

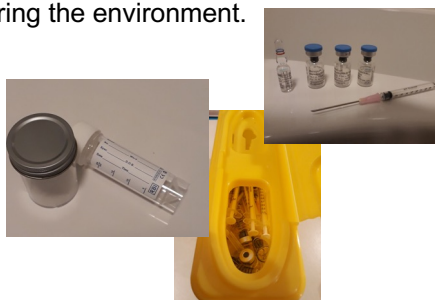
Microplastics in New Zealand's Ecosystems: the levels, the impacts and the potential solutions

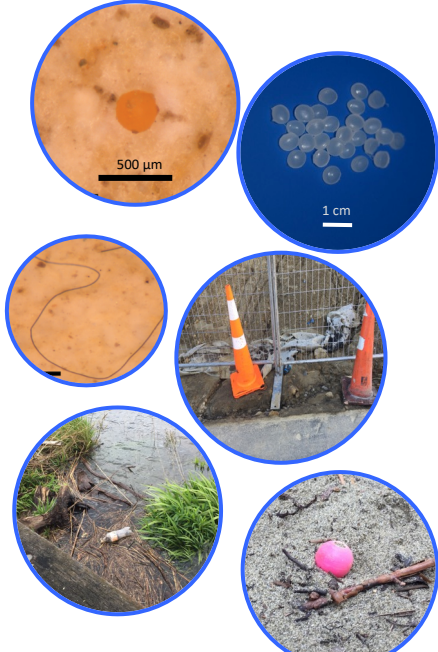
Olga Pantos
09/04/18




Plastics in our environment

- Estimated *311 million tonnes* of plastic items were produced in 2014.
- Expected to increase to *33 billion tonnes* by 2050.
- Majority is single-use plastics. E.g. bottles, bags.
- Only 9% globally is recycled – value depends on crude oil.
- Majority ends up in landfill, or entering the environment.
- Not just single-use plastics.
- Pervasive in the environment.
- Earth, water and air all affected.







Types:

- ◆ 100 µm – 5 mm
- ◆ 1^o microplastics
 - ◆ Made for purpose: e.g. microbeads
- ◆ 2^o microplastics
 - ◆ Breakdown products of larger plastic items
 - ◆ fibres – nets/clothes
 - ◆ fragments of larger items
- ◆ Continued breakdown into nanoplastics

Ocean plastics





RESEARCH ARTICLE

Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea

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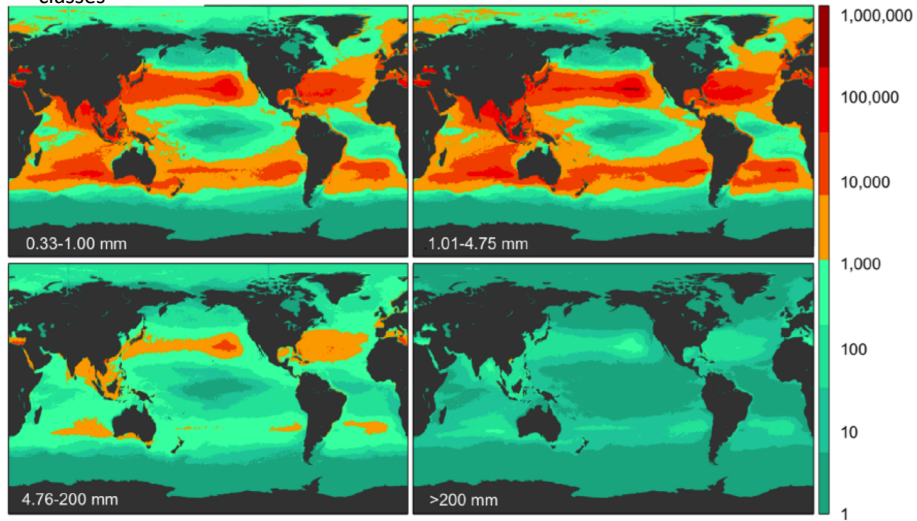
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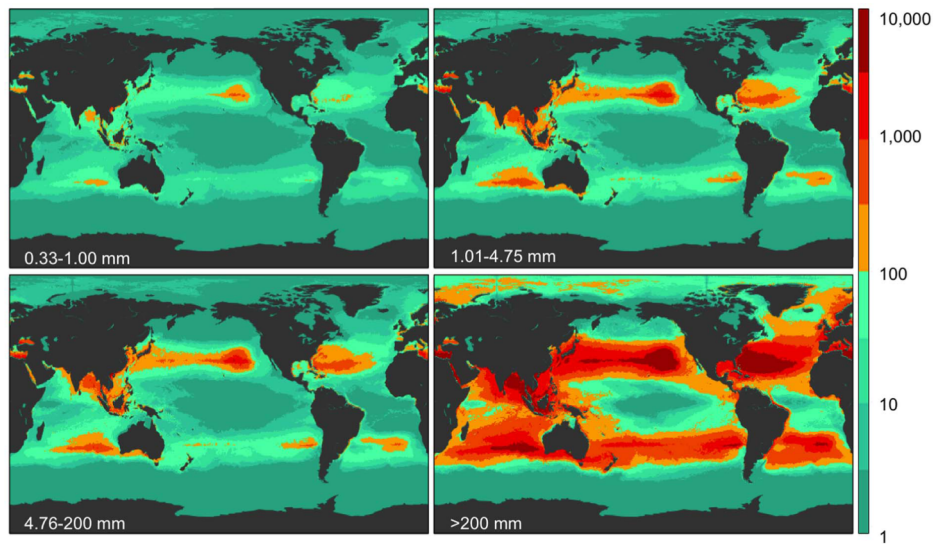
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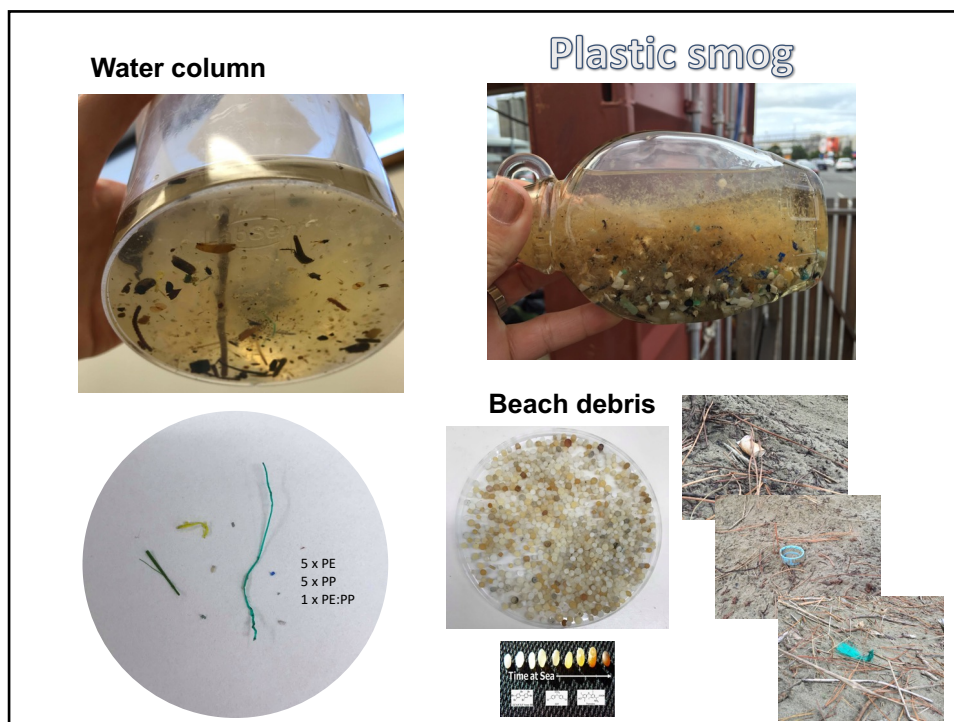
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Model prediction of global count densities (pieces km^{-2}) for 4 size classes

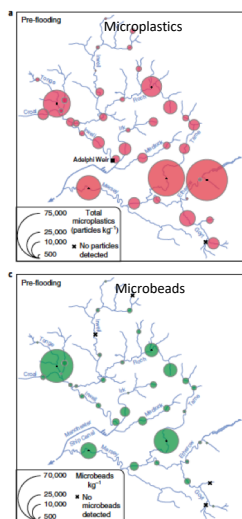


Model prediction of global weight densities (g km^{-2}) for 4 size classes

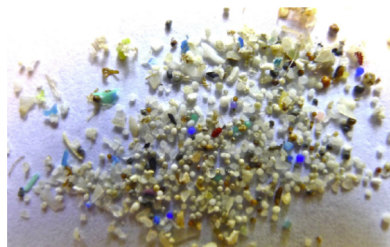




Freshwater microplastics



Greater Manchester streams (UK)
Hurley et al., 2018



Great Lakes, USA/Canada.
Eriksen et al., 2013

Origin/route:

- Land run-off
- Wastewater effluent and biosolids

Impacts



- ◆ Reduced biomass
- ◆ Endocrine disruption
- ◆ Physical damage
- ◆ Accumulation and concentration of other chemicals
- ◆ Facilitate uptake of chemical contaminants
- ◆ Ecosystem disruption e.g. loss of key species
- ◆ Bioaccumulation of chemicals and trophic transfer

Impacts

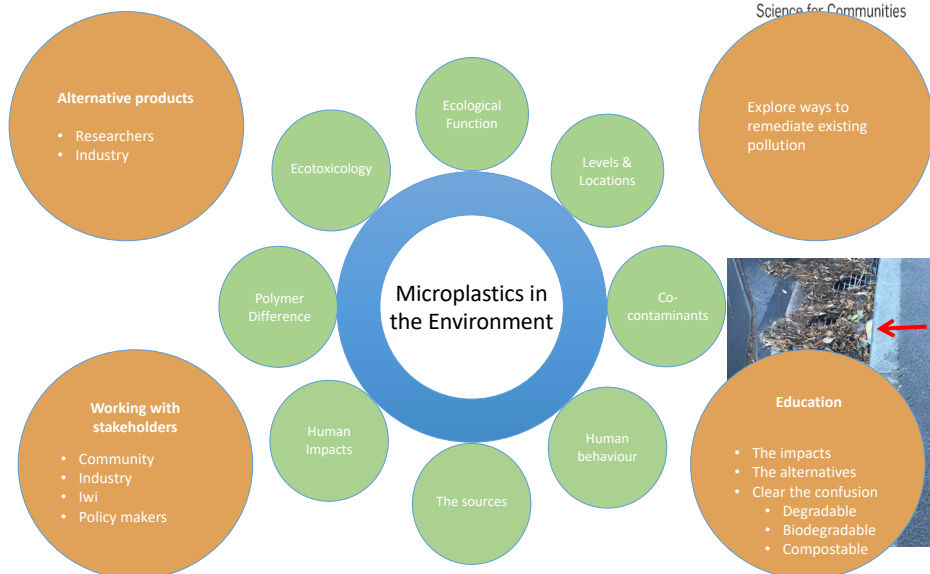


Economic Implications

- ◆ Productivity
 - ◆ growth efficiency
 - ◆ reproduction
- ◆ Biosecurity risks
- ◆ Food safety: human health risk
- ◆ Trade barriers



Addressing this 'wicked problem'



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