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TITLE: SPATIAL-TIME VARIABILITY OF PARTICULATE MATERIAL CONTENT AND ITS COMPOSITION ON THE EAST SIBERIAN SHELF: FROM MESOSCALE TO INTERANNUAL VARIABILITY

ABSTRACT BODY: Here we present the data obtained in the Russia-US cruises (FEBRAS, NOAA, NSF, and Russian Foundation for Basic Research, RFBR, funded) in 2000, 2003-2005, and in the International Siberian Shelf Study-2008 (ISSS-2008, supported by the Wallenberg Foundation, FEBRAS, NOAA, and RFBR) which characterized a spatial and inter-annual variability in distribution of particulate material (PM), and its organic carbon and stable isotopes content.
The role of the coastal zone in lateral transport and fate of terrestrial organic carbon in the East Siberian Arctic Shelf (ESAS) is still not studied well because most recent activities were focused on onshore geomorphologic and geochemical features, while biogeochemical and sedimentation consequences of coastal erosion and riverine runoff in the sea were not studied sufficiently.
Dynamics of PM and its composition was studied twice along the Lena river in summer-fall of 2003. Spatial-time dynamics of PM composition (POC and isotopes) along with its mineralogical composition is considered in connection with changing river runoff and wind patterns. It has been found that not the rivers (Lena, Yana, Indigirka, Kolyma), but the coastal erosion is a dominant source of terrestrial particulate organic carbon (POC) into the ESAS. That supports the hypothesis about the dominant role of coastal erosion in the offshore transport of terrestrial organic carbon and sedimentation in the ESAS proposed by Semiletov (DAN, 1999).
The PM concentration sharp gradient was found across the frontal zone between “freshened/high PM” and “Pacific/low PM” waters. Position of the frontal zone varies significantly from year to year. It is mainly attributed to the difference in atmospheric circulation patterns driven the Arctic Ocean circulation. During storms and surges the PM concentration in the same area increased up to 10-times and higher (up to 80-242 mg/l) in 2000 and 2005 comparing the 2003 and 2004. Values of total PM and other environmental parameters were integrated vertically and spatially for the “comparison” area using approach proposed by Shakhova et al. (GRL, 2005) to make the first quantitative PM burden estimation (2003 vs 2004).

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