PP048-03 - Reconstructing precipitation $\delta^{18}O$ from lacustrine carbonates using $\delta^{18}O$, Δ_{47}, and $\Delta'^{17}O$: a modern case study from Junín, Peru with implications for paleoclimate

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Abstract

Paleoclimate studies often aim to reconstruct oxygen isotopes of precipitation ($\delta^{18}O_P$) because $\delta^{18}O_P$ tracks regional climate change. Lacustrine carbonates are particularly alluring archives of past $\delta^{18}O_P$, because they allow for the construction of long records, with robust chronologies. However, disentangling the influences of $\delta^{18}O_P$, formation temperature, and local hydrology on $\delta^{18}O$ of carbonates ($\delta^{18}O_C$) from lake systems can be challenging, especially if past lake temperatures or water budgets were very different from modern conditions. A recent drilling effort from Lake Junín (*Chinchaycocha*; 11 °S, 76 °W) in the Peruvian Andes has produced well-dated, high resolution (decadal-centennial) records of $\delta^{18}O_C$, which have the potential to provide an unprecedented record of $\delta^{18}O_P$ and climate change in the Tropics from the last 700,000 years, if we can control for the influence of water temperature and lake water evaporation. Here, we use a combination of carbonate clumped isotope paleothermometry (Δ_{47}) and triple oxygen isotope analyses ($\Delta'^{17}O$) from lake waters and carbonates from the Junín region today to understand how they constrain temperature and lake water evaporation, respectively. We report data from two fast-turnover and two slow

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