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A Late-Pleistocene - Early-Holocene Luminescence-Based Chronology of Pluvial Lake Clover, Nevada, USA

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Pluvial lakes occupied many topographically closed basins in the southwestern US during wetter times of the Quaternary. Ridges of coarse sand and gravel constructed by storm waves on these lakes are unequivocal testimony to the former presence of large bodies of water. Given the aridity of the modern climate in this region, and the corresponding lack of widespread surface water, pluvial lakes are important indications of prehistoric changes in effective precipitation (precipitation - evaporation). Chronologies of lake level change are therefore useful in interpreting past climatic variability. We are using optically-stimulated luminescence (OSL) dating to create a lake level chronology for Lake Clover (northeastern Nevada, USA), which had a surface area of $\sim$800 km^2 at its maximum extent. Samples (n=12) were obtained from a series of well-developed beach ridges in the north-central part of the area inundated by Lake Clover. Samples were collected at depths of $\sim$80 cm below the surface in hand-dug pits on the crest of each beach ridge. Ten samples represent individual beach ridges spanning $\sim$15 m of elevation, and two additional samples were collected from the highest and lowest shorelines as replicates. Samples were processed in the Middlebury College Luminescence Laboratory using standard procedures to isolate quartz in the 80-250 μm fraction. Preliminary results obtained using the SAR protocol and a Daybreak 2200 OSL reader suggest that Lake Clover was present in the early Holocene. This result is unexpected, because gastropod shells from two different sites along the highstand ridge of Lake Clover yielded late Pleistocene ages in a previous study. However, previous attempts to apply OSL dating to Lake Clover shorelines, with analyses made in a different laboratory, also yielded relatively young ages spanning the Pleistocene-Holocene transition. Reworking of older shells in newer storm deposits may account for the discrepancy between OSL and ^{14}C ages if the shorelines are truly of early Holocene age. For now, additional efforts are being focused on cross-checking and buttressing the luminescence results.