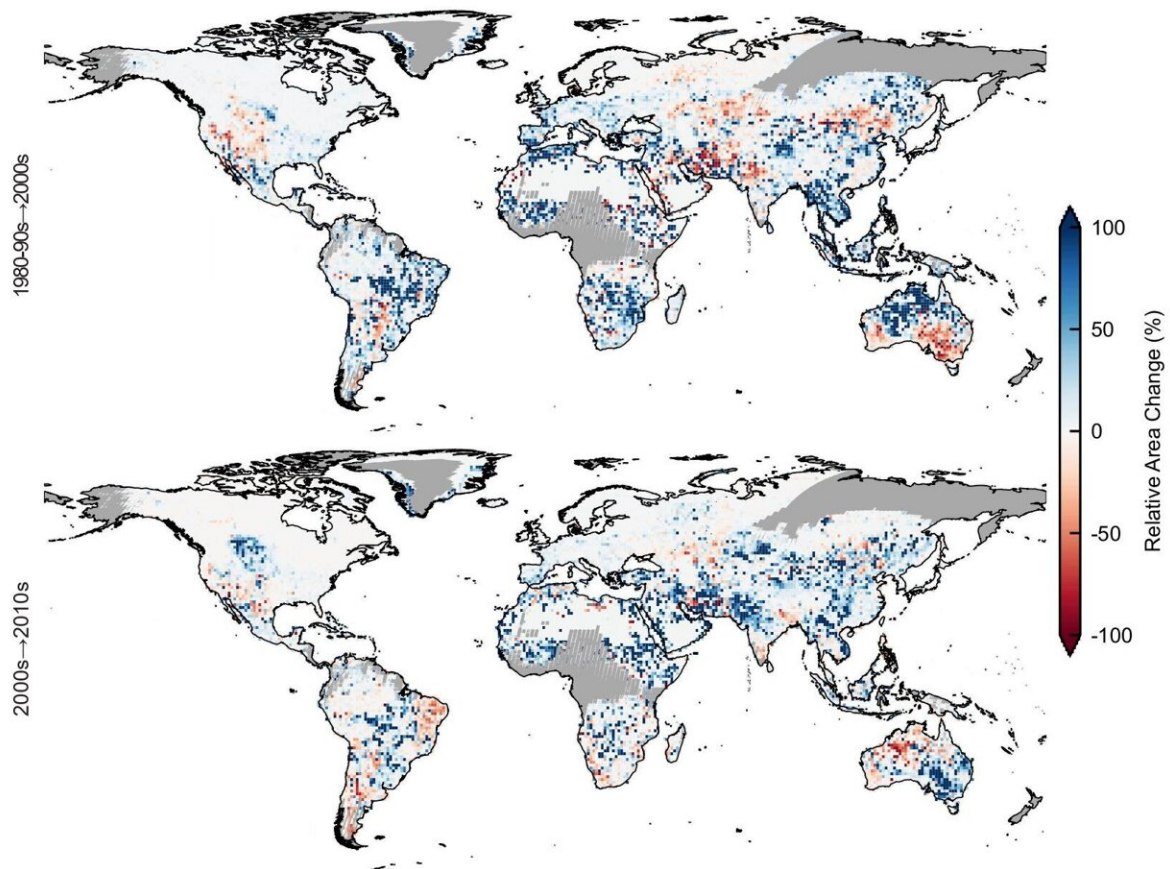


Tracking Earth's many new lakes and their emerging role in carbon emissions

November 28 2022



The figure shows the changes in lake areas during the investigated periods.
 Credit: *Nature Communications* (2022). DOI: 10.1038/s41467-022-33239-3

The number of lakes on our planet has increased substantially in recent

decades, according to a unique global survey of 3.4 million lakes that the University of Copenhagen has taken part in. There has been a particular increase in the number of small lakes, which unfortunately, emit large amounts of greenhouse gas. The development is of great importance for Earth's carbon account, global ecosystems, and human access to water resources.

Bacteria and fungi feeding on dead plants and animals at the bottom of a lake emit vast amounts of CO₂, methane, [nitrous oxide](#), and other gases. Some of these gases end up in the atmosphere. This mechanism causes lakes to act like [greenhouse](#) gas factories. In fact, [freshwater lakes](#) probably account for 20% of all global CO₂ emissions into Earth's atmosphere. Forecasts suggest that [climate change](#) will cause lakes to emit an ever-greater share of greenhouse gases in the future.

This is just one of the reasons why it is important to know how many and how big these lakes are, as well as how they develop. Until now, this information was unknown. Scientific researchers from the University of Copenhagen and other universities have now prepared a more accurate and detailed map of the world's lakes than has ever existed. The researchers mapped 3.4 million lakes and their evolution over the past four decades using high-resolution satellite imagery combined with artificial intelligence.

The survey shows that between 1984 and 2019, the area of global lake surfaces grew by over 46,000 km²—slightly more than the surface area of Denmark.

"There have been major and rapid changes with lakes in recent decades that affect greenhouse gas accounts, as well as ecosystems and access to water resources. Among other things, our newfound knowledge of the extent and dynamics of lakes allows us to better calculate their potential carbon emissions," explains Jing Tang, an Assistant Professor at the

Department of Biology and co-author of the study, which is now published in *Nature Communications*.

According to the study's calculations, the annual increase of CO₂ emissions from lakes during the period is 4.8 teragrams (10¹², or a trillion) of carbon—which is equal to the CO₂ emission increase of the United Kingdom in 2012.

Small lakes, large CO₂ emissions

More and more small lakes (

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