

Sea level is rising along US Atlantic coast, say environmental scientists

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Professor Ben Horton (University of Pennsylvania) collects salt marsh sediment in North Carolina. Credit: University of Pennsylvania

An international team of environmental scientists led by the University of Pennsylvania has shown that sea-level rise along the Atlantic Coast of the United States was 2 millimeters faster in the 20th century than at any time in the past 4,000 years.

Sea-level rise prior to the 20th century is attributed to coastal subsidence. Put simply, land is being lost to subsidence as the earth continues to rise in response to the removal of the huge weight of ice sheets during the last [glacial period](#). Using sediment cores from the U.S. Atlantic coast, researchers found significant spatial variations in land movement, with the mid-Atlantic coastlines of New Jersey, Delaware and Maryland subsiding twice as much as areas to the north and south.

Coastal subsidence enhances sea-level rise, which leads to shoreline erosion and loss of wetlands and threatens coastal populations.

Researchers corrected relative sea-level data from tide gauges using the coastal-subsidence values. Results clearly show that the 20th-century rate of sea-level rise is 2 millimeters higher than the background rate of the past 4,000 years. Furthermore, the magnitude of the sea-level rise increases in a southerly direction from Maine to South Carolina. This is the first demonstrated evidence of this phenomenon from observational data alone. Researchers believe this may be related to the melting of the [Greenland Ice Sheet](#) and ocean thermal expansion.

"There is universal agreement that sea level will rise as a result of global warming but by how much, when and where it will have the most effect is unclear," said Ben Horton, assistant professor in the Department of Earth and Environmental Science at Penn. "Such information is vital to governments, commerce and the general public. An essential prerequisite for accurate prediction is understanding how sea level has responded to past climate changes and how these were influenced by geological events such as land movements."

The study provides the first accurate dataset for [sea-level rise](#) for the U.S. Atlantic coast, identifying regional differences that arise from variations in subsidence and demonstrate the possible effects of ice-sheet melting and thermal expansion for [sea level](#) rise.

The results appear in the Dec. 1 issue of the journal *Geology*.

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

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