Dissolved Aluminium and Manganese as source tracers for Iron in Polar Oceans

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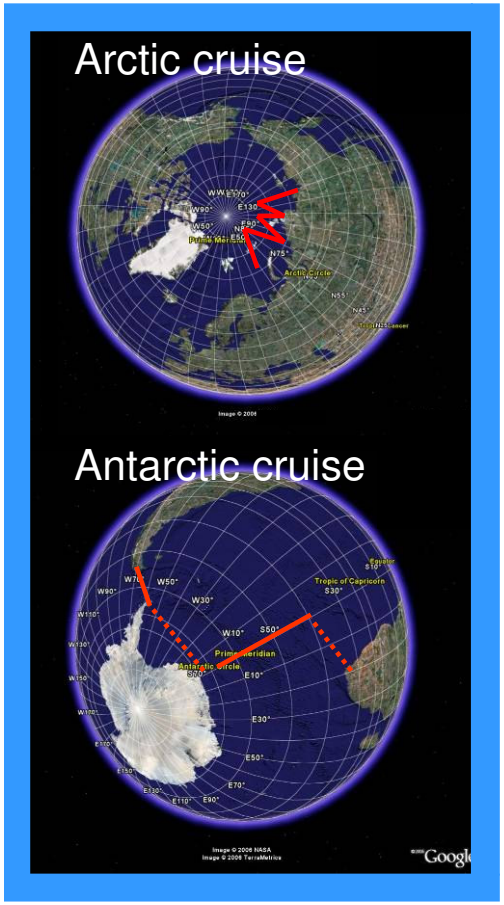


What: Study of Aluminium (Al) and Manganese (Mn) as suitable tracers for input of iron (Fe) into the polar oceans

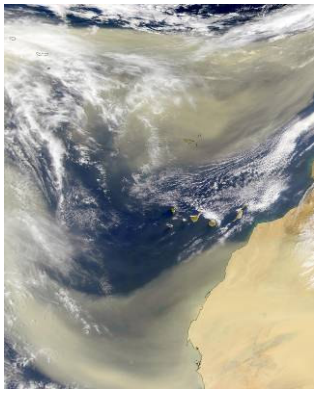
Why: Assess the iron input either from above by aeolian dust, or from below by reductive dissolution from bottom sediments

Where: 1. Atlantic Pelagia test cruise near Portugal April 2007
2. Arctic Polarstern Cruise ARKXXII/2 Aug-Sept 2007
3. Antarctic Polarstern Cruise ANT XXIV/3 Jan-March 2008

How: Accurate measurements of dissolved Fe, Al and Mn in the entire water column (~ 5km) with flow injection analysis.
Determination of the fractions Fe, Al and Mn in aeolian dust.
Measurements of natural isotopes ^{228}Ra and ^{227}Ac.

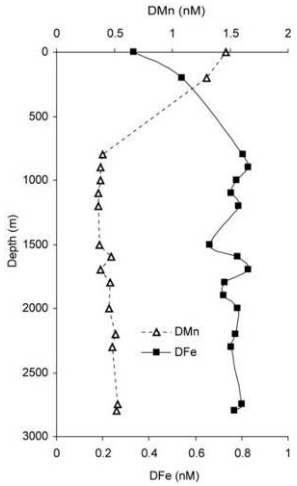
Details

The relative importance of Fe supply by aeolian dust and reductive dissolution from the underlying sediments in the Polar Oceans will be assessed. Al will be used as a tracer for dust input, and Mn will be used as a tracer for dissolution from the sediments.



Aeolian dust plume from the African continent above the Atlantic Ocean

The natural isotopes ^{228}Ra and ^{227}Ac will be measured as Fe tracers from respectively the continental slope or deep sea. A better understanding of the Fe supply to these regions will aid in the understanding of global carbon and nutrient cycles. Especially the global carbon cycle is most interesting due to its relevance with global change.



Mn and Fe profiles in the Bay of Biscay (from Laes et al., 2006 in press, Biogeosciences)