

## **Speleothem Archives Of Gibraltar Caves: Their Record Of Environment And Regional Climate Over Multiple Ice Age Cycles**

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The Rock of Gibraltar contains many solution caves which initially formed near sea level and now span elevations to over 300m as a result of slow uplift over time. In the modern climate, Gibraltar holds an important position near the southern limit of the tracks taken by the depressions that deliver rainfall to Europe from the North Atlantic sector of the atmosphere. We present the results of comprehensive cave monitoring, climate-proxy calibrations and twenty six dated speleothem records to reconstruct a proxy record of precipitation, sea level and environmental change over the past 500ka. Monitoring in St. Michaels and Ragged Staff caves has been carried out since 2004 by monthly sampling and deployment of logging instruments which reveals that speleothem growth is most strongly influenced by seasonally reversing cave ventilation that permeates the entire rock. The results provide unprecedented insight into how cave environments respond to seasonal change, variations in sea level and neotectonic uplift and the ways that regional climate is recorded as chemical proxies. We are now creating a detailed chemical record which is continuous for the last 250,000 years along with intervals that extend the record beyond marine isotope stage 11, spanning the last five glacial cycles.