Global sea level could rise 15 meters by 2300, study says

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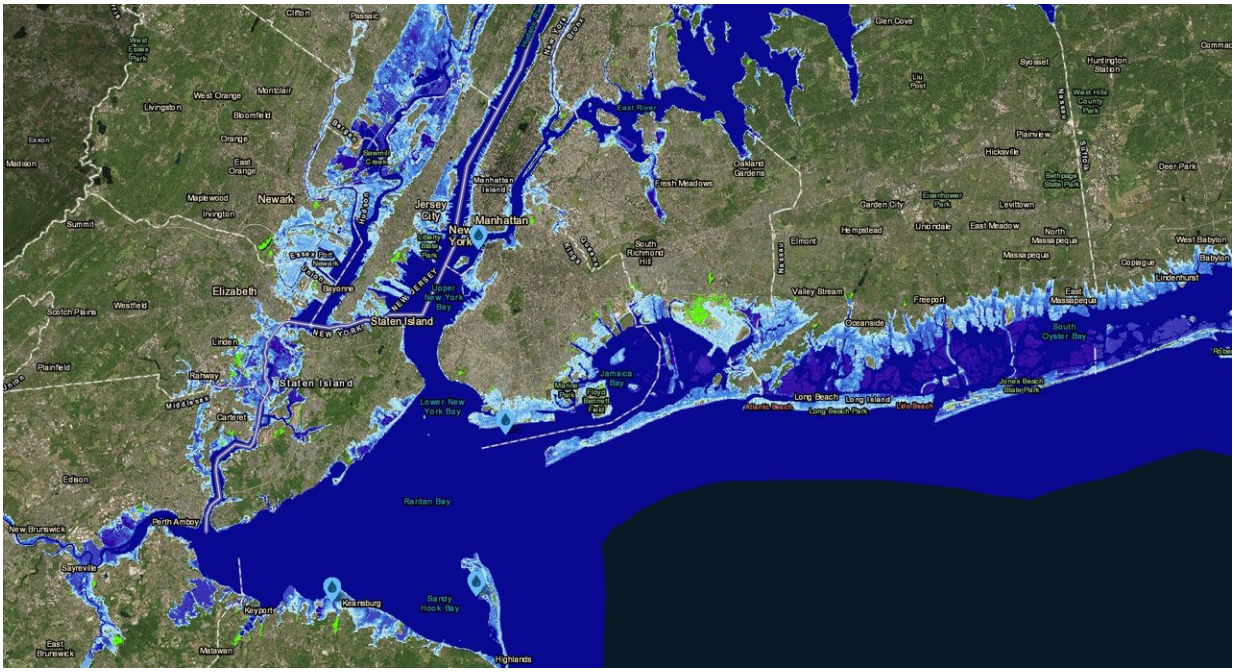

Parts of New Jersey and New York with 8 feet of sea-level rise. An almost 8-foot rise is possible by 2100 under a worst-case scenario, according to projections. The light-blue areas show the extent of permanent flooding. The bright green areas are low-lying. Credit: NOAA Sea Level Rise Viewer

Global average sea-level could rise by nearly 8 feet (2.5 meters) by 2100 and 50 feet (15 meters) by 2300 if greenhouse gas emissions remain high and humanity proves unlucky, according to a review of sea-level change and projections by Rutgers and other scientists.

Since the start of the century, global average sea-level has risen by about 0.2 feet (0.06 m). Under moderate emissions, central estimates of global average sea-level from different analyses range from 1.4 to 2.8 more feet (0.43 - 0.85 m) by 2100, 2.8 to 5.4 more feet (0.85 - 1.65 m) by 2150 and 6 to 14 feet (1.8 - 4.3 m) by 2300, according to the study, published in *Annual Review of Environment and Resources*.

And with 11 percent of the world's 7.6 billion people living in areas less than 33 feet (10 m) above sea level, rising seas pose a major risk to coastal populations, economies, infrastructure and ecosystems around the world, the study says.

Sea-level rise varies over location and time, and scientists have developed a range of methods to reconstruct past changes and project future ones. But despite the differing approaches, a clear story is emerging regarding the coming decades: From 2000 to 2050, global average sea-level will most likely rise about 6 to 10 inches, but is extremely unlikely to rise by more than 18 inches. Beyond 2050, projections are more sensitive to changes in greenhouse gas emissions and to the approaches for projecting sea-level change.

"There's much that's known about past and future sea-level change, and much that is uncertain. But uncertainty isn't a reason to ignore the challenge," said study co-author Robert E. Kopp, a professor in the Department of Earth and Planetary Sciences at Rutgers University-New Brunswick and director of Rutgers' Institute of Earth, Ocean, and Atmospheric Sciences. "Carefully characterizing what's known and what's uncertain is crucial to managing the risks sea-level rise poses to coasts around the world."

Scientists used case studies from Atlantic City, New Jersey, and from Singapore to discuss how current methods for reconstructing past sea-level change can constrain future global and local projections. They also

discussed approaches for using scientific sea-level projections and how accurate projections can lead to new sea-level research questions.

A large portion of sea-level rise in the 20th century, including most of the global rise since 1975, is tied to human-caused global warming, the study says.

More information: Benjamin P. Horton et al, Mapping Sea-Level Change in Time, Space, and Probability, *Annual Review of Environment and Resources* (2018). DOI: 10.1146/annurev-environ-102017-025826

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