



Lead Author e-mail: [mozolya@mail.ru](mailto:mozolya@mail.ru)

**Title:** *Abstract title Dynamics of hydrochemical conditions in the Kara Sea*

**Morozova Olga**<sup>1</sup>, Dobrotina Elena<sup>1</sup>, Onoshko Vladimir<sup>1</sup>, Vesman Anna<sup>1,2</sup>, Tarasenko Anastasiya<sup>1,2</sup>, Shumskaya Natalia<sup>1,2</sup>

<sup>1</sup>*Arctic and Antarctic Research Institute, Russia, St. Petersburg*

<sup>2</sup>*St. Petersburg State University, Russia, St. Petersburg*

### Abstract text

The high arctic marine ecosystems are sensitive to environmental changes. Recently while the sea ice extent is shrinking the anthropogenic load is getting higher that might considerably affect the hydrochemical conditions over the Siberian Arctic seas and change the food basis for life in the sea water.

The new outstanding data have been recently obtained during «Yamal-Arctic» expedition in August-September, 2012. Numerous samples of dissolved oxygen, inorganic phosphorus and silicates, and oil hydrocarbons in the Kara Sea were obtained. Spatial distribution of silicate in surface layer clearly shows the pattern of Ob' and Yenisei river plume spreading northeast to the direction of Severnaya Zemlya archipelago, while the central part of the Kara sea untypically does not contain any tracers of river water. For instance, according to the measurements in 2007-2008 the northern and central parts of the Kara Sea were occupied with fresh water enriched with nutrients. The oxygen saturation in September, 2012 was 97-99% in the riverine waters being reduced by oxidation of organic substance. For reference, the oxygen saturation in August, 2007 was about 96%. It implies that the Ob' and the Yenisei river run-off in 2012 is reduced in comparison with 2007.

The small deficiency of oxygen is observed in the surface layer of water in the Baidara Bay. The oxygen deficiency was 1-2 % that is not typical for this area and is likely caused by terrestrial household water. The average silicate and phosphate concentrations confirm this suggestion. The silicate concentrations in the surface layer were ~3,5-4,0  $\mu\text{mol/l}$  and ~0,22-0,35  $\mu\text{mol/l}$  for phosphates. The average silicate and phosphate concentrations in the central and northern Kara Sea were lower than in the Baidara Bay.

The dissolved oxygen was 3,45 ml/l (50 %) and 3,54 ml/l (53,6 %) in the bottom layer of the Baidara Gulf that is assumed to be very low for this region. The average oil hydrocarbon concentration in the bottom layer was about 0,56 mg/l and the oxygen was consumed for oxidation of oil hydrocarbon. At the over hand the bottom waters were enriched with dissolved iron and organic matter. It is a result of intensive resuspendization of fine-dispersed bottom sediments. The dissolved oxygen in water was also consumed for oxidation of this dissolved iron and organic



matter.

The data of complex expedition "Yamal-Arctic" show that the Kara Sea ecosystem is changing under the environmental change and it is necessary to continue monitoring of the Kara Sea for better understanding of observed trends in hydrochemical conditions.