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Characterization of particulate material dynamics and composition in the benthic layer of the East Siberian Sea and adjacent part of the Laptev Sea: Fine vertical structure.

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The near-shore zone of the Laptev and East Siberian seas is the most climatically sensitive area in the Arctic and has the highest rates of coastal retreat (Grigoriev, EGU-2010, this session). Our multi-year data (1999-2009) show that major transport of terrestrial organic material to the East Siberian Arctic marine system results from coastal erosion. Biodegradation of this coastal material is a regional source of high pCO2 in waters of the East Siberian Arctic Shelf (ESAS) (Anderson et al., 2009; Pipko et al., EGU-2010, this session; Semiletov et al., 2007). Partitioning between eroded particulate organic carbon (POC) degradation in water and in sediment is still poorly studied. Here we present and discuss peculiarities of particulate material (PM) and POC distribution in the ESAS benthic layer obtained during the 50-day International Siberian Shelf Study (ISSS-2008) onboard the H/V Yakob Smirnitsky. Basic materials were obtained using a GEMAX corer, which allows the sampling of undisturbed surface sediments (down to 1 m in depth) and bottom water. It was found that the vertical PM gradient in the thin benthic layer was 3000 times larger than the PM gradient across the pycnocline. The highest gradients were found in the river paleocanyons and along the Chaunsky –Kolymski Trench. Vertical profiles of POC and its C13 and C/N ratio in the benthic layer demonstrate the increasing contribution of terrestrial organic carbon with increasing depth.

References

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