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## Model based assessment of drift and fate of marine micro plastics in the Baltic Sea

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Marine micro plastic is a growing problem, because of its ability to accumulate in the environment. Reliable data of drift patterns and accumulation zones are required to estimate environmental impacts on natural protected areas, spawning areas and vulnerable habitats. H2020 project CLAIM (Cleaning Litter by developing and Applying Innovative Methods) uses model based assessments to improve the knowledge on marine pathways, sources and sinks of land emitted plastic pollution. The assessment follows a systematic approach, to derive reliable emission values for coastal sources, and to model drift and deposition pattern of micro plastics from multiple sources: car tyres, cosmetic products. A 3D modelling tool has been developed, that includes all relevant key processes, i.e. currents and wave induced transport, biofilm growth on the particle surface, sinking and sedimentation. Core engine is the HBM ocean circulation model, which has been set-up for the Baltic Sea in high resolution of 900m. Multi-years-studies (2013-2019) were performed to evaluate seasonal drift pattern and accumulation zones. Highest micro plastic concentrations were found in coastal waters, near major release locations, but transport related offshore pattern can be found as well. These follow the major pathways of deeper sea transport, but are controlled by the seasonal dynamic of biofilm growth and sinking. We introduce the model and all relevant key processes. Seasonal drift pattern are discusses in detail. Validation results in the Gulf of Riga and the Gulf of Finland provide an overview of the quality of the model to predict the distribution of micro plastics. The study includes the assessment of mitigation scenarios, of 30% micro plastic load reductions. The impacts on the ocean levels of micro plastic concentrations are studied in detail.