Plastic Collection in the South Baltic Sea Region - Rostock, Germany

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Introduction

- Approximately 10 million tons of plastic waste end up in oceans annually[1]
- Total ocean plastic estimated at 86 million tons[2]
- Ocean-bound plastic (OBP): Plastic waste at risk of entering oceans through rivers and waterways[3]
- OBP is transported by natural forces (wind, rain, water flow, tides) and human activities (littering)[4]
- Knowledge gaps remain regarding exact sources and pathways of plastic pollution

Circular Ocean-bound Plastic (COP) Project

- Interreg South Baltic funded project focusing on OBP in waterways
- Primarily examines macro litter (>2.5 cm) in tributaries leading to the Baltic Sea
- Three pilot areas established to test initiatives and technologies for OBP removal
- Focus on prevention at source rather than post-pollution collection

Pilot Area: Rostock, Germany

- Largest city in Mecklenburg-Western Pomerania (>200,000 inhabitants)
- Warnow river widens up to 3600m as it approaches Rostock, creating an estuary
- Low flow velocities (<0.1 m/s) with wind-influenced current direction changes

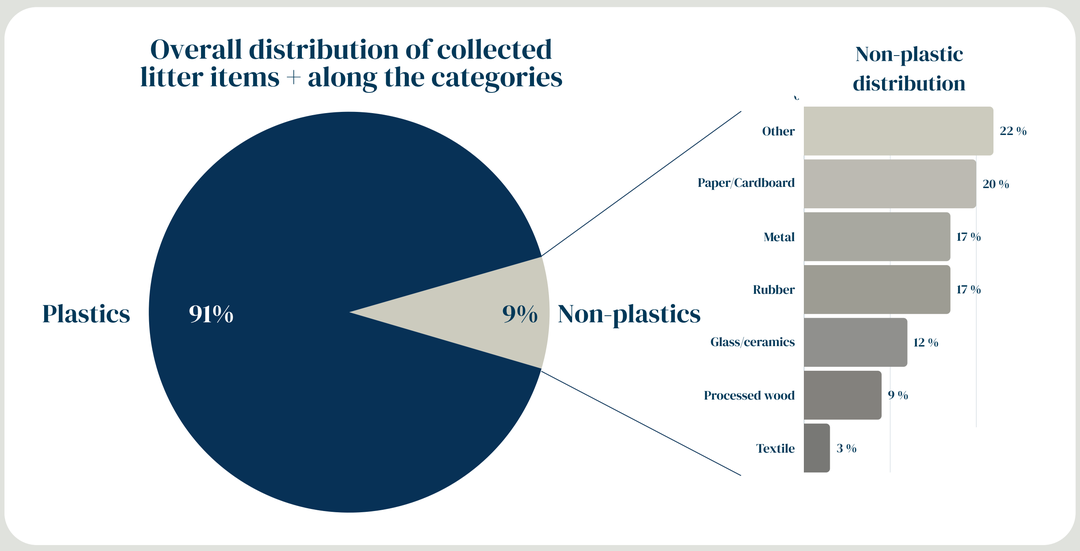
Collection Methodology

- PortBins (by SpillTech) selected for Rostock conditions
- Three units installed in spring 2024
- Components: collection container with underwater pump powered by electric engine
- Designed to collect litter from water surface and upper water layers
- Strategic placement based on flow characteristics, litter hotspots, ease of emptying, and energy access

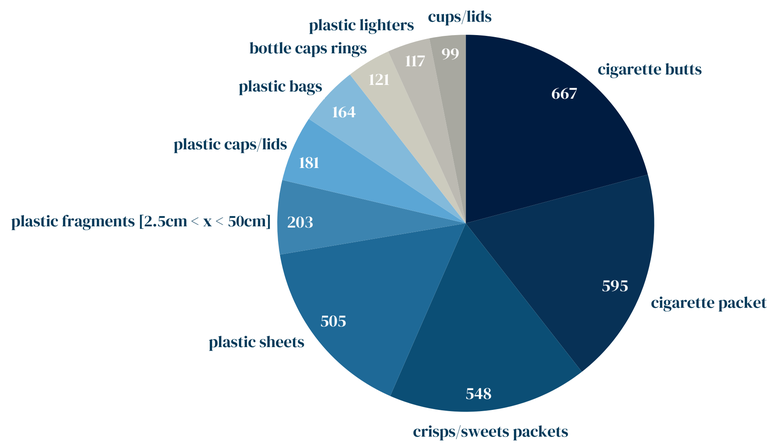
Results

Material Distribution

- Plastic constituted 91% of all collected waste materials



Top 10 Litter Items



- Top 10 litter items comprised 81% of all identified litter
- 8 of 10 top categories directly linked to human consumption (eating, drinking, smoking)
- Plastic sheets and fragments among most common items

Key Findings

- Human consumption of food and beverages in the port area is a significant source of river waste
- Weather events (heavy rain, wind) showed no direct correlation with OBP pollution levels
- Local events significantly impact litter numbers (e.g., Hanse Sail increased litter by factor of 4)

Conclusions & Recommendations

- Targeted prevention strategies should focus on consumption-related plastic waste
- Event management requires special attention to waste prevention
- PortBins provide effective tools for collection of litter in urban waterways
- Further research needed on seasonal variations and long-term effectiveness

Acknowledgments:
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