

Pb and Pb Isotopes Arctic Letter of Intent
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Robert Rember and Ed Boyle are interested in submitting a science proposal to share the workload of measuring Pb and Pb isotopes along the US GEOTRACES Arctic Section. We anticipate collecting about 700 samples, one third of which would be analyzed for Pb isotopes. We aim to divide the workload evenly, although there may be some specialization (i.e., one lab to do more Pb concentration measurements, the other to do more Pb isotope measurements, with an equivalency of one Pb isotope measurement = three Pb concentration measurements).

Scientific Objective:

- 1) Determine the concentrations and isotopic ratios of Pb along the U.S. GEOTRACES Arctic section. Very few published dissolved Pb profiles exist and no profiles of isotopic Pb exist in the Arctic at this time. This project would comprise some of the first Pb data for seawater in most of the Arctic Basins.
- 2) Assess the contributions of atmospheric Pb to the snowpack/ice. The air masses passing over the Arctic are influenced by many different continental sources. The isotopic ratios of the upper water column should be primarily influenced by melted snow/ice and potentially from river runoff in some locations.
- 3) Assess the potential for Pb isotopes to 'age date' the Atlantic Water entering the Makarov and/or Canada Basin. There are estimates of the amount of time required for Atlantic water entering Fram Strait to reach the Canada Basin. Using Pb isotope data from the North Atlantic, we may be able to provide a better idea of these transit times.

Sample Needs:

1000 ml for dissolved and isotopic Pb samples from trace metal clean GEOTRACES bottles at all depths and stations.
Some samples of aerosols and particulate matter.

Anticipated Scientific Collaborators:

PI(s) studying aerosols, precipitation (snow) and sea ice; transient tracers

Berths and Logistics:

Sample collection would resemble samples collected during the Atlantic and Pacific transects. Between us, we are willing to send one trace metal savvy individual to serve in the GEOTRACES trace element sampling team.