

Calibration of the Li/Mg proxy for sea water temperature

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Recent IPCC reports underline the challenge of reducing errors in palaeoclimate reconstructions to better constrain climate projections. Seawater temperature reconstructions based on existing geochemical proxies from biogenic carbonates (e.g. Sr/Ca, Mg/Ca, U/Ca, $\delta^{18}\text{O}$, and clumped isotopes in corals and foraminifera) suffer to varying degrees from the effects of the organism's physiology (commonly known as "vital effects"), which can complicate the interpretation of the geochemical signal. According to recent studies [1, 2], a new promising temperature proxy, the Li/Mg ratio in scleractinian corals, does not seem to be influenced by vital effects and so have a negligible impact on palaeoseawater temperature reconstructions. These characteristics of the Li/Mg proxy thus provide greater accuracy and precision for calculating temperatures from coral records.

Here we investigate in more detail the Li/Mg-temperature proxy and the potential role of coral microstructures in modifying this ratio. We will present new data from several live-caught and cultured coral species covering a large temperature range (from 0 to 28°C) from warm shallow-water tropical environments to the cold deep-waters at high latitudes.

[1] Hathorne *et al.* (2013), *Paleoceanography* **28**, 143-152 [2] Montagna *et al.* (2014), *Geochimica et Cosmochimica acta* **132**, 288-310