



## Mercury in the sediments of freshwater lakes in Ny-Ålesund, Arctic

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**Abstract** Mercury and its speciation in aquatic ecosystems have been assessed globally. Even though previous studies were limited to Arctic freshwater lakes, they are highly significant in the context of the changing climate. The present study is based on sediment samples collected from three Arctic freshwater lakes over a period of 4 years (2015–2018). The samples were analysed for total mercury (THg), methyl mercury (MHg), and various mercury fractions. The observed mean THg and MHg concentrations were 22.23 ng/g and 0.41 ng/g respectively; these values were comparable with those for other Arctic freshwater lakes. The mercury content significantly varied among the years as well as among the lakes. Changes in snowdrift and meltwater inputs, which are the major sources of water for the lakes, may have influenced the sediment mercury content along with geographical location and increased productivity. The results of MHg indicated the susceptibility of lake sediments to methylation. The major fractions observed

the elemental and water-soluble forms. These results indicate the availability of mercury for methylation. Hence, it is necessary to conduct more studies on the influence of climate change, mercury release through permafrost melting, and atmospheric deposition.

**Keywords** Pollution · Metal · Svalbard · Methylation · Fractionation

### Introduction

The pristine environment of the Arctic has served as a sink for various contaminants in the past (Bard 1999; Ariya et al. 2004; Dastoor and Durnford 2014; Moskovchenko et al. 2017). Metals like mercury, lead, and other organic contaminants have reached Arctic by long-range transport and have been deposited in the atmosphere (Chang and Schroeder 2000; Zaborka