

Description of Additional Supplementary Files:

Supplementary Data 1: BA14-1 and BA18-4 U-Th dating report

Supplementary Data 2: Data of BA14-1 and BA18-4 $\delta^{18}\text{O}$ values, $\Delta^{18}\text{O}$

Supplementary Data 3: Data of BA14-1 and BA18-4 Sr/Ca ratios

Supplementary Movie 1: Thirty-year window of running correlation between winter (December-February) precipitation and NAO index during 1836-2014 C.E based on NCAR/NCEP

Reanalysis v3 (<https://www.esrl.noaa.gov/>)

Maps were generated using KNMI climate explorer (<https://climexp.knmi.nl/>).