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The South-Eastern Baltic Sea floor mapping

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The Russian part of the south-eastern Baltic Sea has been heavily influenced in recent years by the increasing anthropogenic impact caused by recreational activities, offshore oil extraction, fishing, dredging, construction of ports and liquefied natural gas terminals, creation of artificial beaches etc. The grant No. 14-37-00047 of Russian Scientific Fund, sponsored by the Russian Government, is directed at solving the problems of the sustainable use of marine resources and protection of coasts. The specific objective of the project is to create a cadastre of the offshore zone of the south-eastern part of the Baltic Sea. Geological mapping provides the basis for the establishment and maintenance of cadastre.

Within the framework of the project, high-resolution multibeam bathymetry, backscatter and sediment sample datasets at an unprecedented resolution and coverage were obtained. Bathymetric and seabed sediment type maps at a scale 1:50 000 were created using ArcGIS software.

In the nearshore zone (up to water depths of 30 m) the seafloor is mostly covered by sand of different grain-size and genesis. The resulting maps allow many special features of surface sediments distribution to be determined, among them the relict lagoon's marl outcrops offshore the Curonian Spit. Greenish-grey, organic-rich, laminated, dense clays, partly covered by sand, are located at depths from 5 to 15 m. The amber-bearing Paleogene sediment ("blue earth") outcrops were detected on the west of the Sambian Peninsula at depths of 10-15 m. The morphology of the underwater shore slope is characterized by a series of terraces formed during Holocene sea-level oscillations. Areas of coarse-grained sediments (boulders and pebbles) mark the glacial till.

At water depths greater than 70 m, new geomorphological features were identified. The extensive chaotic ploughmarks (furrows) of 1 m depth and up to 10 m width, in most cases are infilled by a thin layer of mud, and were discovered at the surface of the Gdansk-Gotland sill glacial deposits. Most of the furrows are V- or U-shaped stepped depressions and can be attributed to the action of iceberg scouring. Icebergs were common in the Baltic Ice Lake which was developed in front of the receding Scandinavian Ice Sheet between c. 15 000-11 600 cal yr BP.

Seabed mapping provides information for further investigations of lithodynamic processes, marine landscapes and benthic habitats and their sensitivity to anthropogenic impact.

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