

No longer water under the bridge, statistics yields new data on sea levels

August 8 2017

While the scientific community has long warned about rising sea levels and their destructive impact on life, property and economies of some of the United States' most populous cities, researchers have developed a new, statistical method that more precisely calculates the rate of sea level rise, showing it's not only increasing, but accelerating. The research, methodology and current findings was presented by Andrew Parnell of University College Dublin at the Joint Statistical Meetings (JSM) last week in Baltimore.

The new approach contrasts with previous ways scientists analyzed and came to conclusions about [sea level rise](#) because it is "the only proper one that aims to fully account for uncertainty using statistical methods," noted Parnell, principal investigator of the study conducted collaboratively with researchers at Tufts University, Rutgers University and Nanyang Technological University.

By examining two data sets, one that consisted of measurements from sediment along the East Coast from 2,000 years ago and another that included tide gauges around the world dating back to the 1800s, Parnell and his team discovered the data they gathered from years ago contained uncertainties. For instance, with more tide gauges deployed today than hundreds of years ago, recent records yielded more certainty than older ones. The team honed their statistical models to further take into account such uncertainties and possibly created a statistical first. "This likely is the first time a group of statisticians have had really close examination of [sea level](#) data," said Parnell.

Parnell's team has been able to show that sea level rise on the East Coast has been much less than 1 millimeter (mm) per year for the entire period 0 AD to 1800 AD, and, since then, it's skyrocketed. In fact, they've discovered the rate of sea level rise on the East Coast is the highest it's been for at least 2,000 years, and the rate of [global sea level](#) rise is above 1.7 mm per year, estimated by the International Panel on Climate Change. "Some people argue that sea levels are not rising. We are showing them that sea levels are not only rising, but accelerating," continued Parnell.

From their analysis, researchers made additional observations, including the following:

- An increase in the rate of [sea level change](#) around the time period known as the "Medieval Climate Anomaly"
- A small decrease around the time of the "Little Ice Age"
- A rapid increase after the start of the Industrial Revolution

The new model has recently been put to the test in New York City, where the rate of sea level rise is more than 3 mm per year in an area that currently houses more than \$25 billion of infrastructure at less than 1 meter above sea level. Researchers anticipate the model will be rolled out in other cities along the East Coast and hope governments will be receptive and prepared to take the issue of sea level rise seriously.

Provided by American Statistical Association

Citation: No longer water under the bridge, statistics yields new data on sea levels (2017, August 8) retrieved 28 June 2024 from <https://phys.org/news/2017-08-longer-bridge-statistics-yields-sea.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.