

## The Plastic Pirates Go Europe! Initiative in Belgium: a citizen science project for the observation of riverine and coastal litter

Debaveye Line<sup>1</sup>, Nitschke Therese<sup>2</sup>, Seys Jan<sup>1</sup>, Dhondt Charlotte<sup>3</sup>, Cabrera Patricia<sup>3</sup> and Catarino Ana I.<sup>2</sup>

<sup>1</sup> Science Communication division, Flanders Marine Institute (VLIZ), InnovOcean Campus, Jacobsenstraat 1, 8400 Oostende, Belgium

E-mail: line.debaveye@vliz.be

<sup>2</sup> Plastics in Local and Global Waters, Research Department, Flanders Marine Institute (VLIZ), InnovOcean Campus, Jacobsenstraat 1, 8400 Oostende, Belgium

<sup>3</sup> Data Centre division, Flanders Marine Institute (VLIZ), InnovOcean Campus, Jacobsenstraat 1, 8400 Oostende, Belgium

Litter, in particular stranded plastics, is present in the environment, with known and documented negative environmental impacts (entanglement, gut blockage of aquatic biota, potential ecotoxicological effects). Litter sources can be land-based, and items are readily transported via inland waterbodies to the coast and sea. To be able to act and establish informed mitigation measures to decrease the input from land and riverine waters to the sea, local authorities require reliable and high-quality data. However, litter is a very diverse waste solid product, which is mostly (but not only) composed of plastic of different sizes, shapes, densities, sources etc. To monitor and quantify the spatial-temporal distribution of litter in the environment, experts require cost-effective approaches that can cover a diversity of environments, sampling methods and areas, and that enables an overview of litter accumulations zones. The goal of the Plastic Pirates Go Europe! in Belgium ([www.plastic-pirates.eu/dt](http://www.plastic-pirates.eu/dt)) is to set up and manage a long-term local project partnership between experts (researchers and data managers) and local schools, for riverine and coastal litter observations, and data publication. The project includes a component of teachers' training, who will lead sampling campaigns with local school students, synchronised with other European project partners, to manage data validation and submission (open access), and to coordinate local data analysis and communication tasks. The observations of the participating school groups in Plastic Pirates (2022, Pilot Phase) have led already to interesting scientific conclusions. For example, the observations in Nieuwpoort have complemented scientific ongoing projects findings by indicating accumulation zones of macro-litter in the bank of the river Ijzer, in the Nature Reserve (Natuurreservaat De Ijzermonding), which was substantial: 4.5 Kg [in 20 x 50 m] and 1.3 Kg [in 60 x 20 m]. This accumulation is of environmental concern, considering that this reserve is an important area for bird nesting, and these organisms can be particular vulnerable to litter entanglement and ingestion. The project has also an important educational component by raising awareness and promoting knowledge about plastic pollution. Schoolchildren can learn about the sources, consequences, and potential solutions to plastic litter through hands-on involvement in data collection, promoting environmental literacy and fostering a sense of responsibility and environmental stewardship among participants. The collected data, which will be made open following the FAIR (findability, accessibility, interoperability, and reusability) principles, will inform policymakers and the public about plastic pollution, promoting societal behaviours and practices that contribute to prevention of litter.

### Keywords

Plastic Pirates; Citizen Science; Macroplastic; Litter; Pollution; Data