



Holocene development of the eastern Gulf of Finland coastal zone (Baltic Sea)

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In 2011–2013 geoarcheological and marine geological research of the eastern Gulf of Finland coasts and near-shore bottom were undertaken. Researches were concentrated within several key-areas (Sestroretskaya Lowland, Narva-Luga Klint Bay and southern coastal zone of the Gulf (near Bolshaya Izhora village). Study areas can provide important information about Gulf of Finland Holocene coastal development as since Ancylus time (about 10000 cal.BP). Development of numerous sand accretion forms (spits, bars, dunes) of different shape, age and genesis caused formation of lagoon systems, situated now on-land due to land uplift. Coasts of lagoons in Sestroretskaya Lowland and Narva-Luga Klint Bay were inhabited by Neolithic and Early Metal people. Analysis of coastal morphology and results of geological research (GIS relief analyses, ground penetrating radar, drilling, grain-size analyses, radiocarbon dating) and geoarcheological studies allowed to reconstruct the mechanism of large accretion bodies (bars and spits) and lagoon systems formation during last 8000 years. Geoarcheological studies carried out within eastern Gulf of Finland coasts permitted to find some features of the Neolithic - Early Metal settlements distribution. Another important features of the eastern Gulf of Finland coastal zone relief are the series of submarine terraces found in the Gulf bottom (sea water depths 10 to 2 m). Analyses of the submarine terraces morphology and geology (e.g. grain-size distribution, pollen analyses and organic matter dating) allow to suppose that several times during Holocene (including preAncylus (11000 cal.BP) and preLittorina (8500 cal.BP) regressions) the sea-water level was lower than nowadays. During the maximal stage of the Littorina transgression (7600–7200 cal. BP) several open bays connected with the Littorina Sea appeared in this area. The lagoon systems and sand accretion bodies (spits and bars) were formed during the following decreasing of the sea level. Late Neolithic–Early Metal Epoch archaeological contexts of the end of the 6th to the beginning of the 5th ka BP mark the rate of regression. The results of geological research of submarine terraces and modeling show that by the time period about 3000 cal. BP, relative water level decreased (in the vicinities of Sestroretskaya Lowland and Bolshaya Izhora village by modern depth of about 3 m). The main trend of the final stage of paleogeographical development was the gradual relative sea-level rise up to the modern shoreline. Studies are supported by Russian Foundation for Basic Research (projects 12-05-01121 and 12-05-31196).