

Seasonality of suspended particulate matter distribution in the White Sea: Results of remote sensing and field measurements

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SEASONALITY OF SUSPENDED PARTICULATE MATTER DISTRIBUTION IN THE WHITE SEA: RESULTS OF REMOTE SENSING AND FIELD MEASUREMENTS A.P. Lisitzin, V.P. Shevchenko, V.I. Burenkov, O.V. Kopelevich P.P. Shirshov Institute of Oceanology RAS, Moscow, Russia The study of suspended particulate matter (SPM) and chlorophyll in the Ocean (both in the remote areas and in the coastal zone) is necessary for understanding modern sedimentation processes and for conducting ecological assessments of the state of the environment. In near future the White Sea could be subjected to anthropogenic stress due to the timber industry, diamond mining, oil transportation on the land and in sea. Intensive SPM studies in the White Sea were started in 2000 under the auspices of the “White Sea System” project. In 2000–2004 over the course of 21 expeditions onboard different research vessels multidisciplinary research, including SPM studies, were carried out in the White Sea. More than 2000 samples of SPM were obtained by filtration of water through the nuclepore filters with 0.45 mm pores. The data of the SeaWiFS and MODIS satellite color scanners were used for the study of the variability of the SPM distribution in the space and time. A high suspended matter concentration (5–20 mg/l) is characteristic of the areas affected by riverine runoff. The Northern Dvina is the main source of riverine SPM to the White Sea. SPM concentrations sharply decrease towards the sea and the majority of particles are sedimented in the marginal filter. The minimum of SPM concentration (<0.5 mg/l) is observed in central parts of the White Sea – Basin, deep part of the Kandalaksha Bay and in the western part of the Voronka. The strong seasonality of SPM distribution and composition in the White Sea has been identified. The highest concentrations of SPM are registered during the spring flood; terrigenous material dominates the composition of SPM at this time. In summer SPM concentration decrease. The lowest concentrations of both terrigenous and biogenic SPM are observed in winter. The seasonality of SPM concentration is reflected in the seasonality of vertical particle fluxes. Our studies were supported by the Federal Targeted Program “The World Ocean”, Presidium of the Russian Academy of Sciences (projects No. 4.5 and “Nanoparticles”), the Russian Fund for Basic Research (grant No. 02-05-65080). Contact information: Lisitzin Alexander Petrovich, academician of the Russian Academy of Sciences E-mail: lisitzin@geo.sio.rssi.ru Telephone/Fax: 7-095-1248528 Address: P.P. Shirshov Institute of Oceanology RAS Nakhimovsky Prospekt, 36117997 Moscow, Russia