Exmouth stalagmites reveal more climatic history

December 17 2013, by Aaron Fernandes

More than 300 caves are scattered across WA's Cape Range Peninsula along with spectacular gorges like Yardie Creek.Credit: Salleelee

Paleoclimatic reconstructions from West Australian stalagmites have demonstrated how historic climatic events still determine Australia's current climate variability.

Researchers from across Australia and the United States have profiled stalagmites from cave C126 in WA's Cape Range Peninsula to produce a high-resolution, continental paleoclimate record from the Indian Ocean sector of Australia.

Lead researcher Rhawn Denniston of Cornell College, USA, says the record, which spans the Last Glacial Maximum, deglaciation, and early

to mid-Holocene, is the first of its kind.

"It goes without saying that Australian societies are closely tied to climate," Prof Denniston says.

"The more we understand about how things have occurred in the past, the better we can develop a frame of reference for current and future climate.

"The first thing the results illustrate is how much we still don't know about the nature, timing, and drivers of climate variability in this part of the world over the last glacial period.

"However, we do see events that are synchronous to and consistent with other regional events, some of which have ties to far-flung regions such as the North Atlantic."

The stalagmite analysis found evidence of such an event which had global significance.

"A climate anomaly occurred at the site during a period called Heinrich Stadial 1, about 16,000 years ago," he says.

The event was likely driven by changes in ocean circulation originating in the North Atlantic.

Prof Denniston says the impact of Heinrich Stadial 1 has been felt in other parts of the world too including the Indo-Pacific, China, Brazil, and parts of Africa and Europe and has been tied to climate variability in southern Australia.

"It is the most prominent event in our record, and in other recently published records from the Kimberley, suggesting that it had a

widespread impact across much of Australia," he says.

The stalagmite samples were sliced in half vertically, with material milled out for dating and chemical analysis.

The dating involved extracting and measuring tiny abundances of uranium and its radioactive daughter thorium.

The research builds on previous studies on stalagmites in China, which show variability in the east Asian summer monsoon over decades to hundreds of thousands of years.

"Other work, largely from lake records and ocean sediments, conducted in and around areas of southern Australia suggest that precipitation moving north from high latitudes was also highly dynamic and influenced the climate there over the last several tens of thousands of years," he says.

Provided by Science Network WA

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