

32. Parametrization of coastal sources of geosynthetic pollution in the SHYFEM model based on the random walk algorithm

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Coastal protection structures are sources of debris of geosynthetics released from them by storms. They are distributed along the shore and serve as secondary sources. The mean square deviation from the source is $=2 \cdot D \cdot t$. Diffusivity coefficient D was estimated during field campaigns 2018-2019 and used in numerical simulations by the SHYFEM model for the Sambian Peninsula.

Coastal protection structures become sources of new type of pollution: debris of geosynthetics is released from them after damage by storms. These pieces are distributed along the shore as marine litter and serve as secondary sources of synthetic macro and micro particles during the next storms. Since (i) spatial distribution of such secondary and following sources can be assumed as random due to the variability of wind and currents in coastal zone during rather long period, and (ii) the next state of its distribution

depends on the current state only and not on the past history, the approach of random walk (proposed for marine litter in RFBR Project 18-55-76001) could describe the alongshore effective diffusion of particles without absorption. The mean square deviation from the mother source is $=2 \cdot D \cdot t$, where t is the time. Diffusivity coefficient (D) was estimated during field campaigns 2018-2019 of **RFBR Project 18-55-76002**, and used to reproduce numerically the geotextile debris distribution along the northern shore of the Sambian Peninsula (South-Eastern Baltic). The numerical simulations were conducted by the Simple Sediment Transport module of the SHYFEM model.

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