

Impact of climate and natural iron fertilization on siliceous productivity off Kerguelen Archipelago, Southern Ocean, over the last 40 000 years

*Matthieu Civel⁵, Xavier Crosta¹, Giuseppe Cortese², Elisabeth Michel³, Alain Mazaud³, Samuel Jaccard⁴, Lena Thöle⁴, Minoru Ikehara⁵

1. UMR 5805 CNRS EPOC, Université de Bordeaux, France, 2. GNS Science, Lower Hutt, New Zealand, 3. LSCE-IPSL, CEA-CNRS-UVSQ, 91198 Gif-sur-Yvette, France, 4. Institute of Geological Sciences & Oeschger Centre for Climate Change Research, University of Bern, Switzerland, 5. Center for Advanced Marine Core Research, Kochi University, Japan

The Southern Ocean (SO) is a place of primordial importance to the understanding of global ocean circulation as it connects the Atlantic, the Pacific and the Indian oceans and thus actively participates in Atlantic Meridional Overturning Circulation (AMOC). Climate processes and variations in the Indian sector of the SO are not as well understood as processes in the Atlantic sector. In this study, sea surface temperatures (SST) are used to better constrain climate and ocean circulation variations in the Indian sector of the SO from Marine Isotopic Stage 3 (MIS 3) to present. We present new high-resolution SST datasets for the past 41kyrs, reconstructed with two statistical approaches Imbrie and Kipp Method (IKM) and Modern Analog Technique (MAT) applied to radiolarian census data. Different signals for surface and subsurface water masses suggest that surface water responded mainly to local processes whereas subsurface waters show a response driven by hemispherical and global processes. Similarly we show that radiolarian and diatom productivity behave differently over the last 41kyrs, probably due to specific oceanic conditions in this zone.

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