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In the framework of GEOVIDE-GEOTRACES GA01 cruise (spring 2014), Cossa and co-workers (see reference below) measured the first high-resolution mercury (Hg) distribution pattern along a transect from Greenland to Labrador coasts. An interesting feature is the observation of Hg enrichment originating from fluvial sources in the Canadian Arctic Archipelago waters. This excess Hg is transferred southward, in surface waters with the Labrador Current, and at depth with the lower limb of the Atlantic Meridional Overturning Circulation via the Deep Western Boundary Current. The authors underline that global warming could accelerate permafrost thawing in a near future, increasing the Hg discharge by the Arctic rivers.



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Abstract

The Labrador Sea links the Arctic and North Atlantic oceans and constitutes one of the main entrances of atmospheric inputs into the Ocean's interior. We report here the first high-resolution Hg distribution pattern along a transect from Greenland to Labrador coasts sampled after the 2014 winter convection. Total Hg concentrations in unfiltered (HgTUNF) samples ranged from 0.25 pmol L⁻¹ to 0.67 pmol L⁻¹ averaging 0.44 ± 0.10 pmol L⁻¹ (n = 113, 1?). Concentrations in filtered samples (HgTF, 0.5 pmol L⁻¹) in the Northeast Atlantic Deep Waters. HgTF correlates with apparent oxygen utilization implying that atmospheric deposition, biological uptake, and microbial respiration control the Hg distribution in the Labrador Sea. Subtracting the amount of Hg released during organic matter remineralization allows us to identify a Hg and organic matter enriched fraction, which originates from fluvial sources in the Canadian Arctic Archipelago waters. This fraction is transferred southward, in surface waters with the Labrador Current, and at depth with the lower limb of the Atlantic Meridional Overturning Circulation. Climate warming, which will increase the mobilization of Hg from thawing permafrost, would consequently increase the Arctic export of Hg initially associated with organic matter.

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