

Continental shelf sediments as a source of bio-essential iron and manganese in Prydz Bay (East Antarctica)

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Polar regions are rapidly changing due to human-induced climate change. This may change the availability of (micro) nutrients for oceanic primary productivity, and thereby CO₂ uptake from the atmosphere. The dynamics of the trace metals iron (Fe) and manganese (Mn) in the Southern Ocean are of specific interest because their availability limits primary productivity. Continental shelf sediments are a potential source of Fe and Mn but their role as a source of Fe and Mn in the waters around Antarctica is, however, largely unknown.

Here, we present geochemical porewater and sediment profiles for 8 sites in Prydz Bay (East-Antarctica), which we use to characterize sedimentary Fe and Mn dynamics. Prydz Bay is located close to the Amery Ice Shelf and is the third most productive bay along the coast of Antarctica. We show that Fe and Mn oxide reduction coupled to organic matter degradation occurs at all of our study sites. Sediment Mn oxide contents are very low, however. There is limited or no release of Fe or Mn to the water column. While climatic changes have not yet greatly impacted the region, this is expected to change in future. In our presentation, we will discuss the potential consequences for the benthic release of Fe and Mn.