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SESSION TRACK: Integrated Environmental Assessment and Management

REQUESTED SESSION: Integrated Understanding of Biogeochemical Cycling of Mercury around Ocean Environmen... [Noriyuki Suzuki]

REVIEWER COMMENTS:

Noriyuki Suzuki: [No Comments]

Kohji Marumoto: [No Comments]

REVIEWER RECOMMENDATIONS:

Noriyuki Suzuki: [No Recommendation]

Kohji Marumoto: [No Recommendation]

REQUESTED PRESENTATION TYPE: Platform

Student Presentation Award:

TITLE: Mass budgets of methylmercury in Kongs fjorden, Svalbard

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AGREE TO BE RECORDED: TRUE

ABSTRACT BODY: Methylmercury (MeHg) is a neurotoxin that bioaccumulates in aquatic food chains and human can be exposed to MeHg through fish consumption. While MeHg concentrations in Arctic seawater are relatively higher than lower latitudes, major sources of MeHg in arctic seawater remain uncertain. In the current study, we calculated mass budgets for MeHg in the Kongs fjorden, Svalbard, based on reference values and measurement data obtained from the 2016 and 2017 Svalbard cruise. We found out that significant MeHg production occurs in the water column through in-situ methylation, and input from sediment diffusion is the second largest source. The MeHg input from external sources, such as river and glacier, was relatively low. The result of mass flux estimation agreed well to the typical distribution pattern of MeHg in this region, showing higher concentrations (0.07-0.17 pM) at surface 0-50 m and lower at deeper depths (0.06-0.13 pM, 100-250 m). We also found two components of fluorescent dissolved organic matter from the surface seawater using a PARAFAC (parallel factor analysis) model: component 1 is biological organic matter like amino acid (i.e., tyrosine or tryptophan) and component 2 is terrestrial humic matter. The MeHg concentration was revealed to be higher in the C1-dominant seawater and lower in the C2-dominant seawater. Currently, we are measuring methylation (K_m) and demethylation rate constants (K_d) of Kongs fjorden seawater to find out how K_m and K_d are associated with environmental variables such as PARAFAC components.

KEYWORDS: Metals