

## Tracking marked plastic items on their journey through the Scheldt estuary, using the Permanent Belgian Acoustic Receiver Network (PBARN)

Teunkens Bert<sup>1</sup>, Maris T.<sup>1</sup>, Van Damme S.<sup>1</sup>, Blust R.<sup>2</sup> and Meire P.<sup>1</sup>

<sup>1</sup> Ecosystem Management Research Group (ECOBE), Universiteit Antwerpen (UA), Prinsstraat 13, 2000 Antwerpen, Belgium

E-mail: [bert.teunkens@uantwerpen.be](mailto:bert.teunkens@uantwerpen.be)

<sup>2</sup> Systemic Physiological and Ecotoxicological Research (SPHERE), Antwerp University, Groenenborgerlaan 171, 2020 Antwerp, Belgium

Plastic waste in coastal areas and the expanding “Plastic Soup” in our oceans are a growing threat for the marine environment. In recent years the role of rivers as a potential main contributor to marine plastic pollution has been suggested. Yet, the scale of such input remains to be systematically quantified. If high contributions can be determined, considering the vastness of oceans and seas and the great depth of some, the feasibility of projects removing plastic in rivers might be better than those in which plastic is removed from the open oceans.

Therefore, the Ecosystem Management Research Group of the University of Antwerp, is studying the potential contribution of the Scheldt river to the worldwide “Plastic Soup”. In this project the focus is on macroplastics ( $\geq 2.5\text{cm}$ ). For this fraction it is still realistic to design removal strategies in rivers, the ultimate goal of this study. From 2018 onward, samples have been taken in the river using different techniques, like: fyke nets, a fishing technique called anchor netting and a specially designed sampler. The latter is designed to study the vertical distribution of plastics in the water column. Additionally, clean up actions have been organized to study the composition of plastic waste that ends-up on riverbanks. The data collected to date has provided crucial insights, but many questions remain unanswered.

To answer such questions as: “How long does it take for plastic to end up in the North Sea?” and “What factors determine why some types of plastic or found more on riverbanks than in the river itself?”, it was decided to follow a variety of marked plastic items on their journey through the estuary of the Scheldt river.

In December 2019 and July 2020 marked plastic items, either fitted with GPS trackers or part of a Citizen Science project, were released at different location along the Maritime Scheldt. Thanks to the ‘Brilliant Marine Research Idea’ grant we were also able to equip a number of plastic items with acoustic telemetry tags, normally used to monitor the movement of fish or marine mammals. Using the Permanent Belgian Acoustic Receiver Network (PBARN) we were able to monitor the movement of submerged plastic items in a more detailed way than ever before.