



Salty puddles and megalakes, the two faces of tropical lakes

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Continuing increase in water use has led to growing concern over the availability and quality of water resources in the course of future climate changes. Since more than 90% of all available liquid surface freshwater is contained in lakes and reservoirs, these inland waters were the subject of many research programs. Here, we present the simultaneous statistical analysis of 212 lake-level records worldwide based on direct measurements (e.g., lake-gauge and satellite-altimetry measurements) or indirect interference from paleolake-level indicators (e.g., sediments or shorelines of former lakes). The bootstrap statistics of medians and quartiles of the data reveals that tropical lakes are and have been systematically more variable than extratropical lakes across all timescales ranging from 10-1 to 105 years. A Lomb-Scargle powerspectral analysis helps define potential drivers of these hydrological fluctuations, such as the El Niño/Southern Oscillation in the low latitudes and the North Atlantic Oscillation in the mid and high latitudes. The results of this analysis have important implications; (1) it supports the hypothesis that tropical climate changes have been dramatically underestimated in the past, (2) it highlights the vulnerability of the tropics to climate changes and (3) the suggests an important role of the tropics in global climate changes.