CHANGES IN CENTRAL TEXAS MOISTURE DISTRIBUTION DURING THE LATE PLEISTOCENE-EARLY HOLOCENE INFERRED FROM A SPELEOTHEM RECORD

CHRISTINA JAMES[1*], JAY BANNER[1], DAN BREECKER[1], ERIC JAMES[1], NATHAN MILLER[1], ALEXANDRA NORONHA[1], LAWRENCE EDWARDS[2], PU ZHANG [2]

[1]Jackson School of Geosciences, University of Texas at Austin, Austin, Texas, 78712, USA

[2]Department of Geology and Geophysics, University of Minnesota, Minneapolis, Minnesota, 55455, USA

*christina.james@utexas.edu

Speleothem proxy records have been used to reconstruct changes in moisture distribution in the semi-arid SW US during the Younger Dryas northern hemisphere cooling event (YD, 12,900-11,500 years before present) and early Holocene. In central Texas, a speleothem record (sample CWN-4; Feng et al., 2014) records a hiatus in growth from 12.3 – 10.1 ka and two speleothem records from New Mexico and Arizona (Asmerom et al., 2010; and Wagner et al., 2010) also show a cessation in growth near the end of the YD. This consistent cessation in growth among all three records across an approximately 1,400 km transect suggests a drier climate in the SW US as the climate transitioned from the colder YD to the warmer Holocene. However, rigorous replication is needed along this transect to better constrain regional climate conditions, and therefore, we present a speleothem climate-proxy record collected from a central Texas cave (McN-1) located approximately 150 km northeast from CWN-4. The importance of developing a robust age model is intrinsic to understanding the timing of changes in moisture during the YD-Holocene transitional boundary. We use two chronometers to constrain our calculated ages, which involve both U-series and radiocarbon measurements. In total, we measured 21 U-series ages and 10 radiocarbon dates which span ~12,100-6,500 years. Several of our U-series samples contained concentrations of ^{232}Th that were > 1500 parts per trillion, indicating detrital contamination, which would affect age accuracy. We, therefore, measured two ^{230}Th-^{238}U isochrons to constrain the initial ^{230}Th/^{232}Th and reduce the age uncertainty for the U-series ages. A model was developed using the Monte Carlo simulation-based statistical software *COPRA*, which uses measured U-series ages as inputs. The radiocarbon dates, determined independently, are in general agreement with the U-series age model. The age data allow us to compare growth rates among samples across the SW US and show that McN-1 slows in growth rate near the termination of the YD, similar to CWN-4, and the New Mexico and Arizona records, and suggests regional drying occurring during the Pleistocene-Holocene transition.

X_____
Jay Banner