



Inter-annual variability of biogenic and mass fluxes in the northern Joides Basin (Ross Sea - Antarctica)

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The Southern Ocean plays an important role in world climate as it is a key area for the formation of oceanic bottom waters, and it is an important region for air-sea CO₂ exchange, accounting for 20 to 25 % of the annual oceanic uptake of CO₂. In this contest, biogeochemical changes that occur in the water column play an important role. In this study we analyze the biogeochemical composition of sediment trap samples collected in the Ross Sea continental shelf. The samples have been collected in the site B, located at 74°00.178'S and 175°05.864'E in the northern Joides Basin, during 1999 and 2008. This area is characterized by high biological productivity during spring, algal blooms in summer and high spatial and temporal variability of fluxes. A series of biogeochemical analyzes were carried out on these samples including organic carbon, nitrogen, bio-silica and total mass flux. In this area, generally, the maximum flux to the seabed occurs at least two months after the peak of productivity, which is usually in December or early in the year. The biomass produced is retained at the upper water column for a longer time respect to other ecosystems with high productivity due to the difference between the community development of phytoplankton and the growth of zooplankton.

Our data document that the period of highest mass and biogenic flows changes over time occurring in January during 1995, in February-March during 1999, and in March-April during 2008.

The integration between biogeochemical results and environmental forcings of the study area suggests that the delay can be related to the extent and concentration of seasonal ice. In addition, changes related to the physicochemical parameters of the water column (such as temperature and salinity) and nutrients input could have caused late bloom of diatoms and physiological variations in phytoplankton communities.