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ARCTIC COASTAL TRANSIT AND CYCLIC AQUATIC SYSTEMS' HYDROLOGICAL AND GEOCHEMICAL PARTICULARITIES

Irina Viktorovna Fedorova (*Arctic and Antarctic Research Institute; St. Petersburg State University, Russian Federation*)

Antonina Aleksandrovna Chetverova (*St. Petersburg State University; Arctic and Antarctic Research Institute; , Russian Federation*)

Inessa Evgenievna Sidorina (*St. Petersburg State University, Russian Federation*)

Olga Nikitichna Bobrova (*St. Petersburg State University, Russian Federation*)

Birgit Heim (*Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Germany*)

Yury Alexandrovich Dvornikov (*Earth Cryosphere Institute, Russian Federation*)

Tatyana Viktorovna Skorospekhova (*Arctic and Antarctic Research Institute, Russian Federation*)

Anne Morgenstern (*Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research, Germany*)

Natalia Konstantinovna Shumskaya (*Arctic and Antarctic Research Institute, Russian Federation*)

Alexandra Alexandrovna Shadrina (*St. Petersburg State University, Russian Federation*)

umnichka@mail.ru

On a tidal and surge ground of Arctic coastal zone there are difference of lowland and mountain/rock shoreline parts with sea and riverine water interaction and sedimentation particularities. North America coastline (Shaw et al. 1998)¹ is more stable in comparison with North Eurasia (www.wwf.ru) banks; the Arctic intertidal zone is quite narrow because of not high tides value but its' influence, thereby, moves a backwater sometimes more than 70 km upstream. So, this interaction zone with specific streams, lakes, submarine groundwater discharge, large river runoff, wetlands etc. has numerous aquatic systems that could be divided into two main groups: transit and cyclic.

Cyclic systems (lakes, permafrost active layer, tundra ponds) of coastal zone are under marine influence and climatic changes. These both factors estimate geochemical characteristics as well as hydrological regime. Lowlands, flood and inundated areas include water objects with quite quickly water cycle and ecological succession changes with marine species near to a sea shoreline. Iron (Fe) accumulation and high nutrient concentration are typical at the same place. Ultra-oligotrophic lakes are more character on mountain and shields landscapes. There are specific relations between cDOM, DOC, DOM concentrations and geology, geomorphology, hydrology of water basins types in the Arctic.

Avalanche-type of sedimentation, heat flux, saline –fresh species enriched ecosystems, and active hydrological processes are specified in the mouths of large and small Arctic rivers rather estuaries and deltas. In the estuaries the border of avalanche sedimentation can be located upstream above than in the deltas. Such local factors as an ice complex thawing water and nutrient flux give additional source for material accumulation in the Arctic deltas. Geochemical barriers increase sedimentation, including pollution in some areas.

Results of hydrological and geochemical particularities of aquatic systems in the Arctic have been summarized in the built database and visualize on the coastal Arctic vulnerability zones map for the North Eurasia by GIS technology using. The database includes hydrometeorological, ecosystems abundance, and population health data. Mountain /shields catchments and wetlands are the most stable for climatic changes and human impact in opposite of marshes and unfrozen patch of water in the ice ("polynia") (Fedorova et al., 2014)².

Closed aquatic systems in the Arctic coastal zone could also be noticed. These are peatlands, glaciers, water of permafrost soil, ice complexes, and groundwater. They have a huge and long water exchange and, consequently, geochemical cycle period; and so closed systems are a gap of knowledge and future problem to be solved by modeling, experiments, and field measurements.

¹ Shaw J, Taylor RB, Forbes DL, Ruz M-H, Solomon S (1998) Sensitivity of the coast of Canada to sea-level rise. *Geol Surv Can Bull* 505:79 +map

² I.V.Fedorova, I.E.Sidorina, M.A.Rodichenko, T.V.Skorospekhova, A.A.Chetverova, V.V.Dmitriev, V.N.Shipovalnikov, N.K.Shumskaya, O.N.Bobrova, T.V.Parshina, Vlasenkov R.E. Geoinformation maintenance of the Russian Arctic coastal areas geosystems zoning on vulnerability rate. *Problems of Arctic and Antarctic* № 4, Vol. 102, in print.