

Deep submarine groundwater discharge indicated by chloride anomalies in the sediment pore water in the Gulf of Gdańsk, southern Baltic Sea.

BEATA SZYMCZYCHA¹, ŻANETA KŁOSTOWSKA^{1,2},
KAROL KULIŃSKI¹, ALEKSANDRA WINOGRADOW¹,
JAROMIR JAKACKI¹, ZYGMUNT KLUSEK¹, MIŁOŻ
GRABOWSKI¹, ALEKSANDRA BRODECKA-GOLUCH²,
BOŻENA GRACA², MARCIN STOKOWSKI¹,
KATARZYNA KOZIOROWSKA¹, DANIEL RAK¹

¹ Institute of Oceanology, Polish Academy of Sciences,
Powstańców Warszawy 55, 81-712 Sopot, Poland,
beat.sz@iopan.gda.pl

² Institute of Oceanography, University of Gdańsk, Al.
Marszałka Piłsudskiego 46, 81-378 Gdynia, Poland

Submarine groundwater discharge (SGD) is a significant pathway for material transport to the coastal zone. For some elements and isotopes SGD has been thought to be the principal source. Therefore, the interest in coastal groundwater flow systems has increased rapidly during the last decades. Most of the studies have been focused on shallow (<20m), narrow zone (<5km) along the coastline. Interestingly, some deep seafloor studies indicated that SGD can occur a long distance from the shoreline (~25km). In the Baltic Sea SGD has been mainly investigated in the southern part primarily at coastal zones demonstrating that groundwater seepage is comparable to rivers loads in case of selected chemical substances. In this study we identified deep SGD located at acoustically turbid sediments in the Gulf of Gdańsk (~70 km from the shore). Given the significance of benthic nutrients dynamics and sediment biogeochemical processes implications for the Baltic Sea environment, such as eutrophication, hypoxic and anoxic events, we aim to characterize the potential role of deep SGD in the Baltic Sea cycles of elements.

The results were obtained within the framework of the following projects: 2016/21/B/ST10/01213 sponsored by National Science Center and WaterPUCK financed by the National Centre for Research and Development (NCBR) within BIOSTRATEG program.