

Listen to the ocean

## Witches Britches and Mermaids Tears: Plastic Pollution Research.

Pennie Lindeque





## Plastic:

- > 300 million tonnes produced/year
- Great benefit to society
- But creates litter

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“Witches Britches”





- Large plastic litter is a problem
- Of equal concern is the smaller, microscopic size fraction of plastic.
- Microplastics

**“estimated that at least 5.25 trillion plastic particles are currently floating at sea”**

*Eriksen et al. (2014) PlosONE*



**“Mermaids Tears”**



- Microplastic in the marine environment is highly topical.
- Appetite to reduce microplastic pollution evident
- Better understanding of the source, distribution, accumulation, fate and risk.







Sarah  
Nelms

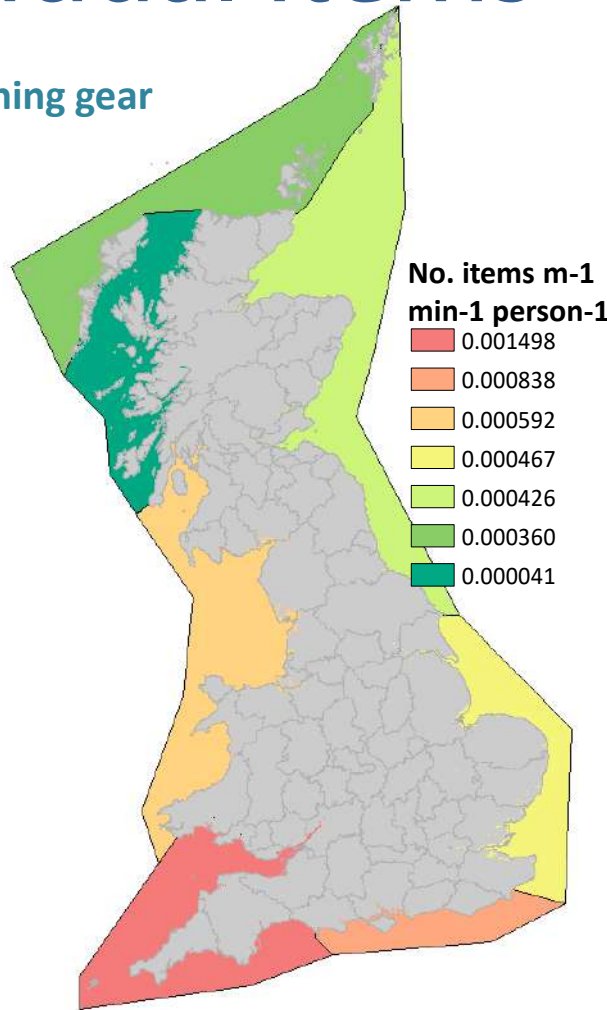
# Marine litter on British beaches: a 10-year assessment using citizen- science data

**Sarah Nelms**, Charlotte Coombes, Laura Foster, Tamara Galloway,  
Brendan Godley, Penelope Lindeque, Matthew Witt

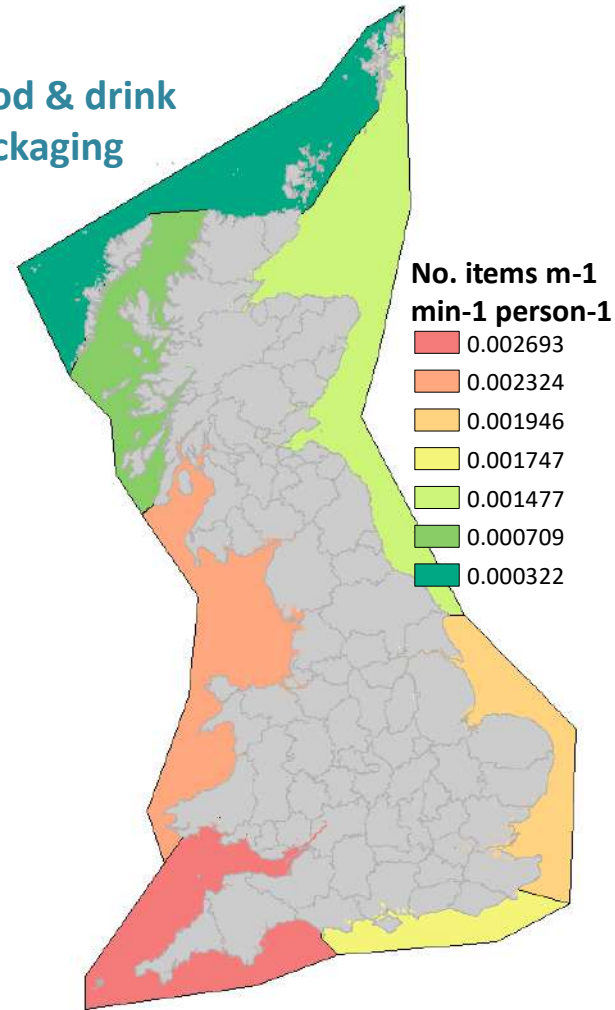


# Results: Most polluted regions - Individual items

Fishing gear



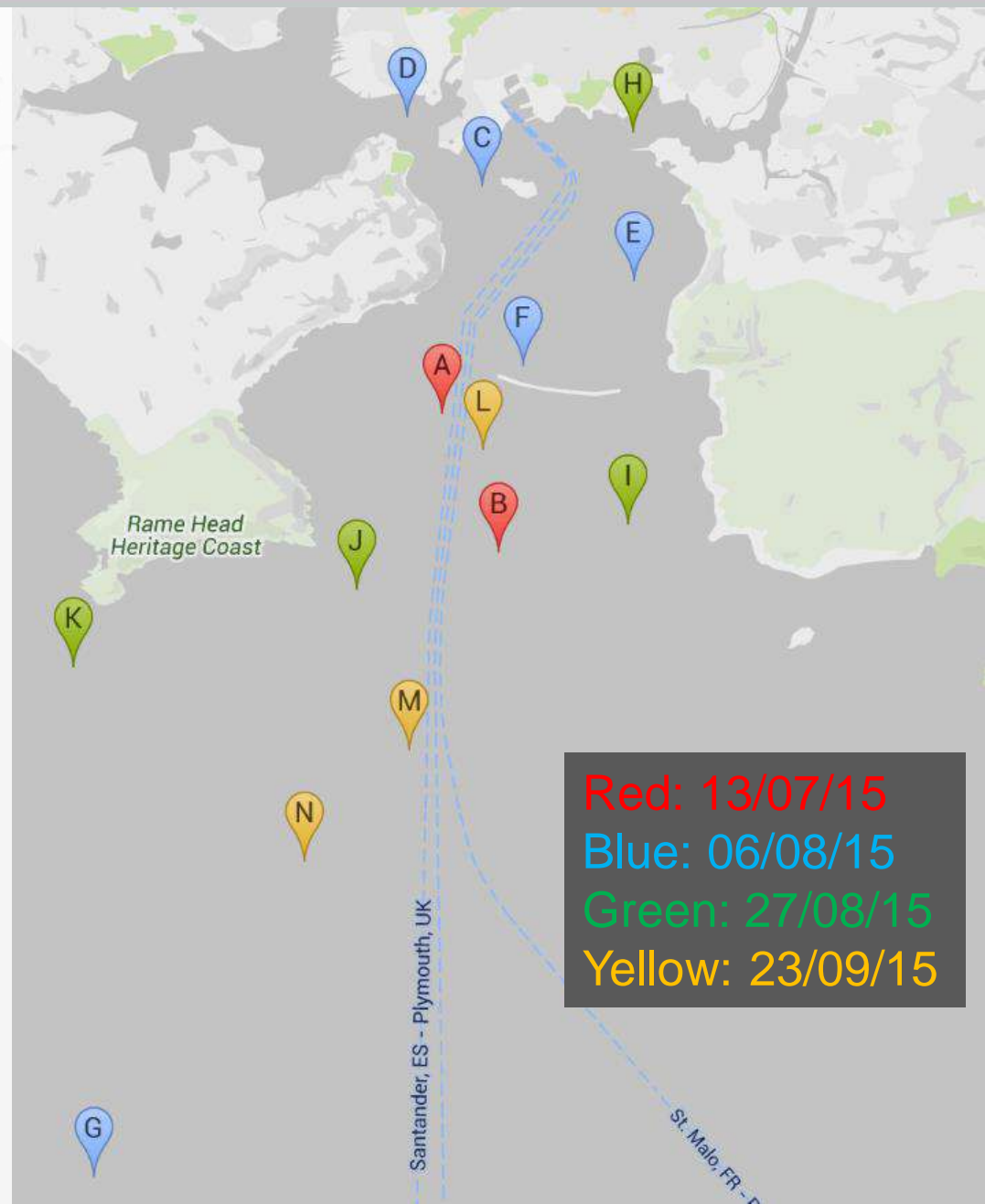
Food & drink packaging

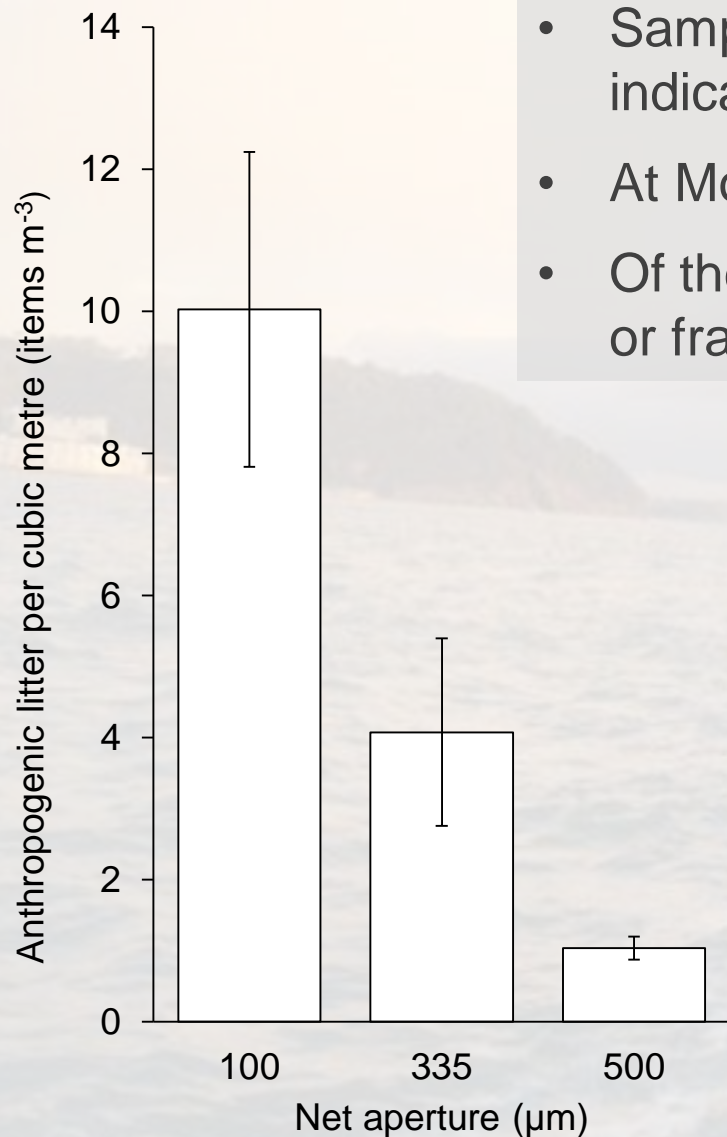


**Nelms, SE; Coombes, C; Foster, LC; Godley, BJ; Galloway, TSG; Lindeque, PK; Witt, MJ. 2017**  
Marine anthropogenic litter on British beaches: a 10-year nationwide assessment using citizen science data. STOTEN

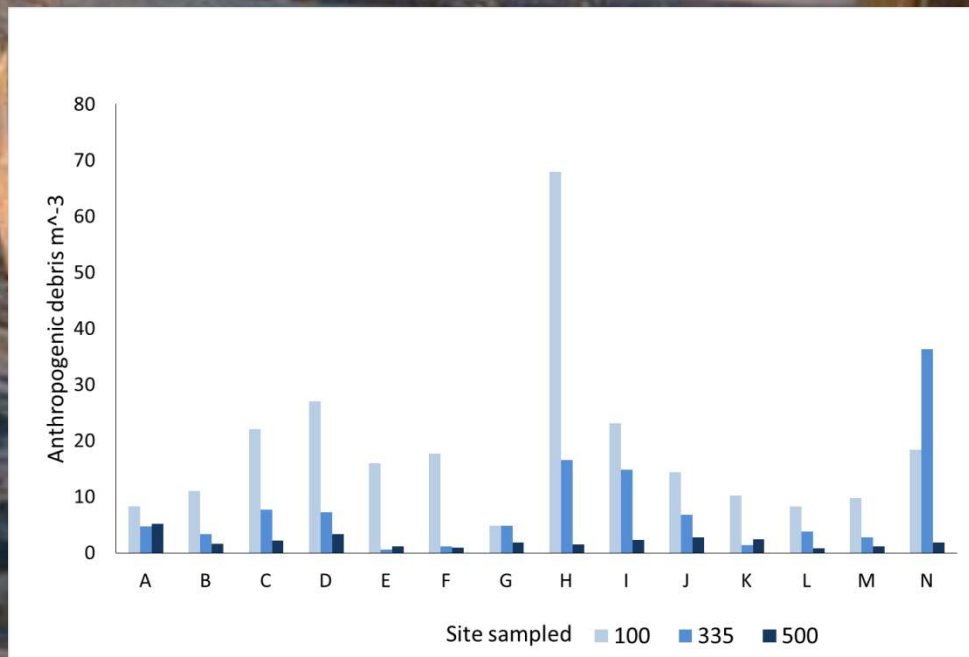
## Assessment of microplastics in the coastal waters off Plymouth

- 14 sites sampled
- 500, 335 and 100 $\mu$ m nets





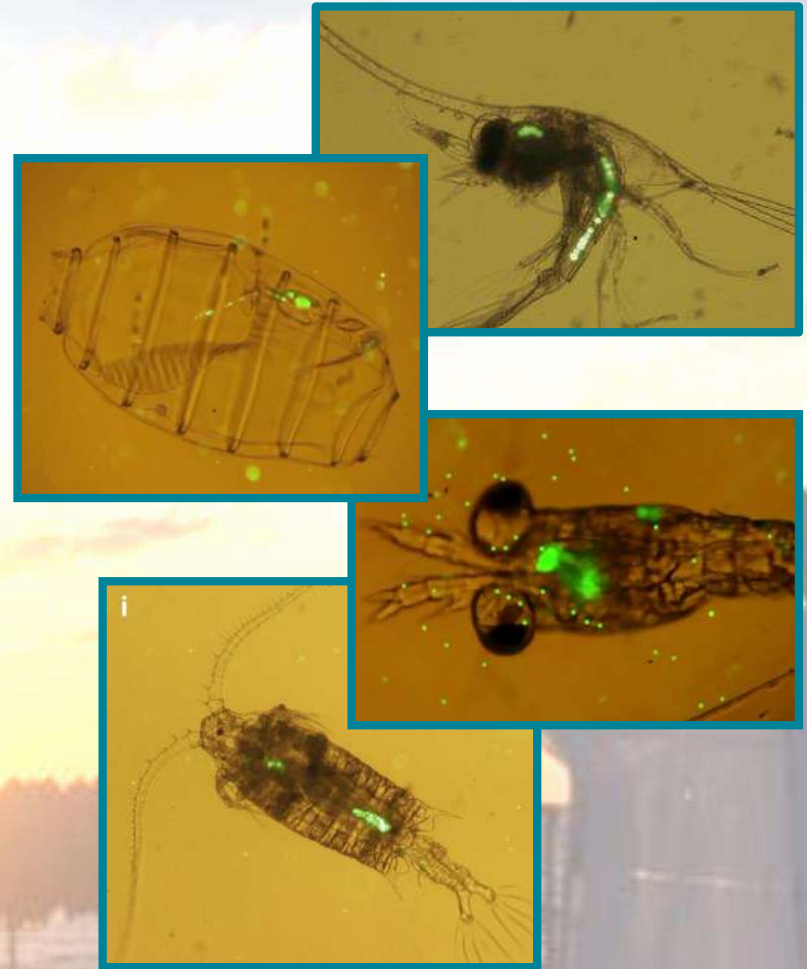
- Sampling with a smaller mesh gives a better indication of microplastic budget
- At Mouth of Plym, >15,000 fibres found m<sup>-3</sup>
- Of these plastics, the majority were fibres (77 %) or fragments (18 %), with beads contributing 4 %.

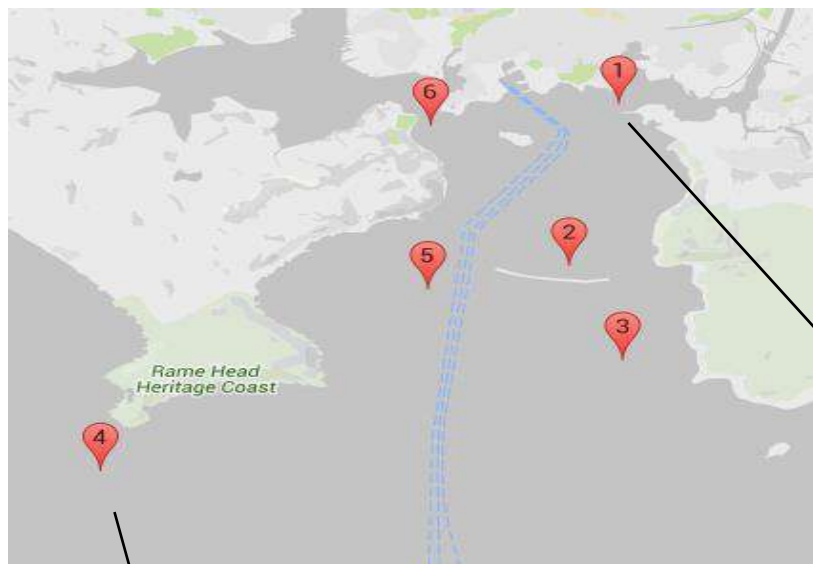




# Microplastic ingestion by zooplankton: what we know

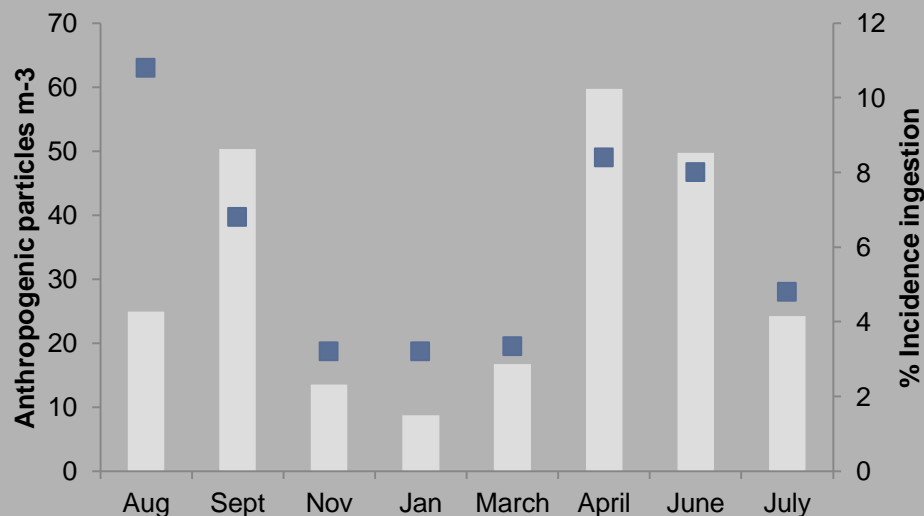
- Occurs in a range of taxa under laboratory conditions
- Significantly reduces algal feeding in many groups
- Negatively affects health



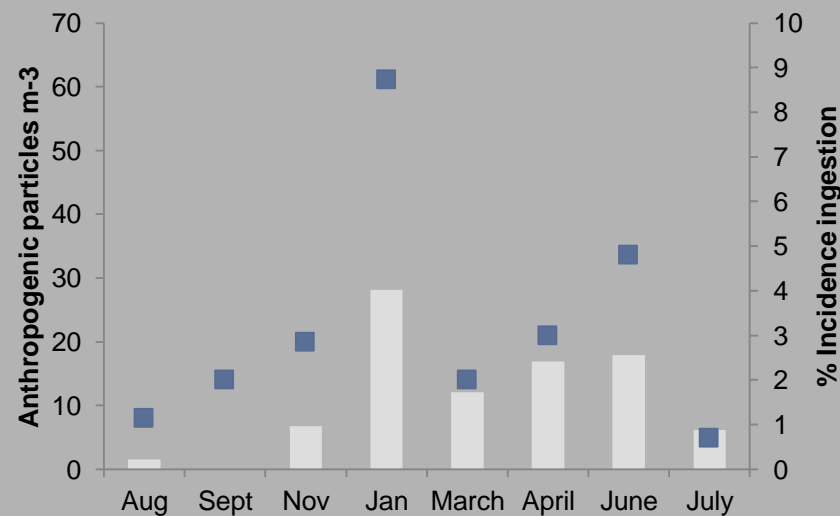


- Relative abundance of microplastic ranges from 0.33 – 240 MP per 100 zooplankton

## Rame Vertical

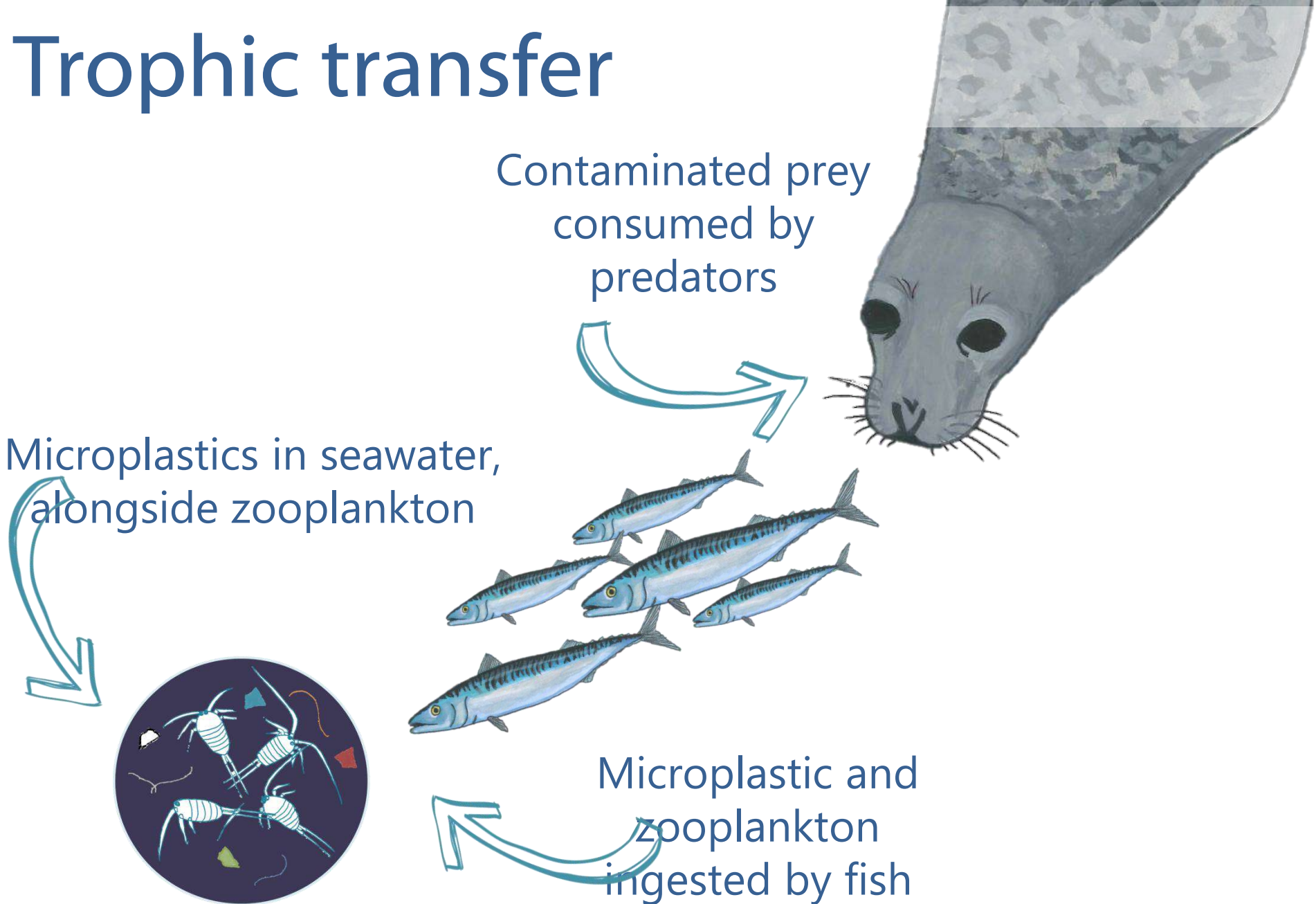


## Mouth of Plym





# Trophic transfer



**Nelms, SE;** Galloway, TSG; Godley, BJ; Jarvis, DS; **Lindeque, PK.** 2018 Investigating microplastic trophic transfer in marine top predators. Environmental Pollution.

## Team Microplastic @ PML



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[http://www.pml.ac.uk/Research/Research\\_topics/Facing\\_the\\_challenge\\_of\\_new\\_pollutants/Marine\\_plastics](http://www.pml.ac.uk/Research/Research_topics/Facing_the_challenge_of_new_pollutants/Marine_plastics)

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