

# Study suggests ocean was cooler than others have suggested during time life began on Earth

February 29 2016, by Bob Yirka



Map of South Africa. The Barberton greenstone belt shown in red. Credit: Wikipedia

A pair of researchers, one with Nelson Mandela Metropolitan University in South Africa and the other with the University of Bergen in Norway, has conducted a study of rocks in South Africa, and has concluded that the ocean was not as cold as other studies have shown during the time

period when life is believed to have first appeared on Earth. In their paper published in the journal *Sciences Advances*, Maarten de Wit and Harald Furnes describe their research results and why they now believe that our planet may have existed in the Goldilocks Zone for the entire time that life has existed on our planet.

Prior studies have been done on some particular rocks found in South Africa, important because they have been dated back approximately 3.5 billion years—back to approximately the same time period that scientists believe life first got its start on planet Earth. Those earlier studies have shown that the rocks actually resided at the bottom of the ocean during that time period, and that the ocean was approximately 55 to 85 degrees Celsius. In this new study, the research pair suggest that estimate was in error because it did not take into account the possibility that the rocks were near [hydrothermal vents](#), where the water is always warmer than the rest of the ocean.

To get a better idea of the true early water temperature, the researchers studied other nearby rocks of the same age that had been formed from ocean sediments, which meant they could not have resided near a vent. Those rocks, the team reports, contained gypsum, which in modern times grows only in cold deep sea water. Also, they noted that tiny grains of iron present in the rock at the time of its formation revealed that it had come about at low latitudes, very near the equator. Taken together, the evidence suggests, the researchers claim, that it was likely both the oceans and atmosphere were similar to conditions today, and that suggests that our planet may have resided in the Goldilocks zone (not too hot or too cold to support life) for the entire duration of the existence of life on Earth. They further suggest that their findings will lay to rest the common assumption that the only possibility of life coming to exist on Earth occurred during a time when the oceans were much warmer than today.

**More information:** M. J. de Wit et al, 3.5-Ga hydrothermal fields and diamictites in the Barberton Greenstone Belt—Paleoarchean crust in cold environments, *Science Advances* (2016). [DOI: 10.1126/sciadv.1500368](https://doi.org/10.1126/sciadv.1500368)

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