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Distribution of magnetic susceptibility in the vertical profile of sediments and the presence of particular groups of organisms in spread of the second-tributary of the Baltic Sea - Vistula River

Żaneta Kłostowska, Halina Kendzierska, Anna Borecka, Grzegorz Kusza and Leszek Łęczyński University of Gdansk, Institute of Oceanography, Poland

Tistula is the biggest, in terms of size, Polish river, annually brings to the Baltic Sea from 0.6 million m3 to 1.5 million m3 of sediment. Anthropogenic pollutions brought together with the waters of the rivers to reservoirs are a significant threat to the ecosystem. In particular, brought loads of pollutants containing heavy metals, petroleum substances, inorganic complexes or biogenic substances. Prevailing hydrodynamic conditions in the area have also a significant influence on the composition of the bottom sediments. Magnetic susceptibility is defined as a geophysical quantity which describes the ability of a substance to change the magnetization under the influence of an external magnetic field. Especially important is the frequency dependence of magnetic susceptibility fd [%], which value indicates the type of pollution, when fd = 0.5% anthropogenic pollution, fd =5-15% enrichment of natural character. The studies are a pilot for the bottom sediments of the Gulf of Gdansk area. The aim of the study was to determine the relation between the magnetic susceptibility in sediments and the occurrence of particular groups of organisms in the vertical profiles of sediments. Samples were collected at three sites in the Gulf of Gdańsk (southern Baltic Sea, Europe) in July 2014 during BONUS COCOA project cruise. Stations were situated within increasing distance from Vistula River mouth at the depth of 16, 24 and 48 m. At all stations sediments we analyzed bottom water conditions, sediment characteristics (organic matter content, water content, magnetic susceptibility, grains size) and structure and burial depth of benthic macrofauna communities. Measurements of the magnetic susceptibility were performed using magnetic susceptibility meter MS2 and MS2 B Bargtington sensor (magnetic susceptibility was made as part of NCN (No. DEC-2012/07/B/ ST10/ 04080). At two shallower stations we observed fine sands and at the deepest station sandy muds. Also benthic fauna differ between depth zones. At shallower stations abundance of epifauna was significant in community structure and although organisms were buried into sediment up to 10 cm, most of them were living in top centimeters. At deepest stations the vast majority of organisms belonged to infauna, buried up to 15 cm into sediments. Based on these results it can be concluded that there is a significant correlation between the examined parameters and the value of magnetic susceptibility. The value of the fd [%] in the vertical profiles of sediments testifies to the re-deposition of pollutants from the deeper parts of the surface layer, which may be caused by the activities of individual groups of organisms.

## Biography

Żaneta Kłostowska graduated MSC degree in 2014, at the Department of Oceanography at the University of Gdansk. She's master thesis was related to seasonal variation of metal concentrations in the sediments of the Gdańsk Basin area. She is currently a student of the 2nd year of PhD study. Research topic relates to marine sediment - in particular - chemistry, magnetic susceptibility, and the dynamics of change in areas subjected to anthropopression.

zaneta.klostowska@phdstud.ug.edu.pl

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