty of sea-level estimates. The study provides for the first time replicated sea-level reconstructions from two nearby sites.

In addition, comparison with 20th-century tide-gauge records validates the use of this approach and suggests that salt-marsh records with decadal and decimeter resolution can supplement tide-gauge records by extending record length and compensating for the strong spatial bias in the global distribution of longer instrumental records.

Source: University of Pennsylvania ([news](#) : [web](#))

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