Timing of Late Quaternary Climatic Events in Subtropical South America, Determined by U-series Dating of Evaporites

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Laguna Mar Chiquita is an endorheic saline lake located in the subtropical plains of Argentina. The site lies in the path of the South American Monsoon System (SAMS), affected in general by easterly derived moisture; lake levels, lithology, and sediment geochemistry reflect changes in this associated climate systems. Lake cores obtained from the lake are assumed to cover the past ~25,000 years of depositional history, based on previous studies in the region. The sediments in the cores alternate between organic rich material and evaporite-rich sediments (carbonate, gypsum, and halite), reflecting changes in the lake levels. Here we will report on age dates of evaporite minerals from a single core using U-Th disequilibrium. Our results complement existing ^{14}C dates and allow us to generate a more accurate timeline of the region's paleoclimate. Evaporites from dry periods were collected at 120–382cm depths in Core TMC02-2 from Laguna Mar Chiquita; these materials were dated using an isochron and total dissolution method. Preliminary results indicate a relatively high (~40 ppb) uranium concentration in present-day lake water. Uranium concentration in the evaporite-rich sediments ranged from 1.1–23.5 ppm. Evaporite minerals contained relatively low concentrations of Th. The organic fraction in the lake core varied from 3–77 wt% according to Nb concentrations (which is insoluble). These data are crucial for obtaining U-series dates successfully and suggest that correction for dissolved ^{230}Th in the lake is negligible, whereas a correction for detrital ^{230}Th is necessary. The U-series dating effort will help us to better understand major changes in precipitation of the area, specifically periods of aridity during and after the Last Glacial Maximum (LGM) and the development of the SAMS in the Latest Quaternary.