Geophysical Research Abstracts
Vol. 12, EGU2010-6194-1, 2010
EGU General Assembly 2010
© Author(s) 2010

Spatial-time variability of particulate material content and its composition: From mesoscale to interannual variability

Oleg Dudarev (1), Alexander Charkin (1), Igor Semiletov (1,2), Örjan Gustafsson (3), Jorien Vonk (3), and Laura Sánchez-García (3)

(1) Pacific Oceanological Institute (POI), Far Eastern Branch of Russian Academy of Sciences (FEBRAS), Vladivostok, Russia, dudarev@poi.dvo.ru / Phone +7-4232-313073 , (2) International Arctic Research Center (IARC), University of Alaska, Fairbanks, USA, (3) Department of Applied Environmental Science and the Bert Bolin Climate Research Centre, Stockholm University (SU), Sweden

The role of the coastal zone in lateral transport and fate of terrestrial organic carbon in the East Siberian Arctic Shelf (ESAS) has not been well studied to date because most recent activities have focused on onshore geomorphologic and geochemical features, while biogeochemical and sedimentation consequences of coastal erosion and riverine runoff into the sea were not studied sufficiently. Here we present the data obtained on joint Russian-US cruises (NOAA and NSF funded) in 2003, 2004, 2005, and in the International Siberian Shelf Study-2008 (ISSS-2008, supported by the Wallenberg Foundation, FEBRAS, NOAA, and the Russian NSF), which characterized a spatial and interannual variability in distribution of particulate material (PM), and its organic carbon and stable isotopes content. Dynamics and composition of PM were studied twice along the Lena River in summer-fall of 2003. Here, the spatial-time dynamics of PM composition (particulate organic carbon (POC), isotopes and mineralogical composition) is considered in connection with changing river runoff and wind patterns. It has been found that the dominant source of POC into the ESAS is coastal erosion, rather than input from the rivers (Lena, Yana, Indigirka, Kolyma). A sharp PM concentration gradient from “freshened/high PM” to “Pacific/low PM” waters was found across the frontal zone. The position of the frontal zone varies significantly from year to year; this difference is mainly attributed to the difference in atmospheric circulation patterns driving the Arctic Ocean circulation. During storms and surges the PM concentration in a single area was increased by 10 times or more (up to 80-242 mg/l) in 2000 and 2005 compared to the 2003 and 2004 PM concentration.