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Assessment of heavy metal deposition from the atmosphere with precipitation in the Barents Sea region

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The data of precipitation sampling in the area of biologic station of Murmansk Marine Biological Institute from April 2001 till April 2002 were used to assess the intensity of priority heavy metal deposition from the atmosphere with precipitation in the Barents Sea Region.

The data on emissions from the enterprises of non-ferrous and mining industry, as well as energy enterprises, which are the main contributors of heavy metals into the atmosphere and located in the region, have been summarized. The analysis has showed that heaps of heavy metals, migrating in the atmosphere on a global scale, to a considerable degree are replenished in the Barents Sea region by **Ni, Cu, Zn, Cd, Pb, Cr** and **Hg**, which come from regional sources. This makes this group of metals priority pollutants for the region.

Heavy metal concentrations in monthly precipitation samples in the coastal zone of Kola Peninsula changed in a yearly cycle in the following ranges: **Pb -** 0,48-2,3 μg/dm^3; **Cd -** 0,022-0,093 μg/dm^3; **Cu -** 1,5-8,5 μg/dm^3; **Zn** 18,3-34,3 μg/dm^3; **Ni -** 0,34-1,5 μg/dm^3; **Cr -** 0,25-0,81 μg/dm^3; and **Hg -** 0,002-0,008 μg/dm^3.

During the whole yearly period **Cu** concentrations in precipitation were higher than in seawater. Such excess for **Pb, Cd, Ni** and **Hg** was intermittent. This shows that precipitation is the real pollution source for the Barents Sea water.

To assess the consequences of heavy metal transport into the marine environment from the atmosphere, specific wet deposition of heavy metals (per a unit of area) over monthly and yearly periods, the mass of heavy metals transported from the atmosphere

with precipitation onto the Barents Sea surface over the yearly period, and heavy metal content in seawater have been calculated.

The data obtained show that mass of heavy metals transported into the Barents Sea with precipitation over a yearly period is incomparable to heavy metal content in the Barents Sea water. Thus, in such geochemically active medium as seawater, in open areas of the Barents Sea, remote from the coast, heavy metal transport with precipitation does not cause any substantial change of the seawater composition.