



# Global Lake Temperature Collaboration: First workshop summary

## Principal Investigators:

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## Workshop sponsors:



Jet Propulsion Laboratory  
California Institute of Technology



40 attendees representing 11 countries

**GLTC Goals**

Utilize *in situ* and remotely sensed lake temperature data to address:

- i. Are global and regional patterns of lake warming (or cooling) over the past several decades concordant across space and time?
- ii. What climatic and geographic factors control these patterns (e.g., air temperature, solar radiation)?
- iii. How do *in situ* records compare with satellite data (e.g., mean values, trends, interannual variability)?
- iv. Do trends in lake surface temperature mimic those in deeper waters, and what does this imply for mixing and stratification?
- v. What are the ecological consequences of changes in lake temperature?

**Workshop**

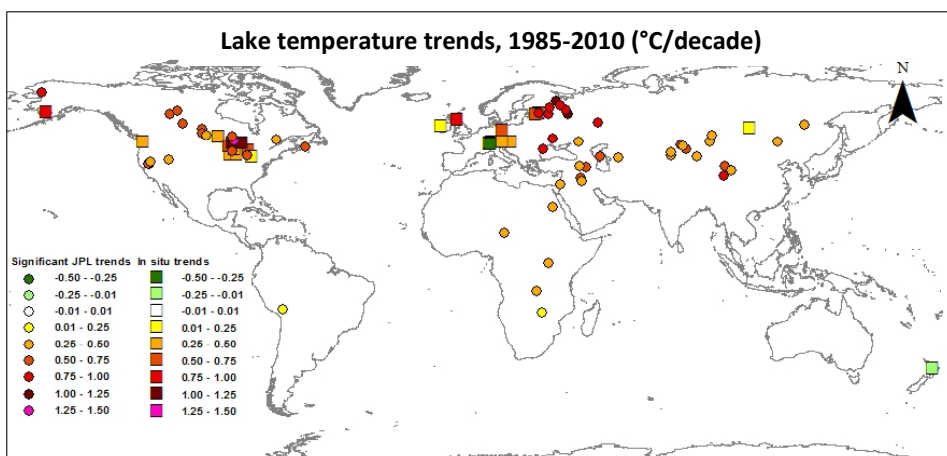
- Hosted in Lincoln, Nebraska; June 1-5, 2012
- 40 participants from 11 countries
- Sponsored by NSF, NASA, and the University of Nebraska-Lincoln's Institute of Agriculture and Natural Resources

**Outcomes**

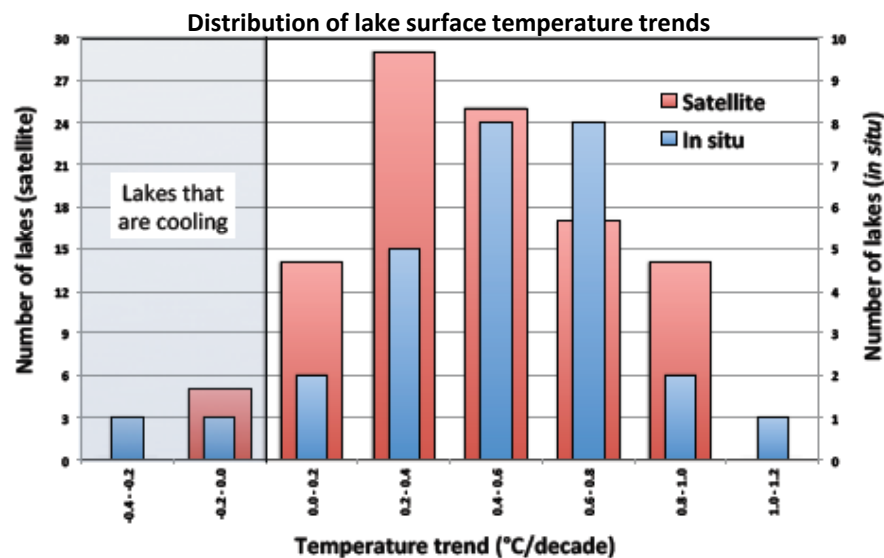
- Compiled additional datasets; number of lakes with both satellite and *in situ* measurements more than doubled
- Found that water temperatures are warming more rapidly than air for many lakes across the world
- Changes in climatic variables other than air temperature may explain more rapid warming, such as solar dimming/brightening
- Anomalous warming/cooling rates vary locally depending on lake processes

**Next Steps**

- Workshop write-up for EOS
- Global synthesis of *in situ* and satellite data for high-profile publication
- Establish process and repository for community data sharing and collaboration among *in situ* and remote sensing scientists
- Follow-on workshops at topical meetings



**Figure 1.** Trends in lake surface temperature from 1985-2010 (in °C/decade), as measured by satellite-based (circles; n = 58) and *in situ* sensors (squares; n = 31).



**Figure 2.** Both the satellite-based and *in situ* records show a large number of lakes (~95%) that are warming.