Goldschmidt 2026 Abstract
https://doi.org/10.46427/gold2026.36656

Mercury Mass Balances, Transformations and Bioaccumulation in Two West Greenland Fjords

CARL LAMBORG[1], JON R HAWKINGS[2], LORENZ MEIRE[3], AMINA NIKOL YOUSSEF[4], NETTIE CALVIN[1], XINYUN CUI[1], JOHANNES WEST[5], MARISSA DESPINS[1], PHOEBE LAM[1], EMMA M KOCIK[4], IRIS KUBLER-DUDGEON[5], KRISTINE C PRELICH[6], MARION MCKENZIE[7], LOIC PIRET[4] AND AMINA T. SCHARTUP[5]

[1]University of California, Santa Cruz
[2]The Arctic University of Norway
[3]NIOZ
[4]University of Pennsylvania
[5]Scripps Institution of Oceanography
[6]University of Connecticut
[7]Colorado School of Mines

Mercury is a toxic metal found in trace amounts in Arctic ecosystems. This concentration is nonetheless high enough to drive bioaccumulation to hazardous levels in aquatic foodwebs and particularly so in the Arctic. This is of particular concern for Arctic peoples who traditionally depend on marine resources and are therefore especially exposed to mercury.

As part of research designed to understand the sources and cycling of mercury in the Arctic, we measured mercury concentrations, speciation and rates of transformation in two fjord systems of West Greenland (Kangerlussuaq and Tunulliarfik). These are systems impacted by land- and/or marine-terminating glaciers that supply meltwater at accelerating rates. We found evidence of important inputs from melting permafrost and glaciers, especially in the Kangerlussuaq system which has more extensive permafrost. This system was also a net source of mercury and methylmercury to the coastal ocean, whereas Tunulliarfik was closer to being in balance. Mercury transformation rates were low compared to mid-latitude systems and plankton were not particularly elevated compared to other marine systems. Thus, while the system receives fairly large Hg fluxes, the biota do not appear to be proportionally affected.