



## **Taking the temperature of the world's lakes: Decadal variability and long-term trends in lake surface temperature from in situ and satellite observations**

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Recent studies have shown significant warming of inland water bodies throughout the world. To better understand the patterns, mechanisms, and ecological implications of global lake warming, an initiative known as the "Global Lake Temperature Collaboration" (GLTC) was started in 2010, with the objective of compiling and analyzing lake temperature data from numerous satellite and in situ records dating back at least 20-30 years. The GLTC project has now assembled data from over 250 lakes, with some in situ records dating back more than 100 years. Here, we present an analysis of the long-term warming trends, decadal variability, and a direct comparison between in situ and remotely sensed summer lake surface temperatures from 1895-2009. The results show consistent trends of increasing summer-mean lake surface temperature across most but not all sites. Lakes with especially long records show accelerated warming in the most recent two to three decades, with almost half of the lakes warming at rates in excess of 0.5 °C per decade during the period 1985-2009, and a few even exceeding 1.0 °C per decade.