



Structure of the upper layer of the Kara Sea influenced by Ob and Yenisei discharge based on continuous thermohaline and optical measurements

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The Kara Sea is significantly affected by continental runoff annually receiving about 1350 km³ of river waters. More than 70% of this volume is discharged from Ob and Yenisei gulfs in June - September and forms a buoyant plume that occupies up to 40% of the Kara Sea area. This work is focused on the structure of the upper layer of the southern part of the Kara Sea in September, 2011 which was dominated by large freshwater discharge. The research is based on the statistical analysis of in situ data collected during the 59th cruise of the R/V "Academician Mstislav Keldysh" along the ship track using a pump-through system (temperature, salinity, pH) and ultraviolet fluorescent lidar (concentrations of chlorophyll, total suspended matter and colored dissolved organic matter) with high space resolution (about 100 m). We performed principal component analysis of the large dataset to identify the areas where the considered water parameters can regard as passive tracers of river discharge. Proximity of discharge volumes of Ob and Yenisei rivers together with difference in their thermohaline and chemical properties relatively big distance between Ob and Yenisei gulfs (about 200 km) result in strong nonuniformity of the freshened plume. The subsequent cluster analysis identified spatial characteristics of different water masses within the studied river plume formed by two sources of freshwater discharge.