

Large micro-, meso-, and macro-plastics distribution in the Bahía Blanca Estuary wetlands: variations across and within salt marshes

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INTRODUCTION

Bahía Blanca estuary salt marshes are intertidal wetlands in Argentina providing many ecosystem services and exposed to intense anthropogenic pressure, highlighting plastic pollution.

Our goal was to analyze the abundance, size, type, color and polymeric composition of plastics of 1-100 mm in size (large micro-, meso-, and macro-plastics) in the Bahía Blanca Estuary salt marshes.

MATERIAL & METHODS

Plastics from mudflat and low- and high-salt marsh sediments, and plant-litter from the storm line were isolated by wet sieving and flotation with NaCl saturated solution. The shape, size and color were determined under a stereomicroscope and the polymeric composition was determined by FTIR-ATR

RESULTS



Fig. 1. Sampling site location in Bahía Blanca Estuary

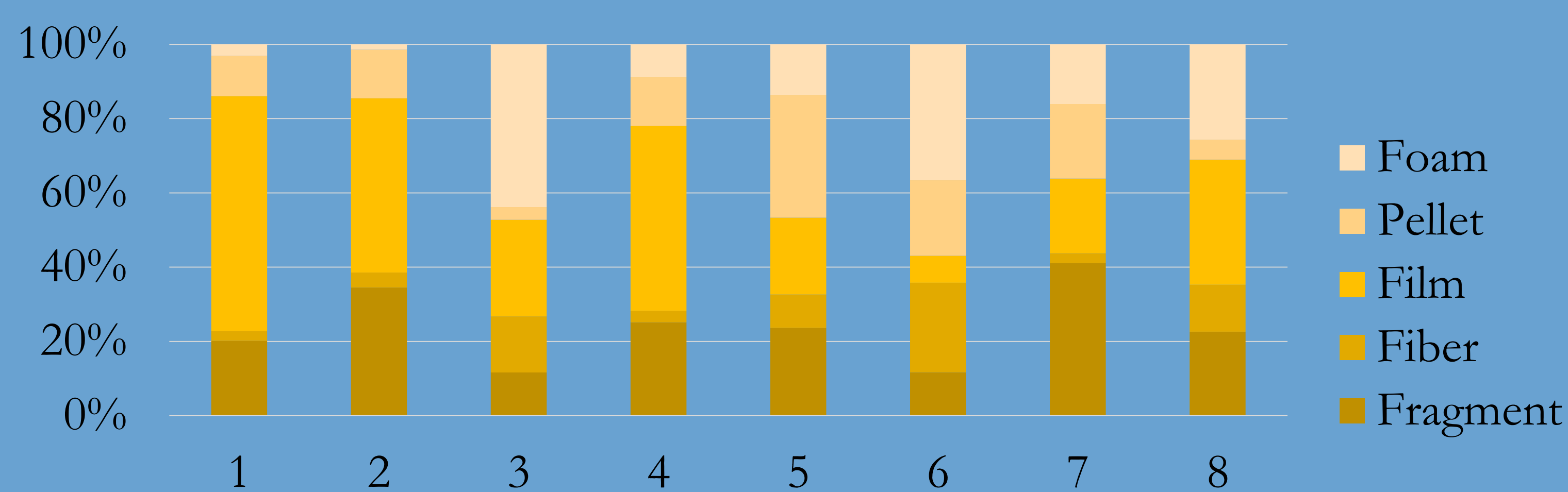


Fig. 3. Percentage of different types of plastics found in storm line plant debris. The number indicates the sampling site.

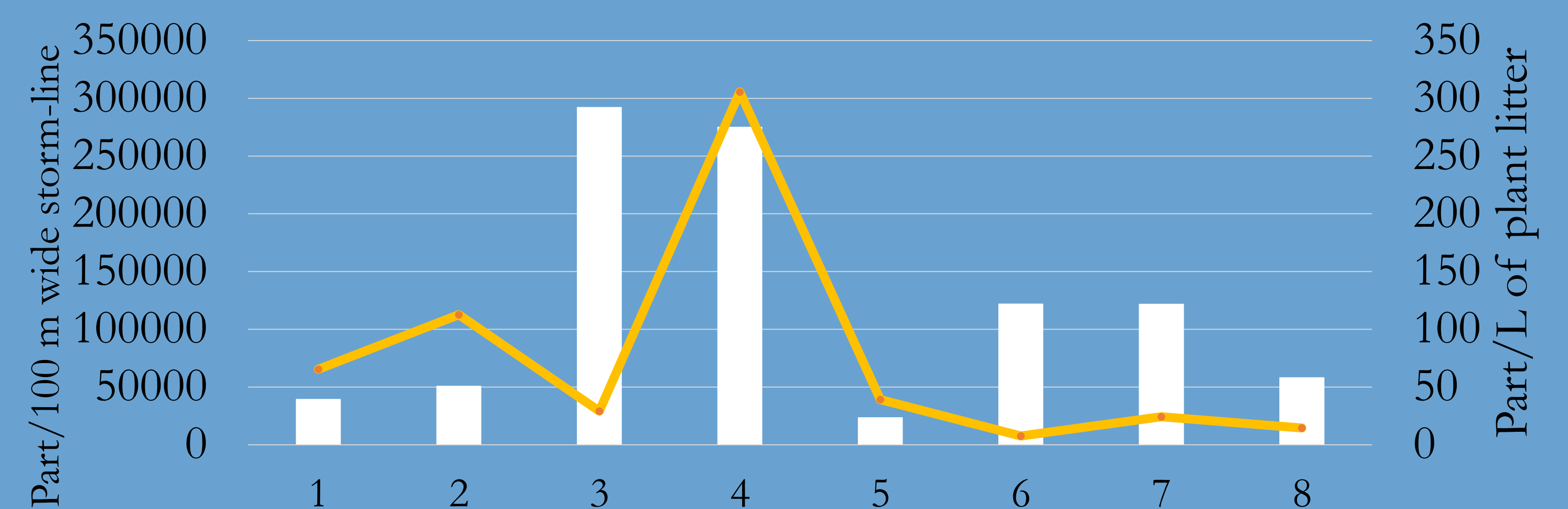


Fig. 2. Graph showing the dilution process of plastic pollution in coastal wetland storm-line by the plant litter accumulation. It shows the total number of particles in plant litter in 100 m wide storm-line (■) and the number of particles in 1 L of plant litter (—). The number indicates the sampling site.

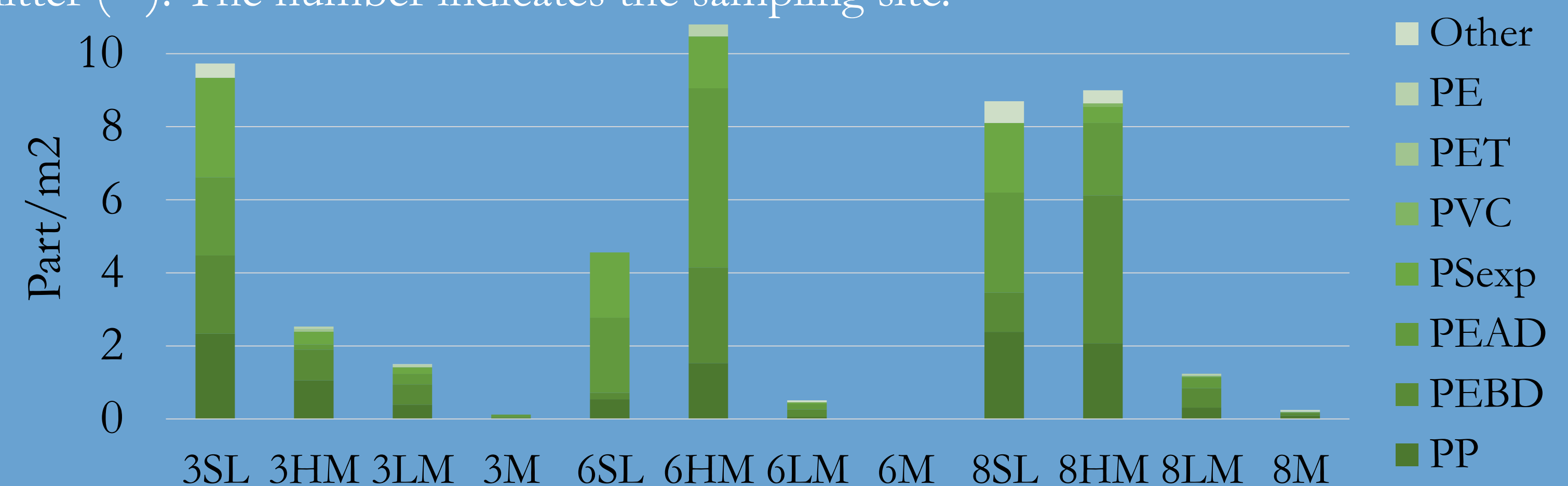


Fig. 4. Abundance and polymer composition of plastic in different parts of the salt marshes: plant litter in storm-line (SL); High salt-marsh (HM); Low salt-marsh (LM); and Mudflat (M). The number indicates the sampling site.

The inter-salt marsh variation of the abundance, type and polymeric composition of plastics was explained by the proximity to sources of contamination (e.g., garbage dumps and industrial, sewage and rivers discharges) (Figs. 2 and 3).

While the intra-salt marsh variation was mainly explained by the topography (Fig. 4).

For environmental remediation, the removal of plastics from the storm line at sites 3 and 4 (Maldonado Creek, and Brown Landfill) would be the most appropriate intervention according to the cost-benefit ratio (Fig. 2 and 4).

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