

Rapid Assessment of Floating Macroplastic Transport in the Rhine

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Goals of this study:

1. Demonstrate the application of **visual and passive macroplastic quantification** methods to a major river in a **limited timeframe**
2. **Estimate macroplastic transport** from the Rhine to the North Sea
3. **Provide an outlook** to future plastic long-term monitoring in rivers.

Take home message:

Proof of concept of altered monitoring method, results show relatively low mass transport of floating macroplastic in the Rhine.

DOI: <https://doi.org/10.3389/fmars.2020.00010>

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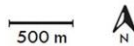


Methods



1. Visual Counting
Location: Erasmusbrug
2. Shoreliner
Location: Lekhaven

Rotterdam



Combining visual observations of macroplastic at the Erasmusbrug (bridge) in Rotterdam with **plastic statistics** from litter gathered **through passive sampling** by the Shoreliner, using the following formula:

$$M_p = p \cdot m_p$$

With:

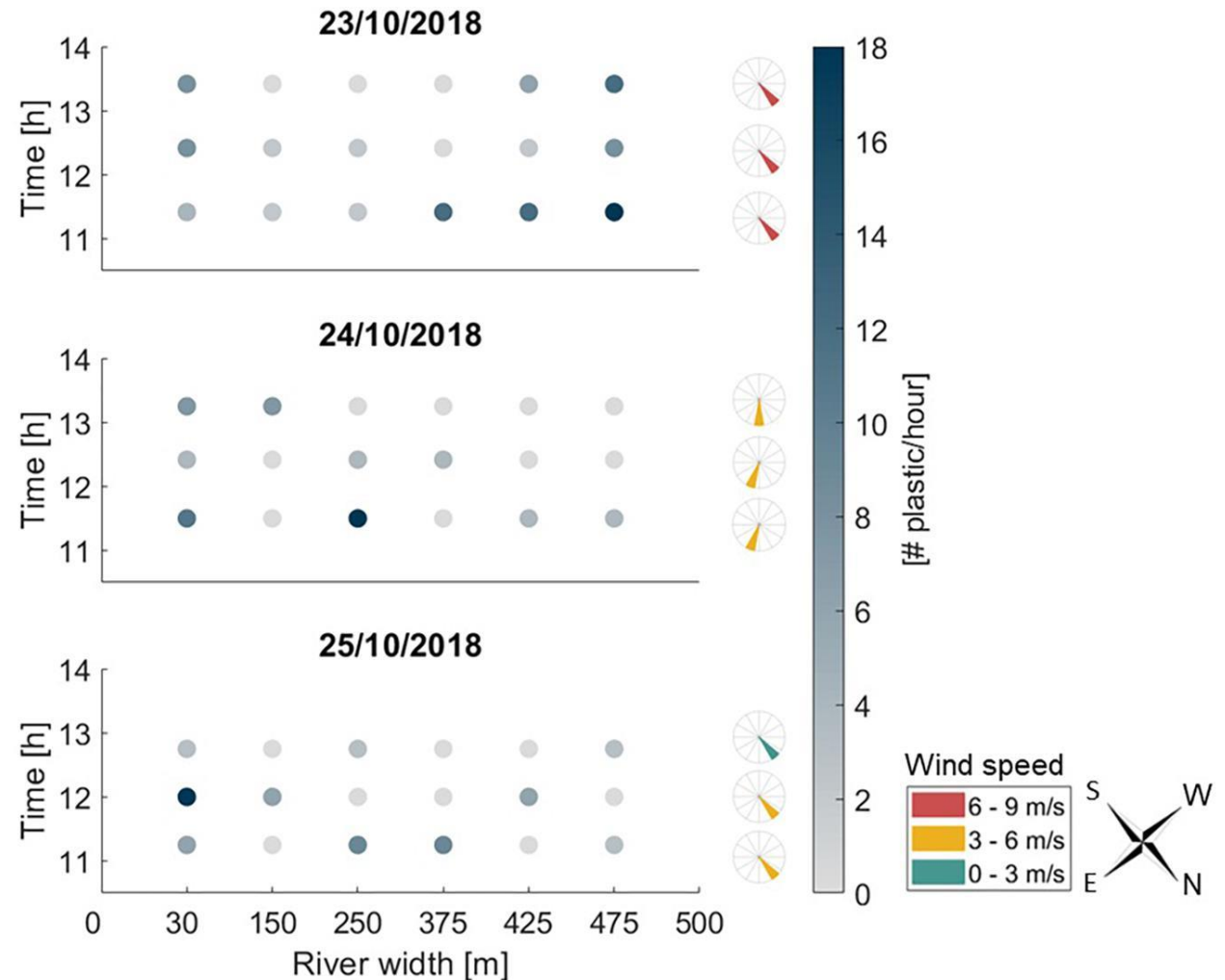
M_p = floating macroplastic transport [kg/h]

P = mean plastic transport [items/hour]

m_p = mean mass per plastic item [kg/item]

Results: Horizontal Distribution

- Plastic flux between **10-75 items/hour**
- Location of plastic **fluctuated**, likely due to wind and navigation activities
- Mean macroplastic **transport of 1.3-9.7 kg/day** (Median 5.8 kg/day)
- Observations performed in **low discharge** (October). Higher transport expected with higher discharge



Results: Plastic Composition

- Average mass per item: **5.38 g**
- **Polyolefin** (PO, aggregated term for both PE and PP) most abundant plastic
- Soft PO counted most often
- Hard PO contributing most to total mass

