



500,000 years of water table fluctuations recorded in Devils Hole 2 cave from southwestern Nevada, USA

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Evidence for large reoccurring Pleistocene lakes in the Great Basin region of North America suggests that this modern day arid landscape underwent drastic climate fluctuations in the past. We aim to reconstruct the history of water table fluctuations in the discharge area of the Ash Meadow groundwater flow system since 500 ka BP. To do so, we have analyzed a series of carbonate cores drilled at varying elevations above the modern day water table from the walls of Devils Hole 2 cave in southwest Nevada, USA. Petrographic and morphologic differences between calcite precipitated below (mammillary calcite) or at (folia) the water table in this cave record past variations in water table elevation. A total of ten cores were drilled between 0.8 and 15.1 m above the modern day water table. Each core includes alternations between mammillary calcite to folia, with an increasing occurrence of folia in higher elevation cores, suggesting multi-meter variations in past water table elevation. Over 50 high-precision ^{230}Th dates have been measured at the mammillary calcite to folia boundaries of each core. Preliminary results show multi-meter water table fluctuations which appear to follow interglacial-glacial cycles from 500 ka to present day, such that water table high-stands coincide with glacial periods. Observed maxima in water table levels are likely correlated to periods of increased precipitation within the catchment area during glacial (pluvial) periods, which is consistent with paleoclimate records in this region. Preliminary results suggest water table levels peaked (reaching +5.5 m or higher than present day water table) at 461 kyr, between 320 and 250 kyr, between 196 and 137 kyr, and between 67 and 20 kyr BP, largely coinciding with glacial periods. Periods in which water table levels reached the lowest elevation sampled (+0.8 m) occurred at 240 kyr, 116 kyr, and 5.7 kyr BP, largely coinciding with interglacial periods.