
Marine litter accumulation patterns in the Russian part of the Barents Sea

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Abstract

A complex survey held in frames of the Arctic Floating University project in 2021 and 2022 in the Russian part of the Barents Sea and beyond showed in general a significant accumulation of plastic macrolitter on the coasts of Novaya Zemlya (Cape Zhelaniya and neighboring bays), with no propagation further to the Kara Sea. Comparison with previous studies shows that the overall amount of litter here is growing. The coasts of the Barents Sea side of the archipelago have an order of magnitude higher amount of litter as compared to the Kara Sea side with the maximum amounts of over 1000 items per 100 meter beach strip at Cape Zhelaniya and over 2600 fragments per 100 m at Murmants Bay. Litter composition (over 30 % - parts of fishing gear, over 50 % - bottles of various cosmetic products and non-food packaging) and labels on the litter fragments do not support the theory of plastic waste long transfer with currents from remote regions of North Atlantic as most of the identified litter is of Russian, Scandinavian and British origin, which says for local sources of marine litter - fishing, cargo and passenger vessels in the Barents and Norwegian Seas. Density of floating litter is growing too, 5 items per sq.km of water surface on average, and shows several accumulation spots near local convergence zones and along the heavily trafficked part of the North-East Passage (along the coast of the Novaya Zemlya), however, the composition of floating litter (plastic bags, plastic fragments) is not the same as on the nearby beaches, which points out the different source of this litter (more likely the passing ships). Surveys also showed the presence of plastic litter from mainly fishing industry even on the most remote and uninhabited islands of the Franz Jozef Land archipelago.

Keywords: marine macrolitter, Russian Arctic, Barents Sea, Novaya Zemlya, beach litter, accumulation spots

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