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## Numerical modelling of the Sevastopol bays for microplastics transport assessment

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Forecasting of the transport of the anthropogenic pollution at the sea surface is rather important problem. The major microplastics (MPs) sources for the open sea are considered to be cities and river run-off. The bays of large port cities are usually suffer from significant anthropogenic load. However, the features of the transport of polymer particles in the urban coastal zone have been studied insufficiently due to the large number of the physical processes that act there. The complex form along with the presence of shore protection structures can lead to accumulation of polymer pollutants in the bay. There are also some difficulties in acquisition of data on pollution level from the local authorities. It is the case for the Black Sea basin where rather few works were carried especially for the city bays. Understanding the circulation in the bay of city and appropriate measurements of MPs concentration allows to estimate the amount of polymer pollution released to the open sea.

Recently, we have conducted such studies in the bay of a large port city of the Russian part of the Black Sea coast –the Sevastopol. The bay is significantly stretched in the zonal direction and is an estuarine basin. The easternmost part of the bay occupied by the river mouth. The breakwaters in the western part can reduce water exchange with the open sea twice by some estimates.

The study investigates the circulation induced by the prevailing winds and storm surges out of the bay and the corresponding effect on MPs concentrations: removal, accumulation and redistribution. The circulation in the bay is reconstructed by means of NEMO modelling framework. Due to the very complex coastline a regional configuration has been developed, which allows numerical modelling in city bays on an irregular grid with a spatial resolution reaching 30 m in some places. The open boundary out of the bay is used. To assess the relevance of the developed configuration numerical experiments are carried out with a uniform wind field: constant and with a daily climate variability.

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