Geophysical Research Abstracts
Vol. 16, EGU2014-13875, 2014
EGU General Assembly 2014

Stone Age settlement and Holocene water level changes of the Baltic Sea in the Torvajoe Basin area, Narva-Luga Klint Bay, NE Estonia

Hanna Raig (1), Alar Rosentau (1), Merle Muru (2), and Jan Risberg (3)

(1) Department of Ecology and Earth Sciences, Institute of Geology, University of Tartu, Estonia (hanna.raig@ut.ee) (alar.rosentau@ut.ee), (2) Department of Ecology and Earth Sciences, Institute of Geography, University of Tartu, Estonia (merle.muru@ut.ee), (3) Department of Physical Geography and Quaternary Geology, Stockholm University, Sweden (jan.risberg@geo.su.se)

The Tõrvajõe basin is located in NE Estonia in the southern part of the Narva-Luga Klint Bay, that is characterized by slow post-glacial isostatic uplift (about 0-1mm/yr) and slowly undulating low topography. Post-glacial changes of the water-level of the Baltic Sea have at times flooded the area, and at times, it has emerged as terrestrial land. In addition to a complex geological development, the surroundings of the Tõrvajõe basin are interesting from the archaeological point of view because of abundant archaeological findings in the area, of which the oldest (c 8.1 cal ka BP) from the Mesolithic period and the majority, indicating very intense habitation (c 7.1-5.5 cal ka BP), from the Neolithic period. Development of the Tőrvajőe basin area during the period of Stone Age settlement (c 8.1–5.5 cal. ka BP) is studied with multiple geological and archaeological proxies. Sediments are described by lithostratigraphical methods, loss-on-ignition. AMS radiocarbon dates are used to date events and create an age-depth model. Environment is described by pollen analyses and water environment by siliceous microfossil analyses. Palaeogeographical reconstructions for time slices of interest are created to illustrate Stone Age settlement pattern and changes of the coastline and landscape over time. The aim of this interdisciplinary study is to investigate and associate palaeoenvironmental conditions and water-level changes with Stone Age settlement pattern in the Tőrvajőe area. Results show four developmental stages in the post-glacial history of the basin: Ancylus Lake lagoon, mire, lagoon during the Litorina Sea and mire. During the Ancylus Lake transgression at about 10.8–10.2 cal. ka BP a spit started to form north of the basin and a lagoon evolved behind it. Following the Ancylus Lake regression river activity and formation of palaeosoil and fen peat took place. Due to the Litorina Sea transgression, that was initially slower but accelerated around 7.8-7.6 cal ka BP when the sea-level rose c 6m in less than a thousand years, the Siivertsi site (8.1 cal ka BP) was inundated and a coastal lagoon evolved in the basin. Shores of this lagoon were preferable living environments for Neolithic people between 7.1-6.1 cal ka BP as appears from 15 settlement sites around the basin. Due to slowing of water-level rise and on-going land uplift, the water body dried up. People abandoned the Tőrvajőe lagoon and concentrated mostly along the ancient rivers in Narva-Luga Klint Bay (Rosentau et al., 2013).

References

Rosentau A., Muru M., Kriiska A., Subetto D. A., Vassiljev J., Hang T., Gerasimov D., Nordqvist K., Ludikova A., Lõugas L., Raig H., Kihno K., Aunap R., Letyka, N. 2013. Stone Age settlement and Holocene shore displacement in the Narva-Luga Klint Bay area, eastern Gulf of Finland. Boreas. 10.1111/bor.12004. ISSN 0300-9483