



## **Northeast Greenland Caves Project: first results from a speleothem-derived record of climate change for the Arctic**

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Multiple lines of evidence currently exist that demonstrate the climate is changing across our planet, and that the Arctic in particular is highly sensitive to these changes, warming up twice as fast as the global average. Understanding how the climate in the Arctic will develop in the future and its subsequent effects is thus a major concern. In order to improve understanding of the climate system within the Arctic, we have collected a suite of calcite flowstone samples from solution-formed caves in the Ordovician-Silurian Centrum limestone of Kronprins Christian Land, Northeast Greenland. Under contemporary conditions, the region is arid, barren, and permanently frozen, however, the presence of these caves and thick flowstone deposits indicates a previous milder climate.

During the summer of 2015, 26 caves were documented at 80.4 degrees north, and 16 speleothem samples collected. Here we present the results of the first U-Th dating and stable isotope analyses. U-Th ages show that the flowstone was deposited intermittently between 220 and 500 thousand years ago (ka) with additional smaller growth periods at c. 108 and 5.7 ka, thus indicating the presence of flowing water at these times.  $\delta^{18}\text{O}$  of the speleothem calcite varies between c. -12 and -16.5 ‰ and displays millennial-scale variability. Our initial results thus demonstrate the potential of these speleothem deposits for extending our knowledge of Greenland's climate beyond the limit of the Greenland ice cores.