

Reconstructing the variability of the SE Pacific Oxygen Minimum Zone using geochemical proxies in benthic foraminifera

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During the past decades, the subsurface waters of the tropical and subtropical Atlantic, Pacific and Indian oceans have experienced decreasing oxygen levels resulting in expansions of the regional Oxygen Minimum Zones (OMZ). These effects have implications for the biogeochemical cycling in the ocean and for various marine ecosystems. They are assumed to be consequences of anthropogenic climate change during the last two centuries.

Past variabilities in the expansion of OMZs are recorded in sedimentary records worldwide. These records correspond to various time scales and reflect various magnitudes of oxygenation changes, offering a key to understand the mechanisms and consequences of decreasing oxygen contents in the sub-tropical ocean's subsurface waters.

A natural laboratory for understanding the development and the effects of past variabilities of the OMZ is the SE Pacific that hosts one of the volumetrically most important OMZs in the world ocean. In order to investigate which proxies can serve as suitable tools for reconstructing the SE Pacific OMZ expansion/compression in the past, we present results of a calibration of geochemical proxies in benthic foraminifera (stable isotopes, I/Ca, Mg/Ca, Cd/Ca, B/Ca) obtained from surface sediments taken along the Chilean margin.