

US GEOTRACES GP17-ANT Section: Shipboard Dissolved Al, Fe and Mn

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Research goals and relevance to cruise objectives: We propose to determine the GEOTRACES key parameters dissolved Al, Mn and Fe in water-column and surface-water samples using shipboard flow injection analysis (FIA) during the GP17-ANT cruise. These measurements will be used to test a number of hypotheses concerning the composition and importance of various iron sources in the Amundsen Sea, as well as the transport and removal of iron in the study region, in combination with other tracers that we anticipate will be measured as part of this cruise (e.g., noble gases, oxygen isotopes, Th-234). The proposed measurements potentially allow the identification of unanticipated features and processes (e.g., subglacial meltwater inputs) during the cruise in semi-real time, thus guiding and informing the cruise track and sampling plan, as proved crucial for defining the extent of the EPR hydrothermal plume sampled on the GP16 cruise. The measurements will also provide a check on potential contamination during collection and processing of water-column samples (Al, Fe). For these purposes, we will make our preliminary shipboard data immediately available to the other cruise scientists. The shipboard analyses will use FIA methods that are well established in our laboratories. In addition to the shipboard analyses, we will perform additional post-cruise analyses using FIA and ICP-MS to complete and verify the accuracy of shipboard analyses.

Sample requirements: We will require three 125 mL samples of 0.2 μm -filtered seawater from the trace-metal rosette Go-Flo samplers, as well as selected filtered surface water samples from the towfish or small boat sampling system.

Berth requirements: We request 2 cruise berths to accomplish this work.