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Title: *Current state and vulnerability of Yamal hydroecological systems (West Siberia, Russia)*

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Yamal peninsula is one of a scientifically interesting part of the Arctic. It is a lake-swamp system with unique hydrological, biological, and geochemical particularities. On the one hand according to Yamal geographical position the most part of water objects are under marine influence, on the other hand they have a strong anthropogenic impact from an oil and gas production. That is why estimation of water objects stability was a main aim of a comparison analyze of previous and current state of Yamal hydroecological systems. New data were received in the complex expedition "Yamal-Arctica 2012".

Hydrological and hydroecological investigation in august 2012 showed that in some lakes concentration of oil products was in 5 times more than maximum allowable concentration. Dissolved oxygen concentration in water objects was 8,6-16,2 mg l⁻¹, maximum of chlorophyll "a" concentration 6,7 µg l⁻¹, mineralization varied from 3 to 162 mg l⁻¹. Measured water discharges of small rivers allow to estimate an ionic runoff and suspended supply, in general. In rivers concentration of iron (Fe) grows because increase of a swamp runoff from catchment area according to climate warming and oil industry intensification. In spite of the ration TC/TN that has maximum 12, total carbon (TC) and total organic carbon (TOC) in suspended material was not more than 1,4 %. It means suspended supply from Yamal is not so high and mostly organic.

The concentration of colored dissolved organic matter (cDOM) values of the sampled lakes ranged from 0.9 to 8.4 m⁻¹ (mean 3.7 ± 2.2 m⁻¹), rivers have comparable values from 1.4 to 8.6 m⁻¹. cDOM concentrations from thermokarst lakes in central Yamal were within a medium concentration range (from 1,6 to 7,5 m⁻¹). Analysis of the spectral slope of absorption showed same values for rivers and lakes (0.015 nm⁻¹) indicating primarily terrestrial input of cDOM by organic soils instead of autochthonous production by phytoplankton.



In comparison with 80th years of last century studied Yamal lakes have changed very quickly due to eutrophication rather anthropogenic impact. Some objects were destroyed by production of sand for industrial building. Ice reduction in the Arctic Ocean and climatic changes increase marine factors in hydrographical system formation. Due to flooded tidal/surges area increasing there are a lot of hydrogen sulfide ponds and lakes near a coastline of the peninsula.

Geochemical analyses and dating for lacustrine cores are in proceeding now. It will allow receiving an intensity of sediment accumulation in different parts of Yamal and carried out some geochemical and ecological condition in the past.