IWRSP

The University of Texas at San Antonio
UTSA Earth and Planetary Sciences
College of Sciences

Seminar Presentation by:
Dr. Benjamin Johnson

PhD, Department of Geological and Atmospheric Sciences, Iowa State University
on
Friday, September 22, 2023
4:00 P.M.

Continental crust may have emerged in two steps

Biography

Ben is a geologist and geochemist with broad interests that span Earth History and Earth System Science. He uses a variety of rock archives, including chemical sediments, glacial tills, and igneous rocks as records of the interactions between life, the oceans, the atmosphere, and the solid Earth over deep time. He uses field work, analytical and isotope geochemistry, and numerical modeling to investigate deep time questions about Earth history. He is also interested in astrobiology and planetary science!

Link to access meeting via Zoom:

https://utsa.zoom.us/j/94322769921?pwd=VUdRQytucjV3YWJhcGFZdEdTR0NVQT09

Meeting ID: 943 2276 9921
Passcode: 96682775

One tap mobile
+13462487799,,94322769921#,,,,*96682775# US (Houston)
+17193594580,,94322769921#,,,,*96682775# US

Abstract

The timing of widespread continental emergence is poorly constrained, with published estimates between 3.5 to 0.7 Ga. Establishing the timing of widespread emergence is critical in understanding the interconnected history of Earth's oceans, geosphere, and biosphere. A potential tool that can constrain the timing of continental emergence is the oxygen isotope composition of seawater (OISW), which on long timescales reflects the balance of water-rock reactions during hydrothermal alteration of ocean crust and continental weathering. In this study, we built on previous work using sections of hydrothermally altered crust as a record of OISW to suggest OISW decreased in two steps between 3.0 to 1.5 Ga from 3.5‰ to 1‰ and then 1‰ to -1‰. The timing of these steps is coincident with periods of continental crust formation, observed in zircon ages, suggesting perhaps that onset of modern-style plate tectonics and supercontinent cycles drove emergence of continental crust.