
How much plastic flows into the sea and what are the implications for policy? Case study of Flanders.

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Abstract

Flanders, Belgium's northern region, is committed to reducing plastic litter inflow into the marine environment by 75% by 2025, which aligns with initiatives such as the EU Green Deal and the ongoing Plastic Treaty negotiations. Achieving this ambitious environmental target requires an understanding of the sources, flow, and fate of plastic from the Flemish inland waterways into the North Sea. To this end, various projects, both local and European, have contributed to the knowledge base for further mitigation measures and actions. First, the PLUXIN project addressed these knowledge gaps by employing a multidisciplinary approach, combining research efforts within a quadruple-helix community of practice. One of the main outcomes from the data collection (macro-microplastic) and subsequent modelling (i.e. the hydrodynamic plastic dispersion model (in TELEMAC-MASCARET), is that the vast majority of plastic items remains trapped within the Scheldt estuary, due to the asymmetric tidal regime. In contrast to previous assumptions, it was found that plastics move up and down the estuary with ebb and flood before eventually settling down in hotspot areas. To validate the model outcomes, in April 2024, the follow-up project PLASTFLOW has been initiated by the government of Flanders, considering the influence of hydrodynamic processes on the plastic transport in the Scheldt estuary. Next, the findings on litter transport and plastic fate are extrapolated to other complex estuarine systems. In the InterregNorthSea TREASURE project, the Yzer estuary serves as a living lab for studying litter pathways and identifying optimal locations for litter removal. Mathematical modeling, facilitated by

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adapted TELEMAC software, will enhance understanding and management efforts related to riverine and marine litter. This presentation will provide insights gathered from the Flanders case study, highlighting lessons learned regarding plastic transport dynamics and policy implications from a local to international level, while offering perspectives on navigating collaborative communities of practice.

Keywords: hydrodynamic plastic model, plastic behaviour, management solutions, community of practice, policy targets, estuarine litter