



Lead Author e-mail: i_govorina@mail.ru

Title: *Meteorological conditions, concentrations of carbon dioxide and ozone over the Kara Sea in summer 2012*

Irina Govorina¹, Andrey Bezgreshnov², Boris Ivanov²

¹*Saint-Petersburg State University, Russia*

²*Arctic and Antarctic Research Institute, St.Petersburg, Russia*

During last decades Earth's climate is changing. These climatic changes are being experienced earliest and most intensely in the Arctic region. The combination of melting sea ice and global atmospheric warming are contributing to the high rate of warming in the Arctic, where temperatures are increasing up to four times faster than the global average. Increased ultraviolet radiation reaching the surface as a result of ozone depletion and the reduction in springtime snow and ice cover will impact ecosystems on land and in water.

During almost two months from 1 August till 22 September 2012 measurements of air temperatures, radiation fluxes, carbon dioxide and ozone concentrations were carried out in the Kara Sea aboard research vessel "Professor Molchanov" in the scope of multidisciplinary project "Yamal-Artica".

According to our results the air temperature in August 2012 in the Kara Sea exceeded climatic mean by 2°C.

Many of the causes of the climate change in the Arctic can be attributed to the effect that humans have had on the atmosphere, greenhouse effect is mainly caused by the increase in CO₂ levels created by people. Yamal Peninsula is a rich of hydrocarbon resources with a high rate of the extractive industry. However values of CO₂ concentrations getting from our measurements did not exceed values from other Arctic region fixed by meteorological stations at Barrow, Alert, and Ny-Alesund.

Mean value of ozone concentration obtained during the cruise is 304 UD that is similar to concentration founded at Dikson meteorological stations. Negative trend in daily values can be explained by seasonal decreasing of ozone concentration. We compared ozone concentrations with satellite data from World Ozone and Ultraviolet Radiation Data Center (Canada) and found good matches.

Finally short-wave radiation, infrared radiation and photosynthetically active radiation fluxes measurements were carried out for further calculation of the surface layer energy balance defined the abundance of primary production in the Kara Sea.