

[Start](#) | [Grid View](#) | [Author Index](#) | [View Uploaded Presentations](#) | [Meeting Information](#)

GSA Connects 2023 Meeting in Pittsburgh, Pennsylvania

Paper No. 12-5

Presentation Time: 9:10 AM

RECONSTRUCTING CLIMATE AND ENVIRONMENTAL CHANGE FROM LAKE JUNIN SEDIMENTS USING TERRESTRIAL AND AQUATIC BIOMARKERS

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Paleoclimate records from the tropical Andes are scarce, and the variability of glacial-interglacial cycles is still not well characterized. Lake Junin, in the Peruvian Andes, offers a unique and continuous paleoclimate archive that spans the last 700,000 years. Here, we explore the potential of organic compounds in reconstructing Andean paleoclimate over the last 20,000 years. To address this, we first evaluated the preservation of organic matter in the lake's sediments. The Carbon Preference Index (CPI) suggests that n-alkanes have not been altered, and their H isotope composition can be used as paleo precipitation proxies. Furthermore, biomarkers from Eustigmatophyte algae (long chain diols) and diatoms (loliolide/isololiolide) have been identified, and can be used to reconstruct the hydrogen isotopic composition of lake water. The contrast between rainfall and lake water will be a good tool for understanding lake water inputs through time as well as evaporation and aridity. Changes in n-alkane chain length will be used to identify the terrestrial plant (long chain n-alkanes) and aquatic macrophyte inputs (mid-chain n-alkanes), with potential implications for interpreting past lake level change as a function of climate. Finally, distributions of br-GDGTs (branched glycerol dialkyl glycerol tetraethers) will be used to reconstruct past temperature changes. With these proxies, we aim to characterize climate variability at the end of the Last Glacial Maximum (LGM) and the Holocene, with a focus on characterizing climate variability in the light of teleconnections between the South American Summer Monsoon and global climate patterns and their relationship with hydroclimate in the Amazon Basin.

Session No. 12

[T97. Investigating Earth's Past, Present, and Future with Continental Scientific Drilling](#)

Sunday, 15 October 2023: 8:00 AM-12:00 PM

324 (David L Lawrence Convention Center)

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[Back to: T97. Investigating Earth's Past, Present, and Future with Continental Scientific Drilling](#)[<< Previous Abstract](#) | [Next Abstract >>](#)