



An Investigation of Summertime Inland Water Body Temperatures in California and Nevada (USA): Recent Trends and Future Projections

Nathan Healey (1), Simon Hook (1), Sebastiano Piccolroaz (2), Marco Toffolon (2), and Robert Radocinski (1)
(1) NASA Jet Propulsion Laboratory / California Institute of Technology (Nathan.C.Healey@jpl.nasa.gov), (2) University of Trento, Italy

Inland water body temperature has been identified as an ideal indicator of potential climate change. Understanding inland water body temperature trends is important for forecasting impacts to limnological, biological, and hydrological resources. Many inland water bodies are situated in remote locations with incomplete data records of in-situ monitoring or lack in-situ observations altogether. Thus, the utilization of satellite data is essential for understanding the behavior of global inland water body temperatures. Part of this research provides an analysis of summertime (July-September) temperature trends in the largest California/Nevada (USA) inland water bodies between 1991 and 2015. We examine satellite temperature retrievals from ATSR (ATSR-1, ATSR-2, AATSR), MODIS (Terra and Aqua), and VIIRS sensors. Our findings indicate that inland water body temperatures in the western United States were rapidly warming between 1991 and 2009, but since then trends have been decreasing. This research also includes implementation of a model called air2water to predict future inland water body surface temperature through the sole input of air temperature. Using projections from CMIP5-CCSM4 output, our model indicates that Lake Tahoe (USA) is expected to experience an increase of roughly 3 °C by 2100.