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Theme -Theme 1: Design, Optimization and Implementation of the Observing System

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Poster title (brief) Microplastics in marine sediments and benthic fauna: what do we know and what do we not know?

Abstract - text box

Up to 10% of global annual plastic production enters the Global Ocean yearly posing threats to marine biota and habitats, affecting economy and aesthetics. After entering marine environment, plastic items degrade into smaller particles (microplastics) that become bioavailable for wide range of marine organisms as a result of mechanical fragmentation and partial biodegradation. Microplastics have been globally identified in marine ecosystems and recognised as an emerging thread. However, environmental fate and eco-toxicological effects of microplastics remain debatable and largely unknown. It is often assumed, that microplastics accumulate in benthic ecosystems either in bottom sediments or in benthic organisms. Most of the studies looking on digested plastics by marine fauna would have found some, including those in deep-sea fauna and most remote marine ecosystems with limited anthropogenic impact, such as the East-Siberian Sea in the Russian Arctic. Limited experimental studies on fish and invertebrates reported complex physiological and biochemical responses to ingestion of contaminated microplastics including disruption of synthesis of endogenous hormones, inflammation reactions and others. In this review, we want to address methodological issues that benthic microplastic assessments are facing during different phase of research, including but not limited to (1) sampling techniques; target species; (2) quantitative assessment, units of measurement; (3) chemical identification of microplastics; (4) airborne contamination. We then suggest a protocol for benthic microplastic research based on limited existing guidelines with adaptations that we have developed over three years of data collection in the Russian Arctic.