



Speleothems in the desert: Glimpses of the Pleistocene history of the Death Valley Regional Groundwater Flow System, Nevada and California

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Death Valley in eastern California holds North America's record for the deepest, hottest and driest place. Despite these unfavourable boundary conditions speleothems are present in this hyperarid depression and the surrounding deserts and provide unique insights into long-term regional climate change and landscape evolution of this tectonically and geomorphologically highly active region.

Most of the speleothems are inactive and exposed due to tectonic uplift and erosion. They differ from common speleothems, because the majority formed under phreatic conditions as part of a regional groundwater flow system that is still active today. Data from three sites will be discussed illustrating the spectrum of speleothem deposits and their modes of formation.

At Devils Hole, the thermal aquifer and the associated subaqueous and water-table speleothems can be directly accessed and provide a record reaching back about 1 million years. At Travertine Point, close to modern discharge points of this large groundwater flow system, phreatic speleothems form near-vertical veins up to about 2 m wide showing evidence of high flow rates along these fractures, which are connected to fossil spring tufa deposits. Finally, outcrops along Titus Canyon expose several generations of speleothems documenting the progressive lowering of the regional groundwater table. The youngest calcite generation records the transition towards vadose conditions 500-400 ka ago.