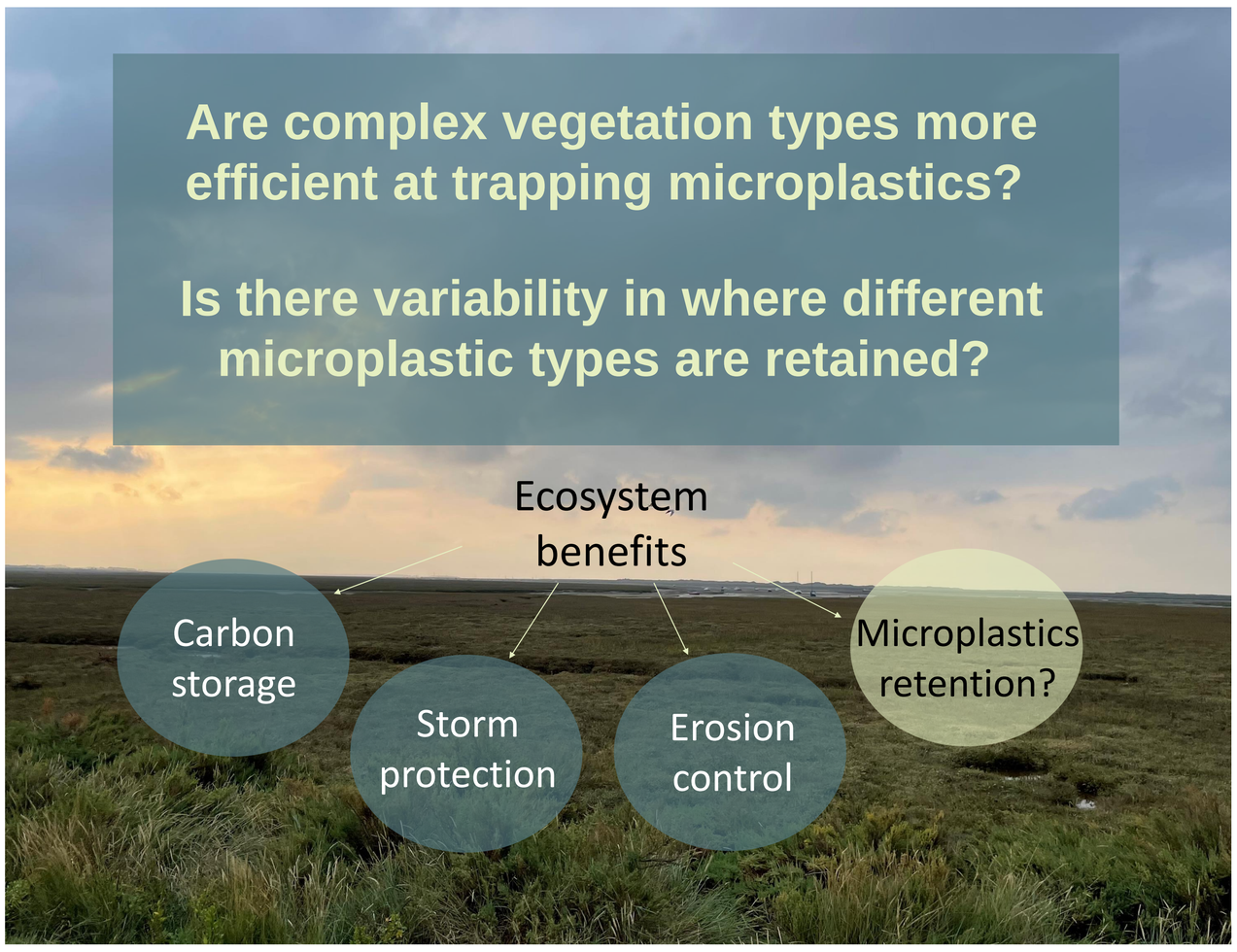
A plastic trap? Factors influencing microplastics retention in coastal vegetated habitats

Hayley McIlwraith[1,2], Penelope Lindeque[1], Anastasia Miliou[3], Trevor Tolhurst[2], Matthew Cole[1]

[1] Plymouth Marine Laboratory, Prospect Place, Plymouth PL1 3DH, UK
[2] University of East Anglia, School of Environmental Sciences, Norwich Research Park, Norwich NR4 7TJ
[3] Archipelagos Institute of Marine Conservation, Pythagorio, Samos, Greece

Are complex vegetation types more efficient at trapping microplastics?

Is there variability in where different microplastic types are retained?



Methods

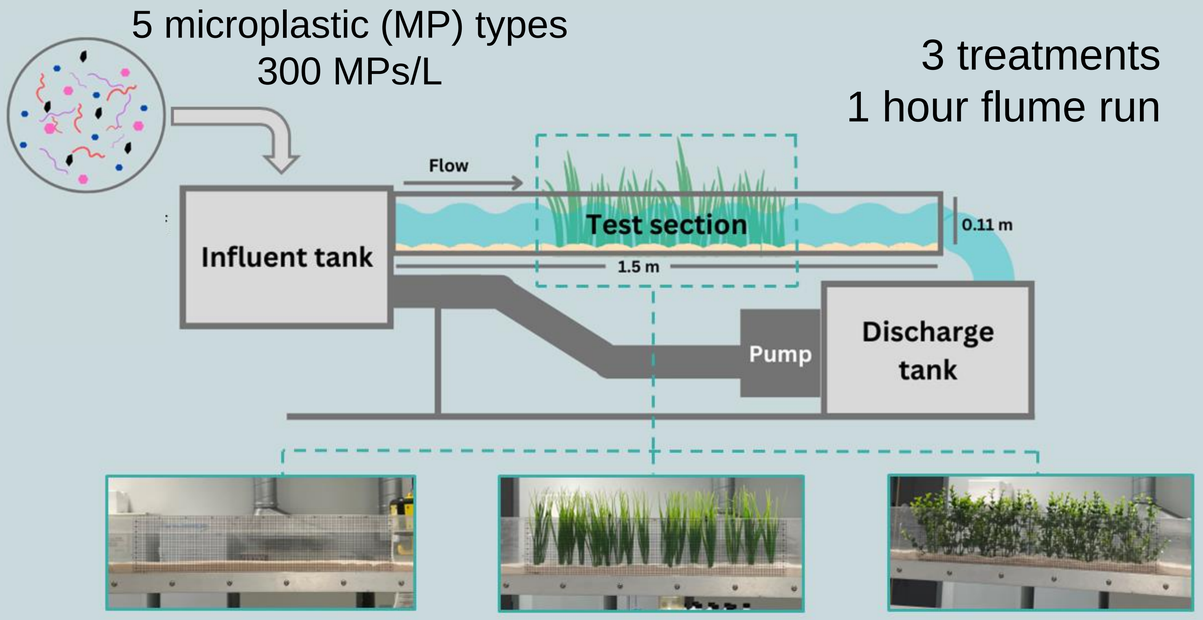


Figure 1. Flume tank experimental set-up with three treatments, from left to right, flat sand, grassy vegetation, and branched vegetation.

Preliminary Results

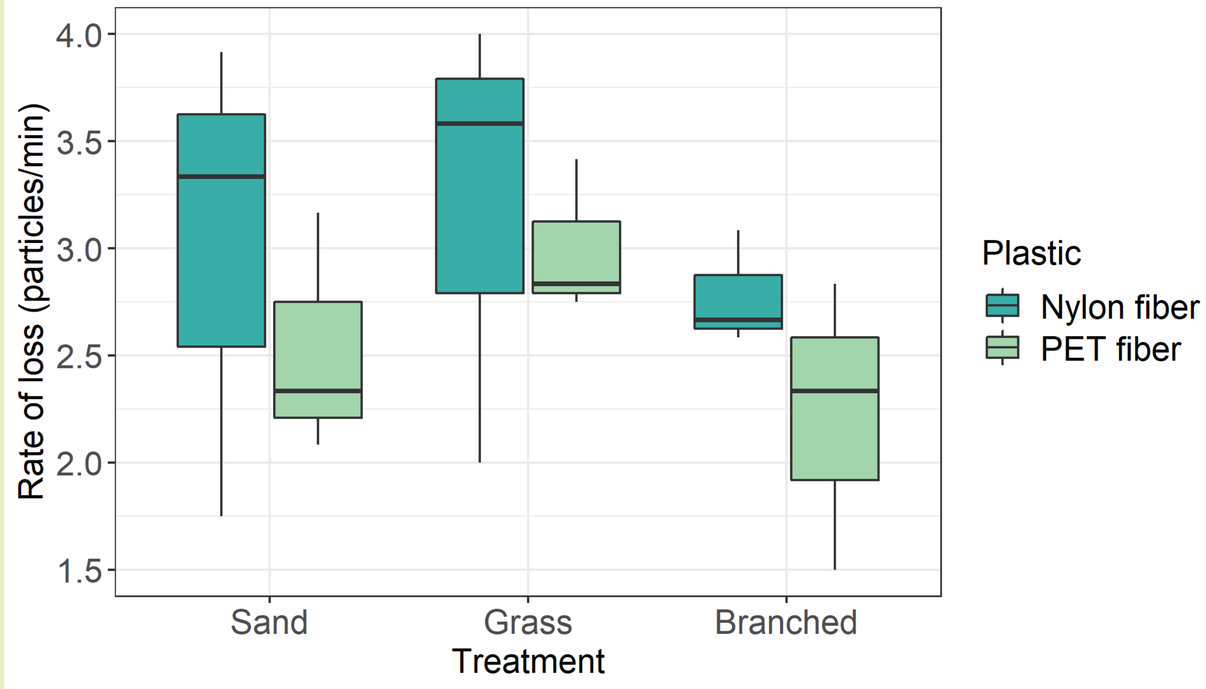


Figure 2. Rate of particle loss from the water column for two plastic types and each vegetation treatment.

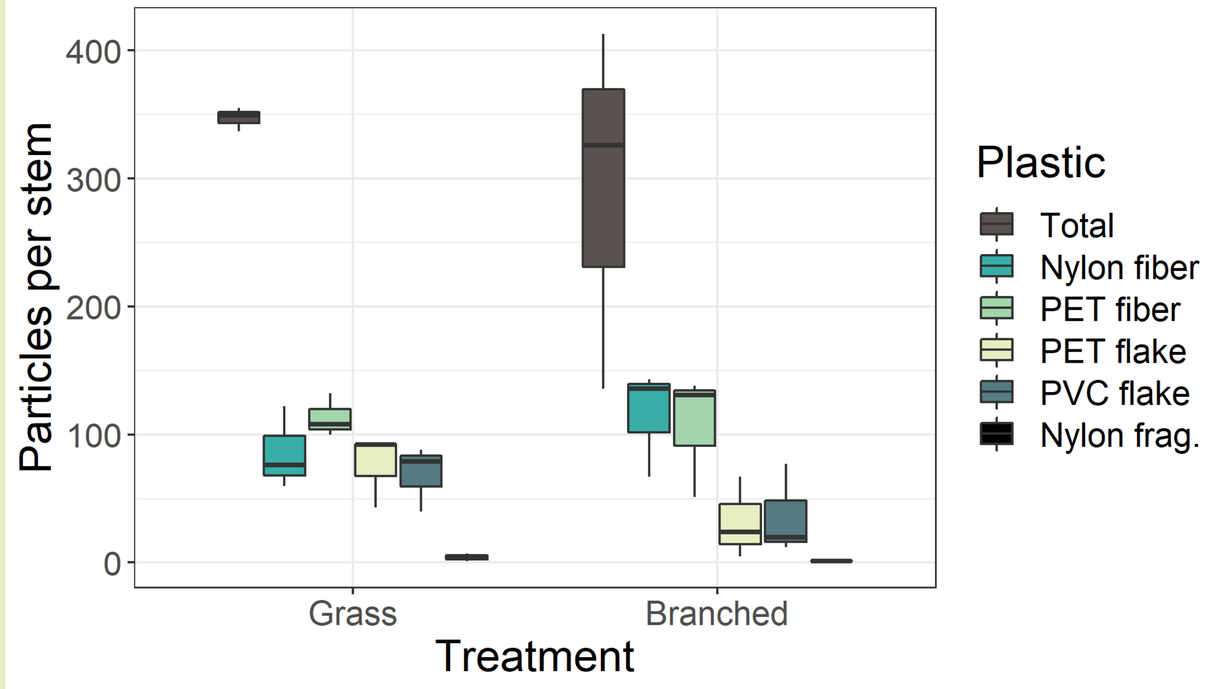


Figure 3. Number of microplastics per plant stem (n = 3) for grass and branched treatments, split by plastic type.

- In all treatments, plastic fibres settled continuously throughout the hour.
- The rate of particle loss from the water column for sand, grass, and branched treatments were 5.5 ± 0.9, 6.2 ± 0.7, 5.0 ± 0.5 particles min^{-1}, respectively (Fig. 2, $p > 0.05$, n.s.).
- Fibres were mainly found in the water column and adhered to vegetation (Fig. 2 & 3). Flakes and fragments were found on vegetation (Fig. 3) and deposited on sediment (results in progress).

Next Steps…

- Quantify microplastics in sediment and evaluate accumulation patterns. Where are plastics settling?
- Repeat with more environmentally realistic conditions using a larger flume with live plants.

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PML Plymouth Marine Laboratory
UEA University of East Anglia
UKRI Natural Environment Research Council
Archipelagos Institute of Marine Conservation
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