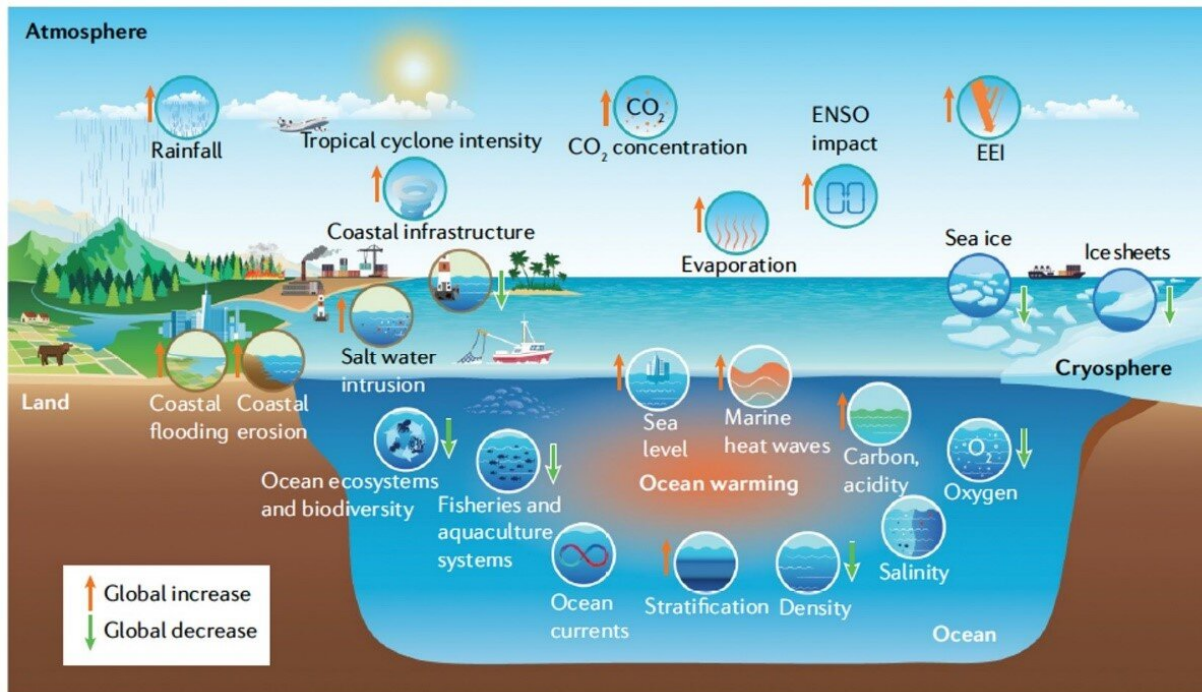


A new comprehensive assessment of ocean warming highlights future climate risks

October 18 2022



Changes in the Earth system linked to ocean warming. Credit: *Nature Reviews Earth & Environment* (2022). DOI: 10.1038/s43017-022-00345-1

A research study just published in *Nature Reviews Earth & Environment* provides new information about how much the planet has warmed and what warming we may expect in the coming decades. This study is important because it motivates us to take actions to mitigate and respond

to climate change. It shows what will happen if we don't take action to slow global warming.

As humans emit [greenhouse gases](#) into the atmosphere, it causes the Earth to warm. The vast majority of heat ends up in the ocean (more than 90%). So, to understand how fast the Earth's climate is changing, we must look to the ocean and track ocean heat content change. The ocean provides the key to understanding both our past and our future. Ocean warming also connects energy, carbon, and water cycles, as it is a key component of the Earth system.

This comprehensive review involved scientists from around the world and included leading institutions in China, France, U.S., Australia, and the U.K. The authors collected temperature information from the world's ocean using a variety of [temperature sensors](#). Some of these temperature sensors are manually placed in the oceans by researchers, others are deployed by cargo vessels, and many are autonomous devices that float in the ocean or are tethered, like a buoy or mooring. By combining many thousands of temperature measurements spread across the globe, the scientists were able to piece together a clear picture of global ocean heat content change back to the 1950s.

With these measurements, the community has produced many datasets to monitor ocean warming. The authors have done a thorough assessment on the validity of each dataset based on the progress in the field during the past years, and then were able to calculate how fast the ocean has warmed.

They found that upper 2000m warming began, unequivocally, at least in the 1950s. The warming has continued since then. Now, the upper 2000m ocean warming is accelerating with the rate more than doubling (from

Citation: A new comprehensive assessment of ocean warming highlights future climate risks (2022, October 18) retrieved 7 May 2024 from <https://phys.org/news/2022-10-comprehensive-ocean-highlights-future-climate.html>

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