



Dissolved iron in the vicinity of the Crozet Islands, Southern Ocean

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In order to improve our understanding on the natural iron fertilisation processes and sources that can alleviate the HNLC conditions normally associated with the Southern Ocean, the biogeochemical characteristics of the water masses located in the North and South wake of the Crozet Islands (46°26'S - 52°18'E) were studied during CrozEx, a large multidisciplinary study performed between November 2004 and January 2005. The annual phytoplankton bloom occurring north of the Crozet Plateau provides a good opportunity to study those phenomena. Therefore, measurements of total dissolved iron (DFe, 0.2 μ m fraction) have been undertaken on collected seawater samples from around the islands by flow injection analysis with DPD catalytic spectrophotometric detection. Vertical profiles from the South to the North of the plateau showed evidence of a range of processes influencing the iron distributions. The main result is the enrichment of dissolved iron (> 2 nM) at close proximity to the islands, which suggests that the plateau and the associated sediments are a source of iron. Waters further north also appear to be affected by this input of coastal and shelf origin, although dissolved iron concentrations decrease as a function of distance to the north of the plateau with a gradient of 0.07 nM.km⁻¹. Combined with short lived Ra isotopes profiles, it was possible to provide an estimate of a horizontal flux of Fe. The mechanisms governing the bioavailability of the dissolved iron supply remain currently unresolved, however, the data presented here is one of the few sets available, including first deep water measurements, which strongly suggests that the enhanced chlorophyll associated with these Sub-Antarctic islands can be linked to an island dissolved iron supply.