

O21.4**Modelling the marine coastal zone using a well-fed ecohydrodynamic model**

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Abstract

We present the capabilities and results obtained with one of the WaterPUCK online toolkit's products. WaterPUCK is an innovative and complex toolkit that enables researchers to identify the sources of nutrient and pesticide pollution, understand the main mechanisms responsible for the transport of these pollutants in surface and groundwater, calculate their flux via rivers and SGD, and directly assess the influence of pesticides and nutrient flux on the Bay of Puck (southern Baltic Sea) ecosystem, including the creation of scenarios projecting the effects of changes in land use on chemical loads from the Puck Commune that are transported via surface and groundwater to the Bay of Puck. One of the models that the toolkit consists of is the ecohydrodynamic model of the Bay of Puck, named the EcoPuckBay (EPB), which is discussed in this presentation. It is crucial that the biochemical part of the EPB model is fed with inputs from the SWAT surface run-off model and Modflow groundwater flow model which are also coupled with each other. As part of the EPB model, we developed a tool named the Nutrient spread module (NSM). With the NSM it is possible to model the expected distribution of agricultural substances in the waters of the bay in a short period of time (10 days), which can be helpful when extreme events occur and in making decisions to mitigate the negative effects associated with them. Solutions that comprehensively connect the marine and land environment are essential for resources monitoring and management especially in the coastal zone which plays a beneficial role for humans.

This work was supported by the National Centre for Research and Development of Poland within the BIOSTRATEG III program No: BIOSTRATEG3/343927/3/NCBR/2017.

Keywords

numerical modelling, ecosystem, biogeochemical model, nutrients