

DYNAMICS OF COLORED DISSOLVED ORGANIC MATTER IN THE CLIMATE CHANGING ENVIRONMENT OF NORTHERN SIBERIA

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The Lena is one of the largest rivers in the world and is responsible, through its outflow to the Laptev Sea, for a significant fraction of the total fresh water and organic matter discharge into the Arctic Ocean. With the known effects of climate change in the Arctic and associated increase of permafrost thaw rates, the Lena River discharge and consequent export of terrigenous dissolved organic matter (DOM) into the Arctic Ocean tends to increase. Such variations may affect the nutrients and carbon dynamics in the region with consequences for the primary production and the CO₂ exchanges in the ocean-atmosphere boundary layer. Understanding the dynamics and optical properties of colored DOM (CDOM) is of great value for carbon cycle modelling since CDOM is the fraction of the DOM which interacts with light and can be detected by satellite ocean color remote sensing. In this context, this study aims to investigate the dynamics of CDOM regarding the hydrographical forcing in the Lena Delta region based on in situ data collected during the late summer 2013. Water column structure was assessed through temperature and salinity profiles acquired with CTD casts and the CDOM characterization and quantification were determined based on both absorption and fluorescence spectra obtained with a HORIBA® Aqualog spectrofluorometer. The CDOM absorption at 443nm (a_{443} ; used as a CDOM amount index) and the terrestrial and marine absorption slopes of CDOM [S_{TER} (275-295nm) and S_{MAR} (350-400nm), respectively] were obtained based on the absorption spectra. The CDOM components were identified by analysis of the excitation-emission-matrices and based on the literature. a_{443} was directly (inversely) related with temperature (salinity), denoting the strong modulation of CDOM by the hydrographical forcing: the highest CDOM amounts with riverine compounds were related to the Lena River Plume, while the salty waters from Laptev Sea presented lower a_{443} and associated with marine compounds.