



Sedimentation in the Lena river delta and adjacent part of the Laptev Sea

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Any attempt to understand the effects of the Arctic Ocean on global change or the effect of global change on the Arctic Ocean requires a thorough understanding of coastal processes. The major transport of freshwater, dissolved and solid materials into the Arctic ocean is determined by riverine discharge and coastal erosion from Eurasia. The Lena River drains almost 3 mill. km² of the vast Siberian hinterland (which is now under strong warming impact), and discharge up to 720 km³ per year, making it the second largest river draining into the Arctic Ocean. Thus, it is extremely important to perform a base-line study in the key area of the near-shore Arctic ocean which integrates Lena River discharge, which is a product of permafrost degradation in the Lena watershed, and off-shore export of eroded material, which is mostly induced by retreatment of the coastal ice-complex. Since 1999, the Buor-Khaya Gulf was chosen for detailed investigation by Laboratory of the Arctic Research (LAR) of the Pacific Oceanological Institute as a key area which accepts both eroded carbon and solid discharge from the Bykovsky and Bol'shay/Malaya Trofimovsky channels of the Lena delta. The intention of this report is to present a first comprehensive interpretation of the modern depositional environment in the Lena river delta and Buor-Khaya Gulf considering all the geochemical data obtained both in the International Siberian Shelf Study 2008 (ISSS-08) and 11 previous summertime and wintertime LAR expeditions (1999-2007), accomplished in cooperation with the International Arctic Research Center of the University Alaska Fairbanks. Set of samples was studied in cooperation with the Stockholm University and Swedish Museum of Natural History. Detailed transects and maps of the particulate material distribution, particulate organic carbon (POC) and nitrogen (PON) as well as C/N stable isotopes in both suspended particles and underlying surface sediment, and its sizing are discussed in connection with changing hydrometeorological conditions with a special emphasis on the area surrounding Muostakh Island, which exhibits rates of coastal erosion up to 15-20 m during couple summertime weeks.