

Nullarbor rocks reveal Australia's transformation from lush to dust

April 18 2023



Drone image of the Bunda Cliffs, where the Nullarbor Plain meets the Great Australian Bight. Layering in the cliffs represent different limestone units. Credit: Dr Matej Lipar.

Curtin researchers have discovered how long ago the Australian

Nullarbor plain dried out, with a new approach shedding light on how ancient climate change altered some of the driest regions of our planet.

Iron-rich layers formed in ancient sediments were used to narrow down when an area dried out in response to changes in [climate](#), such as the dramatic decline of groundwater in southern Australia.

These "relics of drying" suggest the Nullarbor drastically shifted to [dry conditions](#) between 2.4 and 2.7 million years ago, uncovering how these [environmental changes](#) were key in shaping Australia's diverse flora and fauna.

Lead author Dr. Maximilian Dröllner, from the Timescales of Mineral Systems Group in Curtin's School of Earth and Planetary Sciences, said defining the timing of climate change in ancient landscapes had proved challenging for geoscientists around the world.

"Almost half of the Earth's land surfaces are considered drylands, and they host about three billion people," Dr. Dröllner said.

"Changes to these arid areas can impact both our society and regional biodiversity in profound ways and aridification has been instrumental in shaping the landscapes and ecosystems we see today."

Determining when [climate events](#) occurred in arid areas has been a difficult task for geoscientists, with researchers relying on indirect observations, such as [marine sediments](#) in neighboring areas.

Co-author Associate Professor Milo Barham, also from Curtin's Timescales of Mineral Systems Group, said directly measuring products of the drying of landscapes can provide a much clearer timeframe.

"The amount of helium trapped in these iron-rich horizons can be used

to determine when they were formed," Associate Professor Barham said.

"Exposing these 'relics' of drying to a tiny laser releases helium, which we can measure to constrain the timing of these dramatic environmental responses to Earth's climate history."

Determining when these events occurred can help explain how they impacted the biodiversity of the area and, particularly in the case of southern Australia, provides a timeframe for the evolution of several native [species](#).

"The drying of Australia's interior separated the common ancestors of many species that once roamed freely across Australia," Dr. Dröllner said.

"This separation led to the independent evolution of these isolated populations on the east and west coasts, eventually resulting in [distinct species](#) or sister species."

"Today we observe many examples of sister species of birds, insects, and plants that have common ancestors but now live thousands of kilometers apart, separated by environmental barriers created through ancient climate change."

Published in *Geophysical Research Letters*, the research is titled "Directly dating Plio-Pleistocene climate change in the terrestrial record."

More information: Maximilian Dröllner et al, Directly Dating Plio-Pleistocene Climate Change in the Terrestrial Record, *Geophysical Research Letters* (2023). [DOI: 10.1029/2023GL102928](https://doi.org/10.1029/2023GL102928)

Provided by Curtin University

Citation: Nullarbor rocks reveal Australia's transformation from lush to dust (2023, April 18)
retrieved 8 May 2024 from <https://phys.org/news/2023-04-nullarbor-reveal-australia-lush.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.