

EGU2020-736

<https://doi.org/10.5194/egusphere-egu2020-736>

EGU General Assembly 2020

© Author(s) 2023. This work is distributed under the Creative Commons Attribution 4.0 License.



Study of sea water chemistry changes due to thawing permafrost

Maria Pogojeva^{1,3}, Evgeniy Yakushev^{2,3}, Ilya Petrov¹, Evgeniy Yaeski⁴, and Alexander Polukhin³

¹State Oceanographic Institute, Moscow, Russia (pogojeva_maria@mail.ru)

²Norwegian Institute for Water Research, Oslo, Norway

³Shirshov Institute of Oceanology RAS, Moscow, Russia

⁴North-West Branch NPO "Typhoon", Saint Petersburg, Russia

Influence of thawing permafrost on the chemical properties of the sea water was studied in 2 experiments organized in Svalbard in 2017 and 2018. Permafrost samples were collected at an abrasive cliff 10 km west of Longyearbyen. Experiments were focused on identifying the possible changes in concentrations of nutrients, carbonate system parameters and pollutant composition related to permafrost thawing. During the experiment, the samples of permafrost were added to the seawater. The solution was exposed to natural conditions for 24 hours in 2017 and 5 days in 2018 while water samples from the solution were taken at specified time intervals. The results of the experiment show that the sea water composition changes are connected to the permafrost thawing. Data from this experiment allowed us to estimate the total annual supply of nutrients to the Arctic from permafrost thawing by multiplying the change in concentration from this study by the annual eroded permafrost total volume in Siberia.