New Southern Hemisphere climate data provides clearer global picture

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Field work in the Indian Ocean - This coral off the Broome coast, Western Australia, stores information about past climate. Credit: Eric Matson Australian Institute of Marine Science

A new international study has published the most comprehensive Southern Hemisphere reconstruction of past climate records, revealing a clearer climate picture of the globe's temperature history than ever before.

The study revealed that over the past 1000 years temperature variations have differed greatly between the two hemispheres, yet it confirmed they shared the one warm period after the 1970s.

Led by the Oeschger Centre at the University of Bern, the Swiss Federal Research Institute WSL and the University of Melbourne, the study Inter-hemispheric temperature variability over the past millennium was published today in the journal *Nature Climate Change*.

Co-author Dr Joelle Gergis, ARC Fellow from the University of Melbourne, said the study finally put the Southern Hemisphere on the map in terms of recording past climate variations over the past 1000 years.

"Our findings showed there were considerable decade-to-decade regional temperature variations in the Southern Hemisphere, that were different to the Northern Hemisphere," she said.

"The Southern Hemisphere is a vast oceanic region that is influenced by ocean circulation features such as El Niño. Our study showed that these internal climate cycles may have played a role in influencing regional climate compared to the land-dominated Northern Hemisphere, where external changes in volcanic and solar variations have a more direct influence.

"But despite the two hemispheres behaving differently over the past 1000 years, what is consistent is the recent warming in the last 40 years.

"This study provided an opportunity to refine regional climate model predictions in the Southern Hemisphere for countries like Australia and South America by extending our understanding of natural temperature variations recorded since 1850 back over the past 1000 years," she said.

The study involved the coordination of an international scientific team with expertise in past climate information from tree-rings, lake sediments, corals, ice cores and climate modelling.

Scientists compiled climate data from hundreds of different locations and used a range of methods to estimate Southern Hemisphere temperatures over the past 1000 years.

In 99.7 percent of the results, the warmest decade of the millennium occurred after 1970.

And surprisingly, only twice over the entire past millennium have both hemispheres simultaneously shown extreme temperatures.

One of these occasions was a global cold period in the 17th century; the other was the current warming phase.

Lead author Dr Raphael Neukom from Switzerland said the study showed the 'Medieval Warm Period', as identified in some European chronicles, was a regional phenomenon.

"During the same period, temperatures in the Southern Hemisphere were only average. Our study revealed it was not a common climate event that many people have previously assumed," he said.

The study showed that regional differences such as these were larger than previously thought.

More information: Inter-hemispheric temperature variability over the past millennium, *Nature Climate Change* (2014) DOI: 10.1038/nclimate2174

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