
Anthropogenic particles in European Arctic marine environments: impacts from the world's northernmost settlement at 78° N

Carolin Philipp^{*†1}, France Collard², Beatrice Rosso^{3,4}, Giulia Vitale^{3,4}, Fabiana Corami^{3,4}, Katrine Husum², Geir Wing Gabrielsen⁵, and Ingeborg G. Hallanger²

¹Norwegian Polar Institute – Hjalmar Johansens gate 14, 9296 Tromsø - Norway, Norway

²Norwegian Polar Institute – Hjalmar Johansens gate 14, 9296 Tromsø - Norway, Norway

³University of Ca' Foscari [Venice, Italy] – Via Torino 155, 30172 Venezia Mestre, Italy

⁴Institute of Polar Sciences [Venezia-Mestre] – Università Ca' Foscari, Via Torino 155, 30172 Venezia-Mestre, Italy

⁵Norwegian Polar Institute – Hjalmar Johansens gate 14, 9296 Tromsø - Norway, Norway

Abstract

Microplastics (This study investigates water samples collected in the inner part of Isfjorden and Adventfjorden, located in western Svalbard, which is influenced by inflowing water masses from the Fram Strait in addition to local runoff from rivers and surrounding glaciers. The world's northernmost settlement, Longyearbyen, is also located here and has a non-treated wastewater outflow to Adventfjorden. The samples were collected on both sides of the opening of Adventfjorden. Two in the inflowing current and two in the outflowing current of the fjord. Replicate water samples were collected with a CTD cast equipped with Niskin bottles in June 2021. An already established oleo-extraction was applied to extract anthropogenic particles ($> 50 \mu\text{m}$) from the samples. The subsequent quantitative and qualitative analysis was conducted via Micro-FTIR. Results from the examination of the microplastics will be presented together with previous modelling experiments of fibre transport pathways from the wastewater outlet from Longyearbyen.

Keywords: microplastic, Arctic, μFTIR spectroscopy, oil extraction, Svalbard, sea water

*Speaker

†Corresponding author: carolin.philipp@npolar.no