

Subproject: Mercury speciation and exchange between the atmosphere and the Arctic Ocean (Canadian Arctic GEOTRACES)

Actual field dates: July 10 – November 1, 2015

Field site: Labrador Sea, Hudson Bay, Baffin Bay, Canadian Arctic Archipelago, Beaufort Sea, and Canada Basin

Number of man-days in the field: 205

Summary:

To achieve our objectives, we sampled a large region of the Canadian Arctic Ocean. Atmospheric mercury species were monitored throughout the ship cruise track using an automated Tekran atmospheric mercury speciation system. Seawater samples for total and methylated mercury were collected at high resolutions from locations with different sea ice and hydrographical conditions. In addition, we collected water samples for inter-calibration studies with other US and German collaborators, which will allow us to compare and improve the current methodology for measuring seawater mercury. Most of the measurements for total mercury and methyl mercury were done at the Portable In-situ Laboratory for Mercury Speciation (PILMS) onboard the ship. Additional analyses will be done at the Ultra-Clean Trace Elements Laboratory in Winnipeg. To study the mechanism of Hg methylation in seawater, we conducted incubation experiments using a stable isotope labeling method. The data from this field season will help us understand more about the mercury biogeochemical cycling in the Arctic.

Photos:

Fig. 1: Location maps showing sampling stations for seawater mercury species during Leg 2 -July 10-Aug 20 - (A) and Leg3 - Aug 21-Oct 2- (B).

Credit: Kang Wang

Fig.2: Kang Wang fills bottles for mercury methylation/demethylation rate measurements in the Portable In-situ Laboratory for Metal Speciation space on the Amundsen. Credit: Kang Wang

Fig.3: Ashley Elliot and Priyanka Chandan (University of Toronto) sample ice for mercury in the Beaufort Sea. Credit: Lauren Candlish

Participants:

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Acknowledgements:

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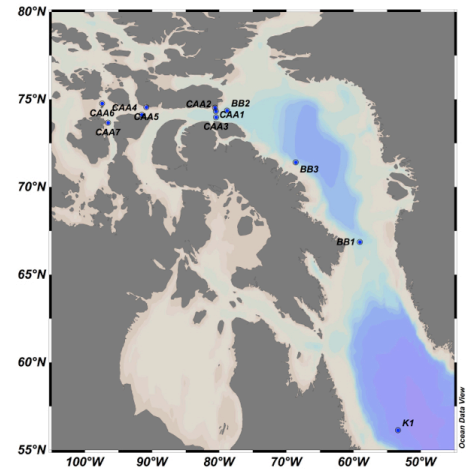


Figure 1 - A

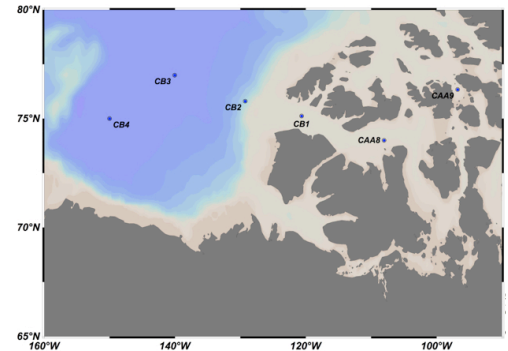


Figure 1 - B



Figure 2



Figure 3