

Occurrence, transport and exchange fluxes of emerging organic contaminants in the Arctic



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Geesthacht, 11 January 2019

WP 2: In-situ component for organic contaminants, mercury and other heavy metals

Task 2.4: Study of interactions between environmental spheres (atmosphere, hydrosphere, biosphere, cryosphere)

D2.4.1: Emerging organic contaminants in air from the Arctic

Document version number 1.0

Atmospheric long-range transport is a significant route for anthropogenic contaminants to reach the polar areas, which can adversely affect human health and the polar ecosystems. Besides, climate change may significantly affect the environmental fate of anthropogenic contaminants in the Polar environmental system and drive the interaction between environmental spheres (atmosphere, hydrosphere, biosphere, cryosphere).

This work is focused on studies of the temporal trends and exchange fluxes of emerging organic contaminants (EOCs), e.g. halogenated flame retardants (HFRs) endocrine disrupting chemicals (EDCs) and Per- and polyfluoroalkyl substances (PFASs) in the Arctic. Air, snow, water and biota samples are collected during the expedition cruises and at Arctic research stations from 2012-2019. The aims of the project are: (1) characterization of the concentrations of EOCs in the atmosphere, seawater, snow and biota in the central Arctic; (2) evaluation of the air–water and air-snow exchange process intervening in the transport of EOCs in the Arctic; (3) modeling the input of EOCs into the central Arctic via atmospheric dry and wet deposition. Data and feedback from this project may improve models to

predict the environmental progression and assess the effect of climate change on the long-range transport and the fate of the emerging organic contaminants in the Arctic ecosystem.

References

Xie, Z.; Wang, Z.; Mi, W.; Möller, A.; Wolschke, H.; Ebinghaus, R. (2015): Neutral Poly-/perfluoroalkyl Substances in Air and Snow from the Arctic. *Scientific Reports* 5:8912 .

Li, J., Xie, Z., Mi, W., Lai, S., Tian, C., Emeis, K., Ebinghaus, R. (2017): Organophosphate Esters in Air, Snow and Seawater in the North Atlantic and the Arctic. *Environmental Science and Technology*, 51, 6887-6896.