

Parts of many coastal cities are sinking faster than the sea is rising

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Rio de Janeiro, Brazil. Credit: Unsplash/CC0 Public Domain

A team of researchers at Nanyang Technological University, working with a group at NASA's Jet Propulsion Laboratory and another colleague at ETH Zürich, has found evidence showing that parts of many big

coastal cities are sinking faster than the sea is rising. In their paper published in the journal *Nature Sustainability*, the group describes using satellite-based radar to measure the degree of land subsidence for 48 of the largest cities in the world.

Prior research has shown that [global warming](#) is melting ice around the world, leading to rising sea levels. This increase in sea levels is a major concern to cities and towns that lie on the edges of the sea. But many cities also face another problem—[land subsidence](#), in which land sinks due to removal of groundwater or gas and compaction of the ground from the massive weight of buildings on top of it.

In this new effort, the researchers noted that rising sea levels compounded with sinking land could result in major problems for [coastal cities](#) in the years ahead. To learn more about the degree of the problem, the researchers accessed and analyzed radar data from NASA satellites that measure the altitude of land across the globe.

In all, the researchers measured land [subsidence](#) for 48 of the largest cities in the world over the years 2014 to 2020. They found that nearly all of the cities they studied were experiencing some degree of land subsidence. And in 44 of them, some areas were sinking at a faster rate than the sea is rising.

Prior research has shown that sea levels are rising at approximately 3.7 mm/year. In their study, the researchers found that some parts of some cities are seeing land sinking at a rate of up to 20 mm/year. The median rate for Ho Chi Minh City, for example was 16.2 mm/year. They also took a closer look at some cities, such as Rio de Janeiro, and found that approximately 2 square kilometers of land inside the city limits will be underwater by 2030 if measures are not taken to hold back the rising sea.

More information: Cheryl Tay et al, Sea-level rise from land

subsidence in major coastal cities, *Nature Sustainability* (2022). [DOI: 10.1038/s41893-022-00947-z](https://doi.org/10.1038/s41893-022-00947-z)

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