Sedimentary redox-sensitive trace metals reveal large changes in deglacial ocean (de)oxygenation along the southern Chilean margin

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The ocean oxygenation state reflects a complex interplay between oxygen supply and demand, and is controlled by three main factors: while O_2 solubility plays an important role in surface waters, the O_2 concentration of the ocean interior is mainly determined by isopycnal downward transport of oxygenated water masses and by O_2 consumption due to bacterially-mediated respiration and remineralization of sinking organic matter [1].

A global compilation of marine sediment proxy records has shown that during the last deglaciation the upper ocean became generally more deoxygenated, whereas deep ocean O_2 concentrations tended to increase [2]. While the compiled data show a strong spatial homogeneity, they also highlight a different temporal evolution between both hemispheres. During the transition from the LGM to HS1 O_2 concentrations decreased in the upper 800 m of the eastern tropical Pacific and the Chilean Coast. Subsequently, the transition from HS1 to the B/A saw an extremely widespread decrease in oxygenation throughout the northern Indo-Pacific.

Here, we present new records of redox-sensitive trace metals, reflecting changes in oxygenation of intermediate to deep water masses (AAIW and PCW) in the course of the last deglaciation, from three core sites located on the Chilean margin (46°S, 1536 m below sea level; 46°S, 2524 m; 52°S, 1032 m). These new results complement previously published observations [3, 4] and help better appraise sensitivities and point towards dominant mechanisms of change modulated by Southern Ocean circulation and nutrient dynamics.

[1| Jaccard *et al*. (2014), *Oceanography* **27**, 26–35. [2] Jaccard & Galbraith (2012), *Nature Geoscience* **5**, 151-156. [3] Siani *et al*. (2013), *Nat. Commun.* **4**, 2758. [4] Muratli *et al*. (2010), *Nature Geoscience* **3**, 23-26.