OD6) A Novel Methodology to Characterize Riverine Macroplastic Emission into the Ocean in the Nakdong River Estuary

Jae-Ki Shin · Yongeun Park[1]
Korea Water Resources Corporation (K-water)
[1]School of Civil and Environmental Engineering, Konkuk University

1. Introduction

Land-based macroplastic is considered one of the major sources of marine plastic debris. However, estimations of plastic emission from the rivers into the oceans remain scarce and uncertain, mainly due to a severe lack of standardized observations. To properly assess global plastic fluxes, detailed information on spatiotemporal variation in river plastic quantities and composition are urgently needed.

2. Materials and Methods

In this conference, we present a new methodology to characterize riverine macroplastic dynamics. The proposed methodology was applied to estimate the plastic emission from the Nakdong River, Korea.

3. Results and Discussions

During the three typhoons (Lingling, Tapah and Mitag) impact periods of autumn 2019, real-time cross-sectional profiles of plastic transport were made across the river width. Simultaneously, sub-samples were taken to determine the composition, size, and weight of riverine macroplastics (>5 cm). Finally, extrapolation of the observations based on available hydrological data yielded estimates of daily, monthly and annual macroplastic emission into the ocean. Our results suggest that plastic emissions from the Nakdong River are the first estimates. Importantly, our flexible methodology can be adapted to local hydrological circumstances and data availability, thus enabling a consistent characterization of macroplastic dynamics in rivers worldwide. Such data will provide crucial knowledge for the optimization of future mediation and recycling efforts.