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# Anthropogenic heavy metals in the environment of Eurasian Arctic Nature Reserves

Anna Vinogradova, Yulia Ivanova, and Alexey Karpov

A.M.Obukhov Institute of Atmospheric Physics RAS, Russian Academy of Sciences, Moscow, Russian Federation (anvinograd@yandex.ru, +74959595076)

The Russian Arctic Nature Reserves are situated far from the main industrial regions. In spite of this, there are anthropogenic constituents (for example, heavy metals – HM) in the environmental objects (air, water, etc.) and in food chains (plants, birds, and so on).
We studied the long-range atmospheric transport of some heavy metals (such as nickel, copper, lead, arsenic, and so on) to four Nature Reserves situated near the shore of the Arctic Ocean – in the Deltas of the Pechora River (Nenets reserve), the Ob River (Gydansky reserve), the Lena River (Ust-Lensky reserve), and at Wrangel Island. The air mass trajectories to each reserve were calculated with the help of the site (www.arl.noaa.gov/ready) for each day of January, April, July, and October for the period of 2001-2010. Analyzing the spatial distributions of these trajectories we studied seasonal variations in air transport of pollution to different Russian Arctic points. Modeling the HM transport in the atmosphere was as in [1]. The main assumption is that HM are transported with submicron aerosol particles. The annual source emissions for the last decade are generalized from the data published by Roshydromet of Russia (http://www.nii-atmosphere.ru/files/PUBL/Eg_2008.doc).
The main important source-regions were found for each point. Mean anthropogenic HM concentrations in air and precipitations, as well as HM fluxes onto the surface were estimated at different arctic regions. The spatial distributions of so called “potential function of pollution” were calculated and presented on the maps. These results allow to analyze the role of a real pollution source or of a planned source for each reserve. So, the influence of northern oil and gas industry may be of great importance because of its proximity to the reserves under investigation.

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1. Vinogradova A.A. and Ponomareva T.Ya. Atmospheric Transport of Anthropogenic Impurities to the Russian Arctic (1986–2010) // Atmospheric and Oceanic Optics. 2012. V. 25. No. 6. P. 414-422. (Engl. Transl.)