Alla Savenko¹, Oleg Pokrovsky², Irina Streletskaya¹

¹Moscow M.V. Lomonosov State University, ²National Research Tomsk State University, BIO-GEO-CLIM Laboratory; Federal Center for Integrated Arctic Research, IEPS, Arkhangelsk, Russia
Alla_Savenko@rambler.ru

The distribution of dissolved chemical elements (major ions, nutrients, and trace elements) in the Yenisei River estuary and adjacent water rea in 2009 and 2010 are presented. These results were compared to the data obtained during previous hydrochemical studies of this region. The transport of major cations (Na, K, Mg, Ca) and some trace elements (Rb, Cs, Sr, B, F, As, Mo, U) in the estuary follows conservative mixing. Alkalinity also belongs to conservative components, however this parameter exhibits substantial spatial heterogeneity caused by complex hydrological structure of the Yenisei Bay and adjoining part of the Kara Sea formed under the influence of several sources of desalination and salty waters inflow. Concentrations of $P_{\text{min}}$, Si, and V in the desalinized waters of photic layer decrease seaward owing to uptake by phytoplankton. The losses of these elements reach 30–57, 30, and 9% of their supply by river runoff, respectively. The content of dissolved phosphates and vanadium in the intermediate and near-bottom layers of the Yenisei River estuary strongly increases with salinity due to regeneration of precipitated organic matter, whereas silica remineralization is much less pronounced. Barium is characterized by additional input of dissolved forms in the mixing zone in the quantity comparable to that carried out by river runoff. This may be caused by its desorption from river suspended matter due to ion exchange. The transport of dissolved Al and Mn in the estuarine zone is probably controlled by the coagulation and flocculation of organic and organomineral colloids.