

The influence of major rivers discharges on physical and biological state of the Baltic Sea

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River discharges are one of very important factors affecting the marine ecosystem functioning. Land-originated inflows, carrying fresh, nutrient-rich water can be often defined as the factor responsible for creating new physical and biochemical conditions, which in turn can create more or less favorable medium for many marine organisms to run their biological cycles within. In some basins, the Baltic Sea including, land-originated water inflows are usually associated with the eutrophication and are the factors, which trigger this process. It is clear that not only because of the riverine discharges, the nutrients levels in the sea increase. To exemplify in the case of phosphorus, the nutrient concentration can be raised by 'internal re-loading', which is caused by phosphorus pools accumulated in the sediments of the sea bed being released back to the water under anoxic conditions.

In the present study, we focused on the major Baltic rivers inflows and their impact on the environmental state of the basin. We have examined river discharges (expressed as volumetric inflow in $\text{m}^3 \text{s}^{-1}$) and the nutrient load (phosphorus, nitrogen) accompanied by these inflows. Data for our investigation were derived from EHype model (Swedish Meteorological Institute Server, <http://hypeweb.smhi.se/europehype/time-series/>). From the river discharge model data set spanned over 1981 – 2010, we have calculated long-term trends and the basic statistics: annual and monthly means, percentiles (10th, 50th, 90th). The trends were defined to be statistically significant at the confidence level of 95% ($p < 0.05$).

What is more, we have estimated the inflows extent and related to tributaries changes in three-dimensional distribution of seawater physical properties on the basis of hydrodynamic model.

Land-sea interface comprise an important link in the water body state analysis. This research comprises a discussion of river runoffs significance evaluation in the Baltic Sea area.

This work has been funded by the National Centre of Science project (contract number: 2012/07/N/ST10/03485) entitled: "Improved understanding of phytoplankton blooms in the Baltic Sea based on numerical models and existing data sets".

The Author (AC) received funding from National Centre of Sciences in doctoral scholarship program (contract number: 2016/20/T/ST10/00214).