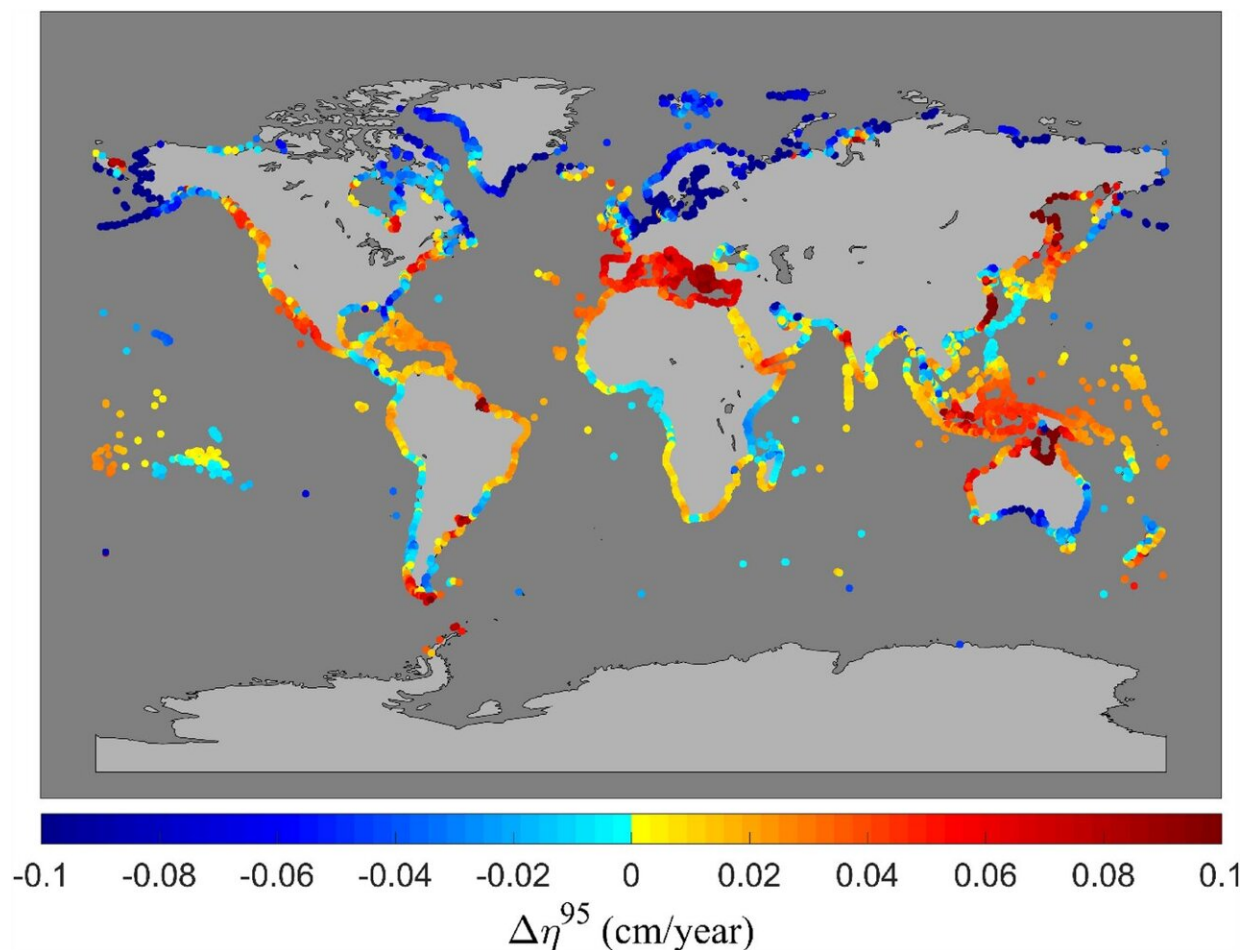


Long-term changes in waves and storm surges have not impacted global coastlines, new study finds

July 19 2023, by Emma Sun



Global distribution of trend in the magnitude of storm surge, $\Delta\eta^{95}$ (95th percentile of water level) (cm/year) over the period of 1984–2014 at DIVA locations. Note values in the Arctic can be smaller than the lower limits of the color bar (up to -0.3cm/year) [Map generated using Matlab Mapping toolbox].

Credit: *Scientific Reports* (2023). DOI: 10.1038/s41598-023-38729-y

Changes in ocean wave and storm conditions have not caused long-term impacts on sandy coastlines in the past 30 years, a new study has found.

Published today in *Scientific Reports*, the study draws on data from 30 years of global satellite and model studies to investigate whether changes in [ocean wave](#) conditions will have an impact on the stability of coastal environments.

The compounding effect of climate change driven variations in waves, [storm surge](#) and sea level rise is projected to lead to shoreline position change along most of the world's sandy coasts.

A team of researchers, led by University of Melbourne Ph.D. candidate Mandana Ganavati and Professor Ian Young, together with colleagues from IHE Delft Institute for Water Education and Deltares of the Netherlands, looked at the changes in shoreline position over the past 30 years globally. These changes in shoreline position were compared to changes in wave and storm surge properties along the same coastlines.

"Although many shorelines around the world are dynamic, responding to wave and storm surge events, these changes tend to be short to medium term. However, we saw no evidence in the last 30 years or so of data that the long-term changes in waves and storm surge are directly causing long-term recession of coastlines," said Young.

Ganavati said it is commonly inferred that [climate change](#)-induced increases in [wind speeds](#) and the [ocean waves](#) are impacting global shorelines.

"Changes in mean sea level due to [global warming](#) are expected to result in recession of our coastlines, in many places threatening homes, infrastructure and ecosystems. However, in a global sense, the magnitude of the observed changes in waves and storm surge over the last 30 years appears too small to have a measurable impact.

"Variations in the supply of sediment from rivers, longshore gradients in sediment transport and human management of coastlines are likely to have had a bigger impact on changing shoreline position than changes in wave and storm surge climate over the last 30 years," Ganavati said.

Climate change and mean [sea level rise](#) is projected to result in widespread coastal recession along sandy coasts through the twenty-first century, potentially disrupting lives and leading to massive socioeconomic losses. This study found the available datasets do not show clear linkages between long-term shoreline change and changes in waves and storm surge over the past three decades.

More information: Mandana Ghanavati et al, An assessment of whether long-term global changes in waves and storm surges have impacted global coastlines, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-38729-y](#)

Provided by University of Melbourne

Citation: Long-term changes in waves and storm surges have not impacted global coastlines, new study finds (2023, July 19) retrieved 21 June 2024 from <https://phys.org/news/2023-07-long-term-storm-surges-impacted-global.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.