

EGU22-13320

<https://doi.org/10.5194/egusphere-egu22-13320>

EGU General Assembly 2022

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Co-located ice core and sediment core records reveal climate-warming induced acceleration of mercury inputs to Lake Hazen, Nunavut, Canada

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Mercury (Hg) is a globally dispersed contaminant that can bioaccumulate and biomagnify in food-webs. This research uses a unique combination of measurements in an ice core and a sediment core collected within the same watershed (Lake Hazen, Nunavut, Canada) to determine how the relative importance of Hg inputs from atmospheric and terrestrial sources has changed over the last century. Hg accumulation in Lake Hazen sediment began increasing dramatically in the mid-1990s, exhibiting a decoupling from atmospheric sources (as estimated from the ice core record), due to the increased importance of remobilized terrestrial Hg inputs to Lake Hazen. Increasing glacier melt and permafrost thaw slumping have increased the delivery of catchment Hg, via glacial rivers, into Lake Hazen. These results show that climate change is likely to slow the recovery of glacierized Arctic watersheds from Hg contamination, countering the anticipated benefit from recent international efforts to reduce anthropogenic Hg emissions.