

Leaf wax *n*-alkane concentrations and stable isotope composition in dust – A new dust proxy for the South Pacific

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Abstract.

The Southern Ocean plays a major role in regulating carbon dioxide in Earth's atmosphere. Various physical and biological processes in the Southern Ocean are thought to work in tandem to drive atmospheric CO₂ changes on glacial/interglacial timescales. One of the hypothesized processes is an increase in the efficiency of the biological pump, likely fueled by enhanced iron input during glacial times. Dust is the primary carrier of iron to the ocean and it is well documented that glacial periods in Earth's history have been far dustier than warmer periods (Petit et al., 1999; Winckler et al., 2008). A recent study (Martínez-García et al., 2009) found that natural iron fertilization and export production increased in the Sub-Antarctic Atlantic Ocean during ice ages over the past 1.1 million years. However, in the Pacific, the largest Southern Ocean sector, reliable sediment records are sparse. A collaboration with researchers at the Alfred Wegner Institute, Germany, who recently retrieved sediment cores from the South Pacific, provides the first possibility to close this gap in our understanding of Southern Ocean processes.