

China's shrinking lakes

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Credit: Shijie Li / Nanjing Institute of Geography and Limnology

China's thriving economy, already large, has been growing at a rate faster than that observed in most developed countries. But there has been a price for this growth. The air in China's largest cities is among the worst in the world because of pollution. And now comes more bad news: China's freshwater lakes have been shrinking.

A new report says that over the period from 1960-2005 Chinese lakes have shrunk in size and in number. The total area of Chinese lakes over that period shrank by 13 percent of their original size, an area just a bit smaller than Connecticut.

Sixty new lakes appeared, mainly in the high altitudes of [Tibet](#). This new water might come from [melting glaciers](#). But, 243 lakes with a size

larger than one square kilometer (roughly half a square mile) vanished all together.

A collaboration of Chinese and American scientists used pictures taken by satellites and a variety of other methods to compare past lake conditions, from the 1960s to the 1980s, to conditions recorded more recently in the period 2005-06.

China is a big place and the lake shrinkage works differently in the northern and southern parts of the country. In the north, which tends to be more arid, the decline of lakes seems to be chiefly caused by changes in climate. Over the period 1951-2000, the [average temperature](#) in the north has increased by 0.02 degrees Celsius per year, more than twice the temperature increase for the south of China.

In the south the decline of lakes is more likely to be related to human activities such as increasing industrial production and lakeside reclamation, including the building of new homes and factories. The new report on lake loss in China is published as a cover story in the journal [Geophysical Research Letters](#).



Aibi lake -- a salt water lake -- is located in the Mengxin lake district of China's Xinjiang Province. In 1972, the water area was about 232 square miles, but was only 163 square miles in 2009, a reduction of 69 square miles. Credit: ISNS / USGS

One of the authors of the report Chuanmin Hu, who works in the College of Marine Science at the University of South Florida St. Petersburg, said that he can't fully correlate shrinking lakes to increased need for water by cities and farms.

"The data for water usage is incomplete and hard to make statistically meaningful analysis," Hu said. "However, it is logical to assume that the rapid industrialization and population increase in south China would lead to increased use of water, which should have been a significant factor in causing lake changes in south China."

Steven Loiselles is a scientist at the University of Siena in Italy. He likes the work of Hu and his Chinese colleagues.

"It is an extremely interesting analysis of the possible consequences of environmental change on inland water bodies," Loiselles said. "It is different from most studies because it examines changes over a massive geographic area, which includes numerous climate zones and a wide range of environmental drivers."

Over the last 10 years, Loiselles and his collaborators have studied lakes in Europe, Africa, and South America and most recently with scientists in China. They are also working with several leaders across East Africa in an effort to manage the so called Great Lakes region around the area of Uganda, Kenya, and Tanzania.

Loiselles said that the new lakes study, which takes into account geological factors such as glaciers in under populated regions along with technological activity in developed areas such as the building of new homes and hydroelectric plants, is exactly what is needed.

"As the availability of freshwater resources becomes more critical in [China](#) and globally, medium term analyses such as this provide important information for policy makers and planners," Loiselles said. "The combination of data sources used [in the Chinese lakes study] will become more necessary as more regional approaches to resource management become important."

Kate Willett, a scientist at the Met Office, which is essentially Great Britain's weather service, urges caution when drawing conclusions from observed changes in the landscape.

"Using [lake](#) number/area/levels as an indicator of climate change is valid but tricky -- you have to be sure of the real reason/reasons behind the

changes," she said.

Willett finds the study of Chinese lakes interesting but wishes the authors had used a longer sampling period as a measure of the current status of the lakes instead of the period across 2005-06, an interval short enough to be influenced by temporary variability in weather.

More information: A half-century of changes in China's lakes: Global warming or human influence? *GEOPHYSICAL RESEARCH LETTERS*, VOL. 37, L24106, 6 PP., 2010. [doi:10.1029/2010GL045514](https://doi.org/10.1029/2010GL045514)

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