05-08-2020

Sea-level rise could exceed one meter by 2100

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Sea-level rise could exceed one meter by the end of this century if global emissions targets are not met, according to a new study led by NTU Singapore.

Based on the findings of more than 100 international experts, high levels of emissions will swell up the oceans much faster than what was previously realized.

The research team surveyed 106 of the world's top sea-level experts to predict how the world's oceans will rise under two conditions – low emissions and high emissions.

The survey was led by Professor Benjamin Horton, the Chair of NTU's Asian School of the Environment. He explained that breaking through the uncertainties of sea-level rise is critical for making informed mitigation and adaptation decisions.

“The complexity of sea-level projections, and the sheer amount of relevant scientific publications, make it difficult for policymakers to get an overview of the state of the science,” said Professor Horton.

“To obtain this overview, it is useful to survey leading experts on the expected sea-level rise, which provides a broader picture of future scenarios and informs policymakers so they can prepare necessary measures.”

In a low-emissions scenario where global warming is limited to 2 degree Celsius, the experts estimated sea-level rise of 0.5 meters by 2100 and 0.5 to 2 meters by 2300.

In a high-emissions scenario where global warming reaches 4.5 degree Celsius, the experts estimated sea-level rise of 0.6 to 1.3 meters by 2100 and 1.7 to 5.6 meters by 2300.

These sea-level rise projections are higher than previous estimates by the International Panel on Climate Change (IPCC).

Study co-author Dr. Andra Garner is an assistant professor of Environmental Science at Rowan University.

“We know that the planet will see additional sea-level rise in the future,” said Dr. Garner. “But there are stark differences in the amount of sea-level rise experts project for low emissions compared to high emissions. This provides a great deal of hope for the future, as well as a strong motivation to act now to avoid the more severe impacts of rising sea levels.”

The experts who participated in the survey identified the Greenland and Antarctic Ice Sheets as the greatest sources of uncertainty regarding sea-level rise. The latest measurements show the ice sheets are melting at an accelerating rate.

On the other hand, the scientists emphasized that the magnitude of sea-level rise can be limited by successfully reducing emissions.

“One of the key take-aways from this study is that our actions today can make a profound difference in how much our coastlines will retreat in the future,” said Dr. Andrea Dutton of the University of Wisconsin-Madison. “That knowledge is empowering because it means that we can choose a better outcome through our actions.”

The study is published in the journal *Climate and Atmospheric Science*.

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