

Sampling and analysis of sea ice, glacier ice and snow for TEIs (Al, Mn, Fe, Ni, Cu, Zn, Pb, particulate Fe stable isotopes and REEs)

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We are interested in participating in the GP17-ANT leg to:

- 1) Determine the content and size partitioning of TE in Antarctic sea ice, snow and glacier ice to provide end-member values and aid to characterize the influence of the cryosphere to the input of TE in this region
- 2) The timing of the GP17-ANT cruise is towards the end of the sea ice yearly cycle, knowing the content of REEs and stable iron isotopes in the labile and refractory fractions of sea ice and glacial particles will aid in quantifying sources that affect the gradients in TEIs across the waters surveyed during this leg.
- 3) Measure auxiliary parameters such as ice thickness, ice temperature and salinity profiles, ice brine volume fraction, snow thickness, snow temperature profile, to aid in the interpretation of sea ice and snow TEI data

Our proposed work will provide concurrent sea ice, snow, and glacier ice measurements of TEIs. In addition, we propose to provide community surface water samples from a small boat or the ice as done during GN-01.

Sea ice samples will be collected with the custom-made TM-clean ice corer that was used successfully during GN01. Under the ice water profiles (down to 20 m) and snow will be collected as done during the GN01 Arctic cruise. Glacier ice will be collected opportunistically from a small boat or passenger basket. We will be able to collect additional cores for interested PIs.

One-two berths will be requested for the collection and processing of ice, snow, and water under ice samples. Cruise work includes sample collection (ice, snow, water), *in situ* auxiliary measurements, on-board processing (melting, filtering, subsampling), coordinating with water sampling teams.

Ship requirements

- a) Onboard temperature controlled lab
- b) Access to ice floes
Zodiac transportation (optional if adequate access to ice from ship)