



Nutrients Seasonal Variability and Carbonate System Dynamics in the Laptev Sea coastal zone

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The Arctic ocean has the broadest shelf in the World ocean: the continental shelves occupy about 36% of the Arctic oceanic area. Moreover, greater than 90% of all organic carbon burial occurs in sediments depositing on deltas, continental shelves, and upper continental slopes, and the significant portion of organic carbon withdraw is occurred over the Siberian shelf (Macdonald et al., 2008). The coastal zone plays an important role in the East Siberian Arctic land-shelf-basin system, because the major transport of fresh water, dissolved and solid material into the Arctic Ocean is determined by 1) the riverine discharges, and 2) coastal erosion.

Production in the Arctic is highly seasonal, and it is important to consider the magnitude of seasonal variations in nutrients. Here we present the results (nutrients, parameters of the carbonate system, and oxygen) obtained during ice-covered season (April of 2002 and 2007) and open water season (September of 2000 and 2005) over the south-eastern part of the Laptev Sea which is under strong influence of the Lena river and coastal erosion. High spatial-temporal variability in nutrients (ammonium, nitrates, nitrites, phosphate, and silicates) and carbonate parameters (pH, pCO_2 , and pCO_2) distributions has been found. We suggest that relatively high (vs entire oligotrophic Laptev and East Siberian seas) productivity of the coastal zone is related not only to the influence of the river inputs, but also the coastal erosion, enriching the coastal waters in nutrients and terrestrial organic matter and to the close coupling between the water and sediment, assuring a rapid reutilization of regenerated elements. Highest anomalies of all parameters (for instance: pCO_2 up to 4000mkatm) are associated with the areas strongly affected by coastal erosion.

References

Macdonald R.W., Anderson L.G., Christensen J.P., Miller L.A., Semiletov I.P., and R. Stein, 2008. The Arctic Ocean: budgets and fluxes, In "Carbon and Nutrient Fluxes in Continental Margins: A Global Synthesis," Edited by K.-K. Liu, L. Atkinson, R. Quinones, L. Talaue-McManus, Springer-Verlag, 291-303.