

# Plastic and microplastic pollution

Bjørn Einar Grøsvik



# The plastic whale.. a game changer..

## A whale is found dead with more than 30 PLASTIC BAGS in its stomach – and experts say it's 'not surprising'

- The whale had been put down by wardens off the coast of western Norway
- Researchers dissected its stomach and found huge amounts of plastic
- The whale was also emaciated with little blubber suggesting it was malnourished

By SHIVALI BEST FOR MAILONLINE

PUBLISHED: 17:21 GMT, 2 February 2017 | UPDATED: 21:17 GMT, 2 February 2017



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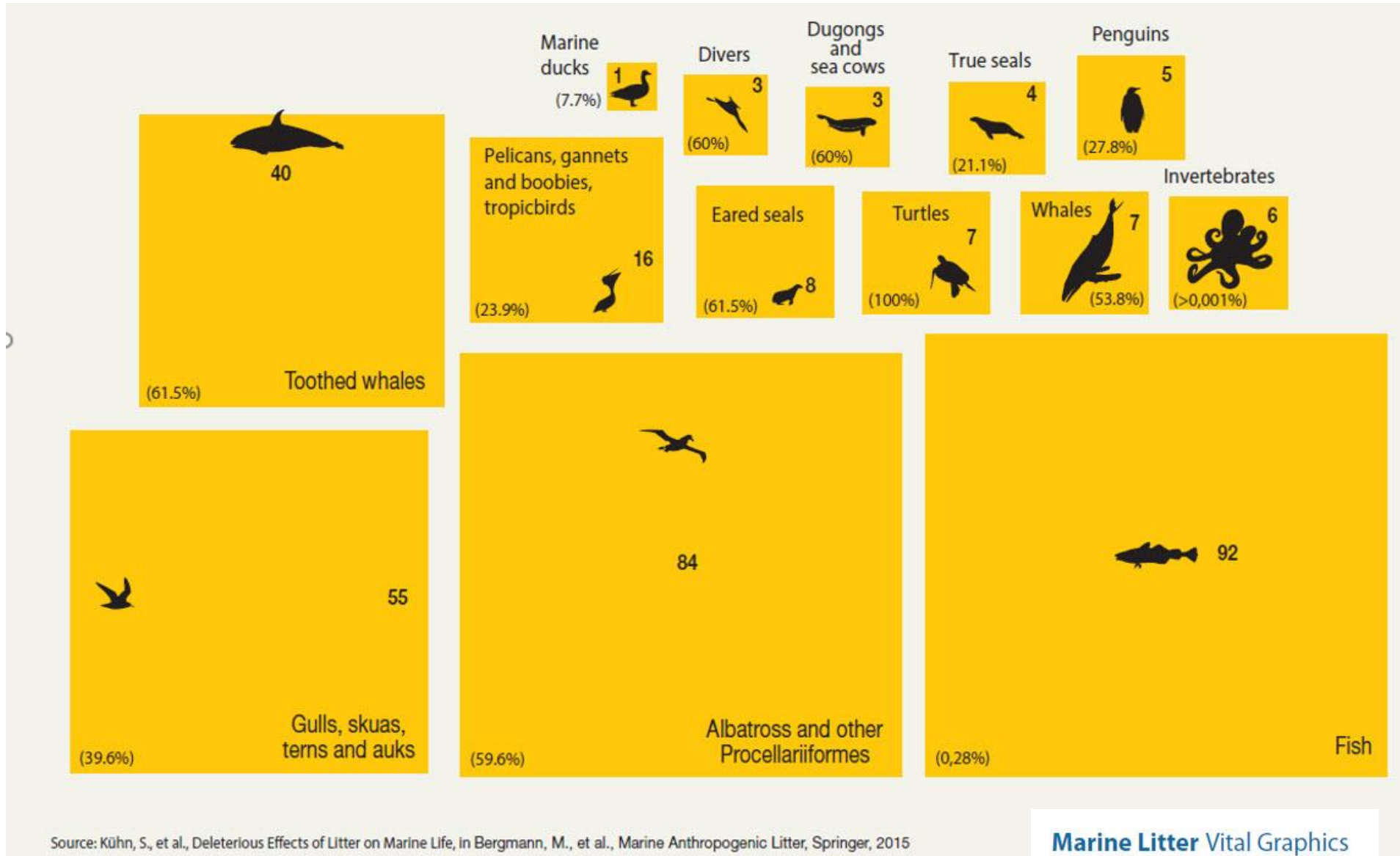
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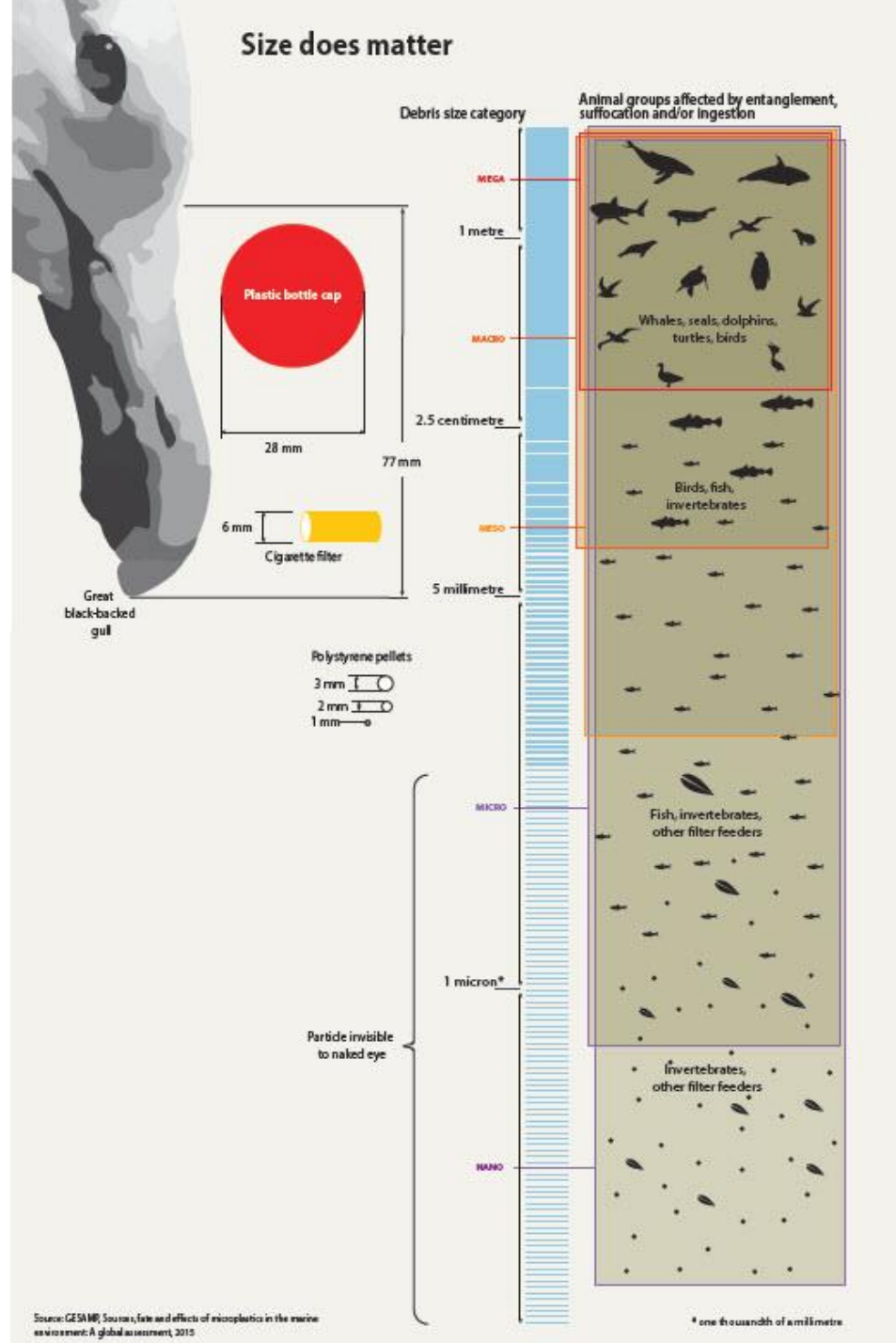
Runde 2016. Photo: Jan Helge Fosså

# Different animal groups mistake plastic for food



Macro  
Micro  
Nano..

Different polymers  
Shape (pellets, flakes, fibers)  
Additives  
Adsorbents (POPs)



Effects

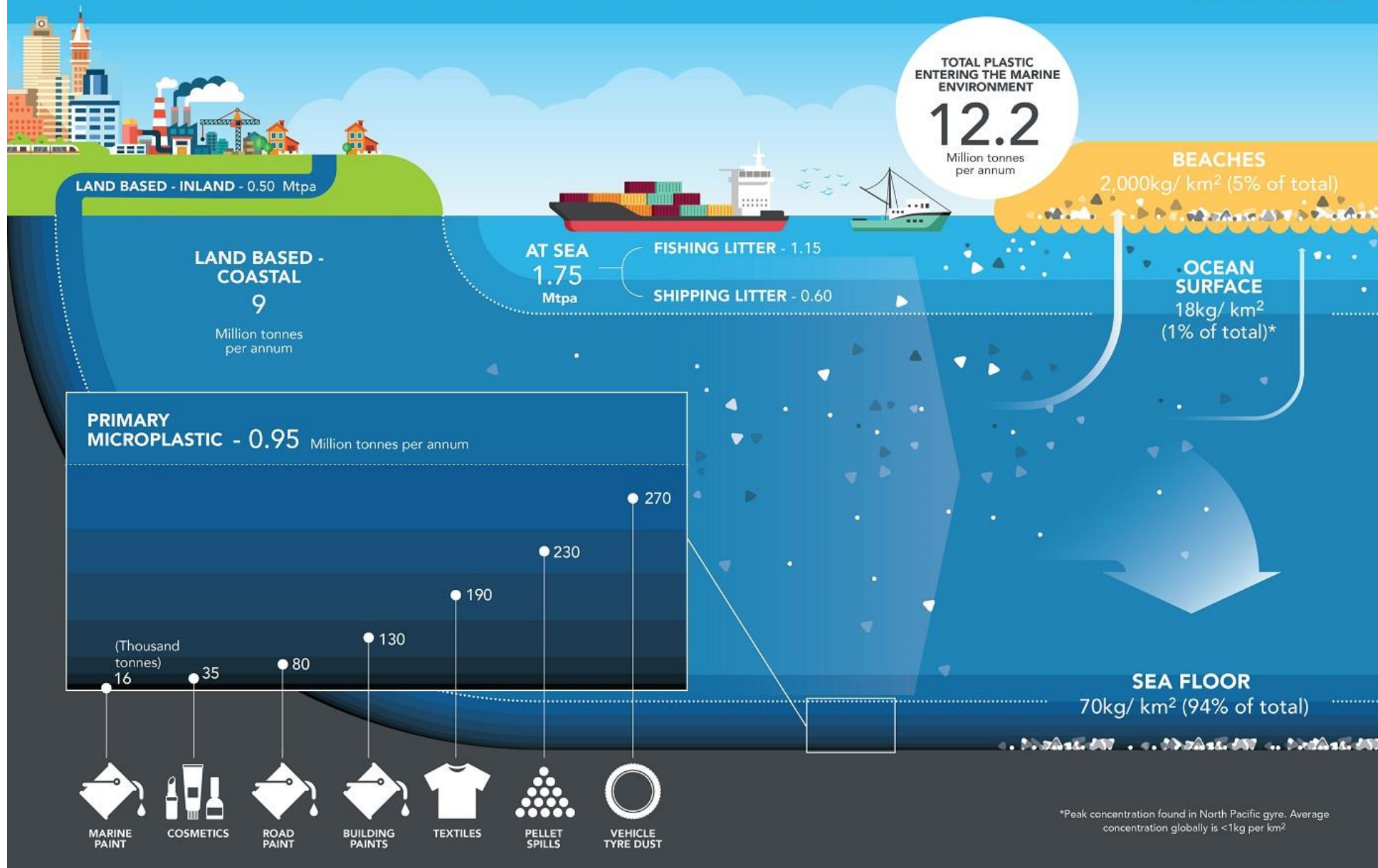
Entanglement

Digestion

?

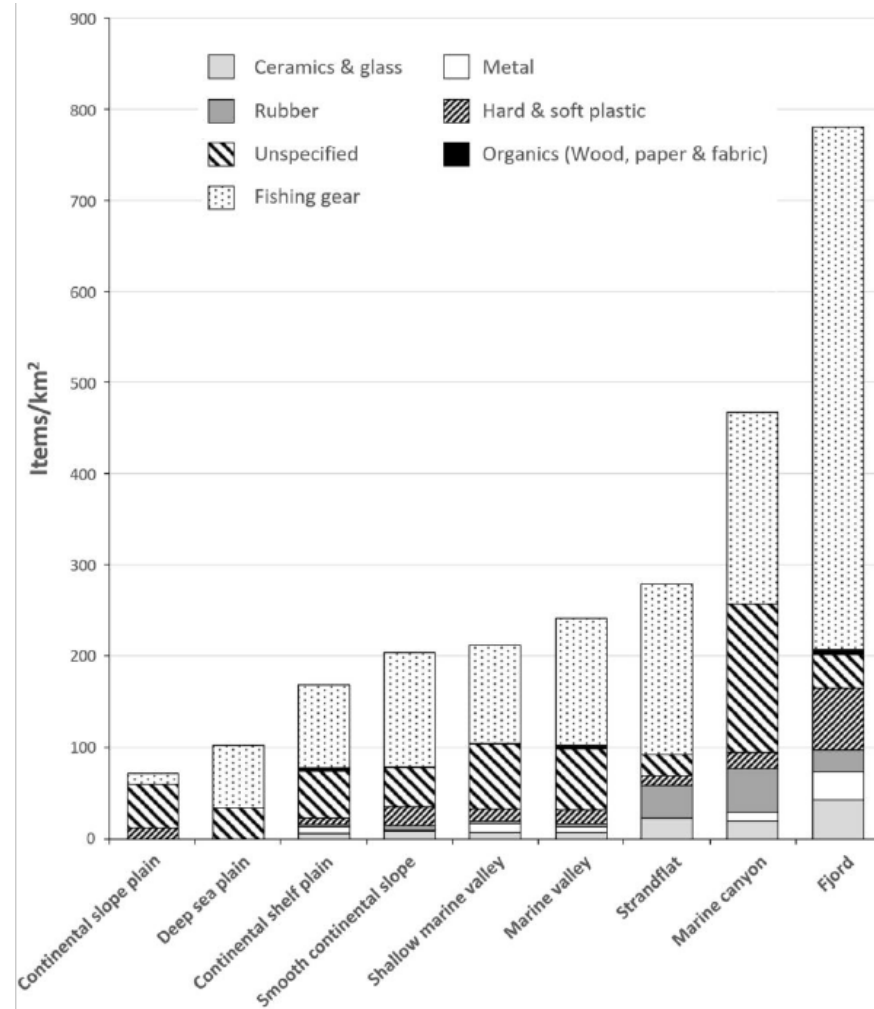
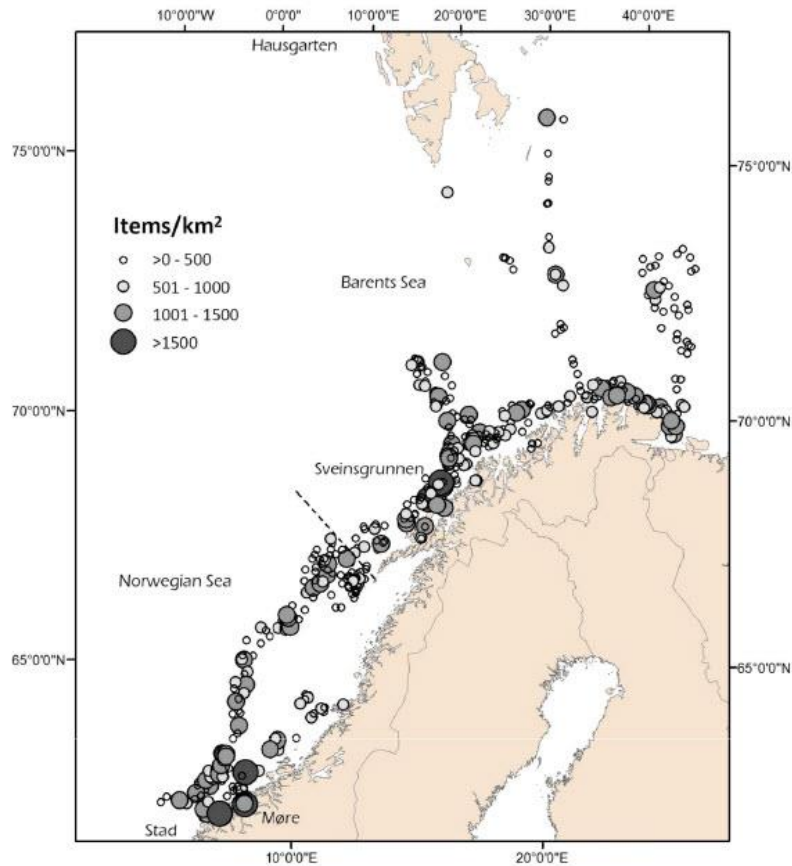
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# PLASTICS IN THE MARINE ENVIRONMENT: WHERE DO THEY COME FROM? WHERE DO THEY GO?



# MAREANO- mapping the sea bottom

L. Buhl-Mortensen, P. Buhl-Mortensen



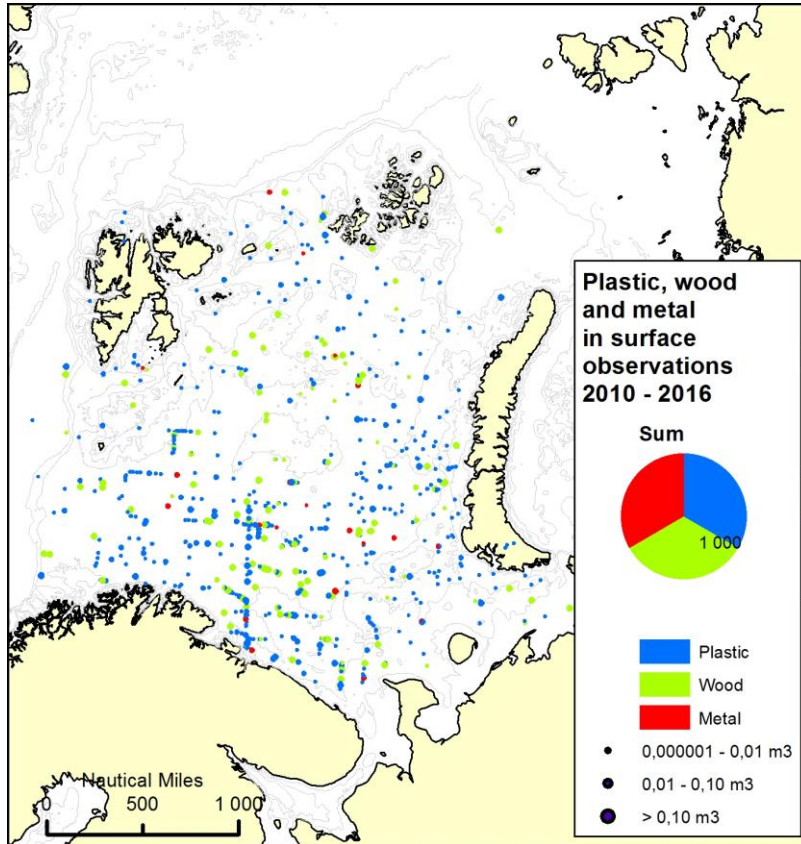
Litter observed in 28 % of video recordings

Average levels: 200 kg/km<sup>2</sup>, Max: Ca 6500 kg/km<sup>2</sup>

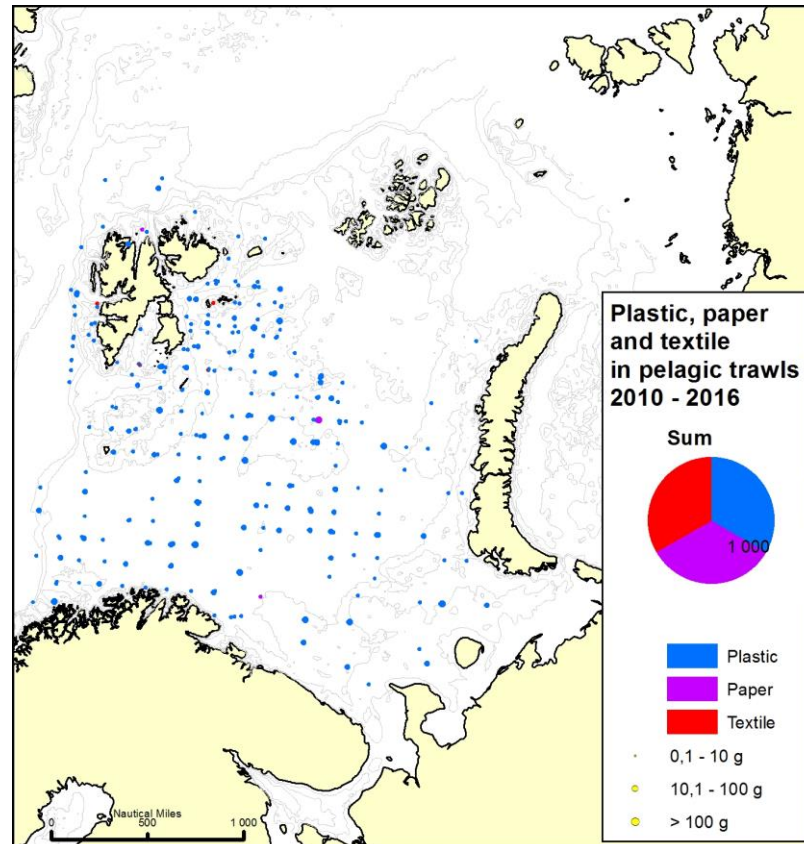
Offshore Barents Sea 154 kg/km<sup>2</sup>, offshore Norwegian Sea 123 kg/km<sup>2</sup>

# Recordings of litter from the Barents Sea

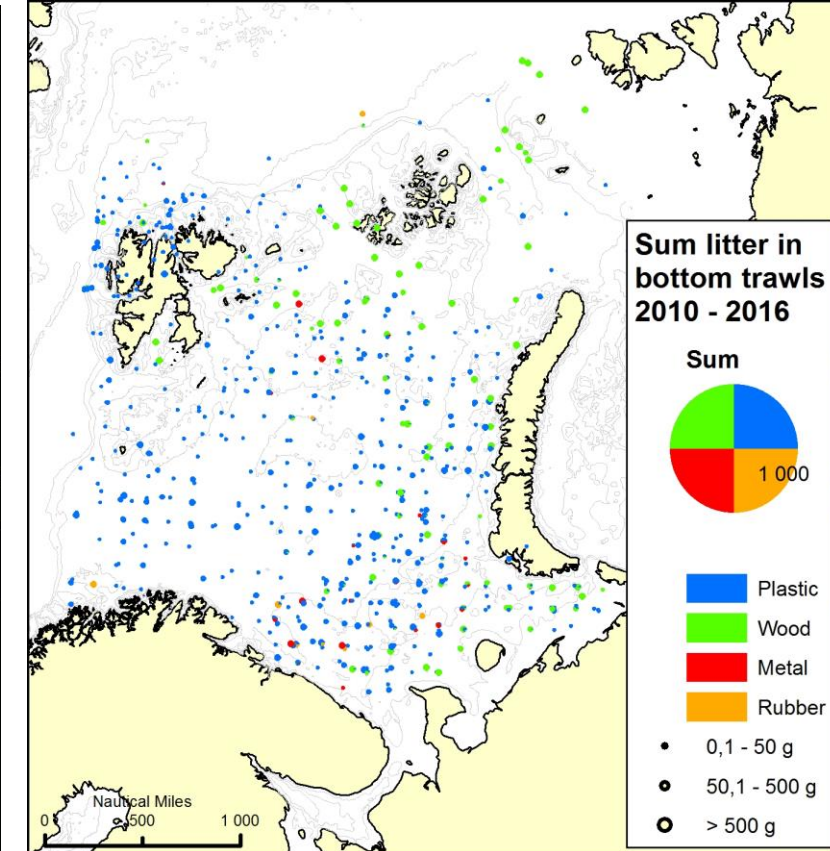
Surface observations



Pelagic trawl



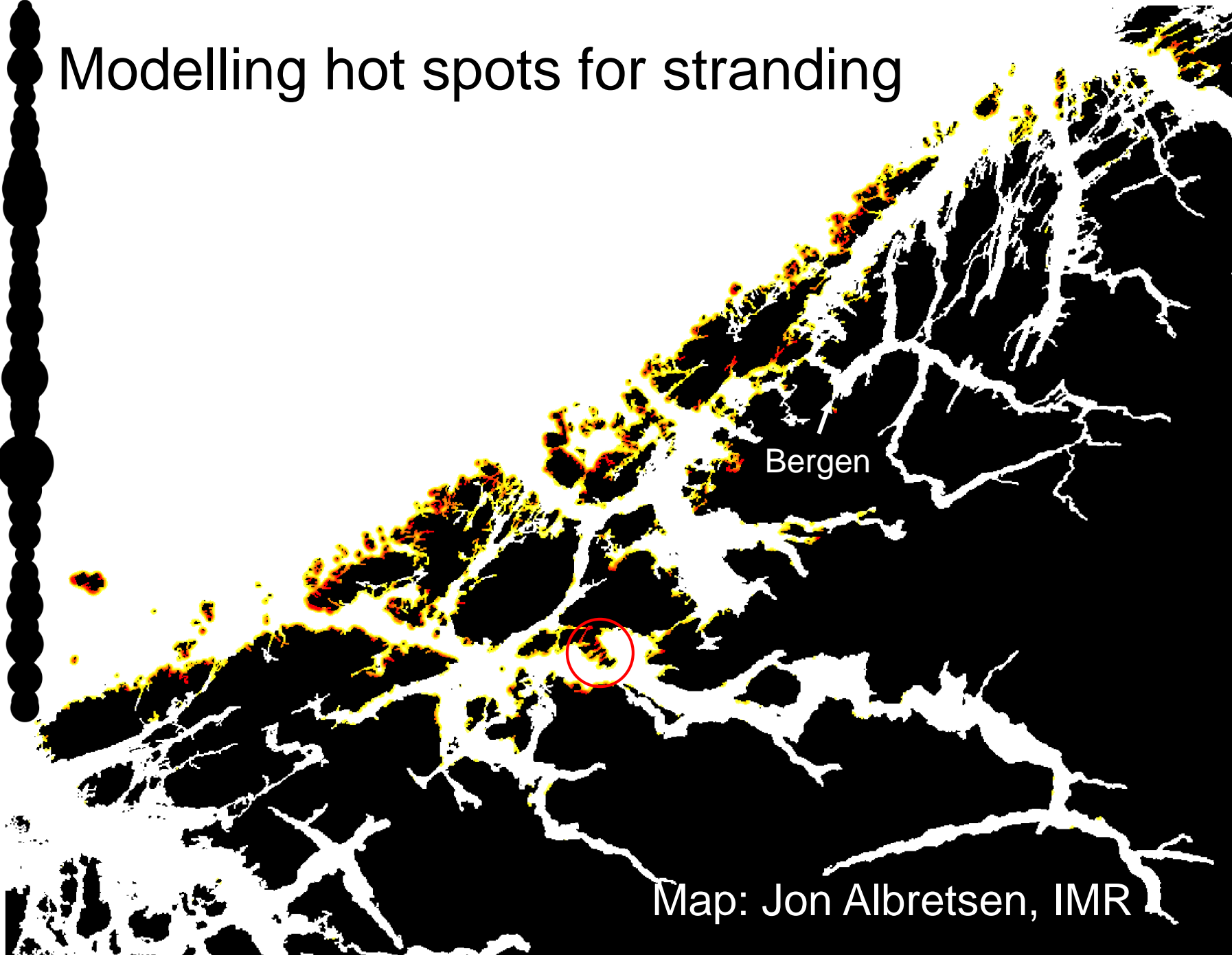
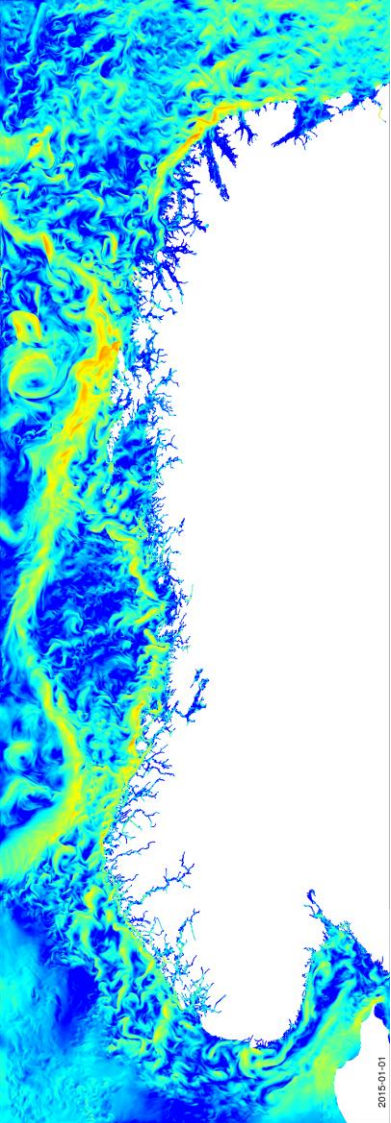
Bottom trawl



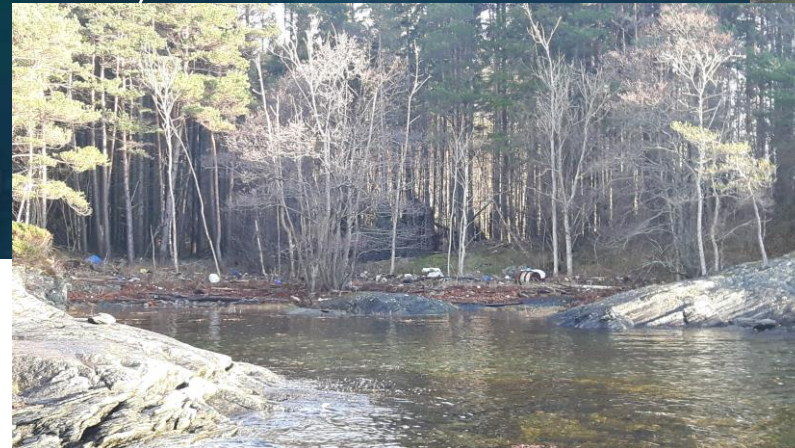
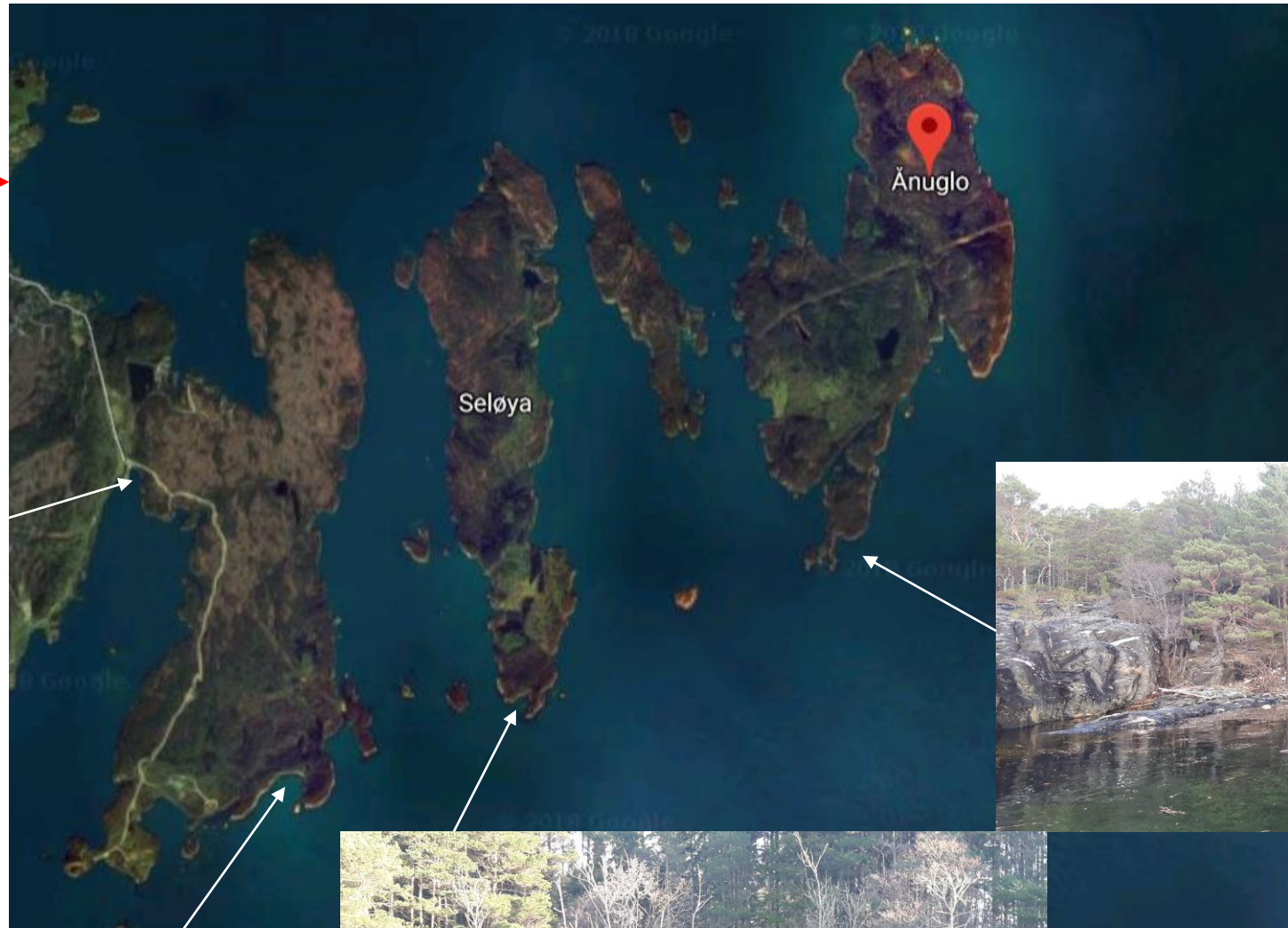
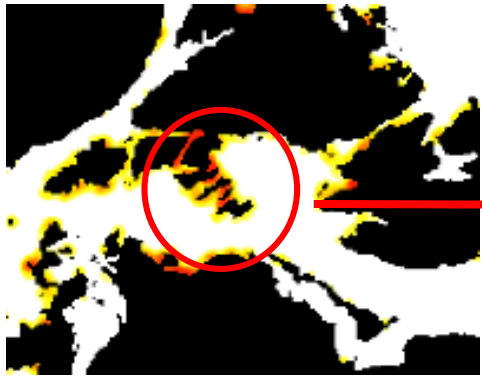
Bottom trawl: 26 kg litter km<sup>-2</sup>, 86 % of observations were plastic  
Pelagic trawl: 0.011 mg m<sup>-3</sup>, 94 % of observations were plastic



# Modelling hot spots for stranding

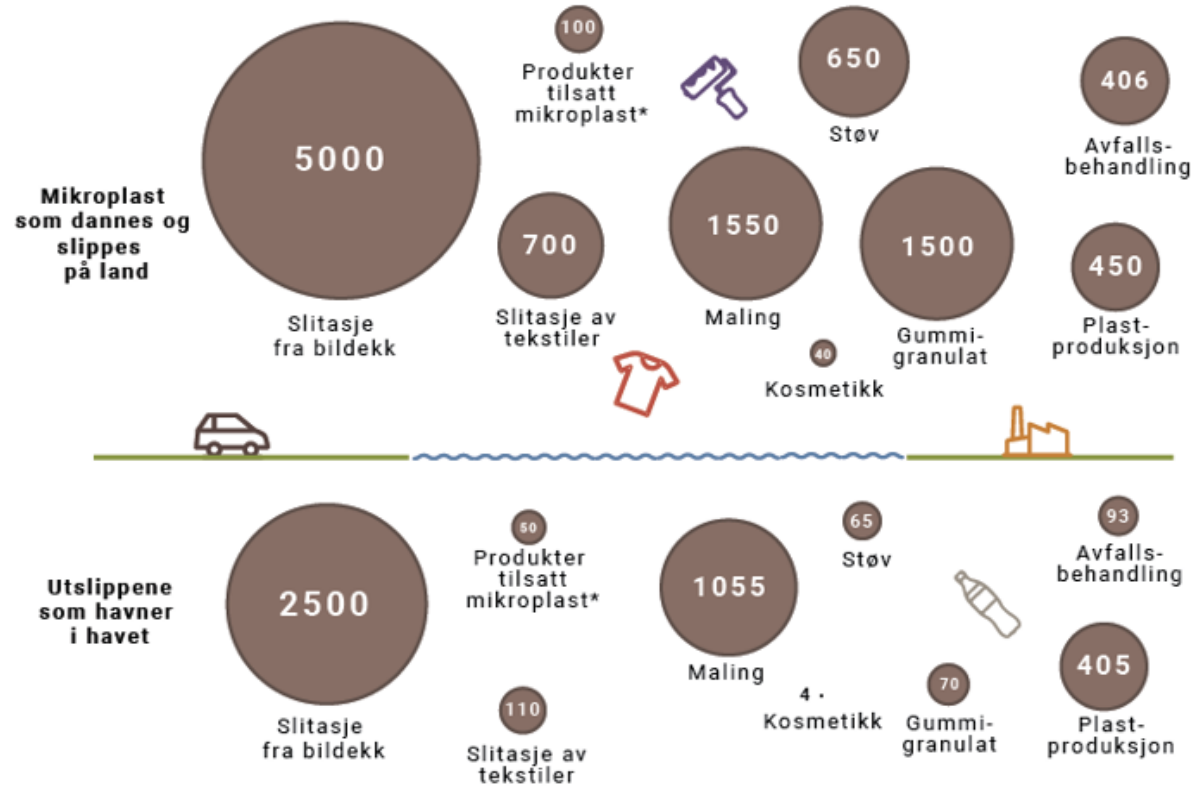


Map: Jon Albretsen, IMR



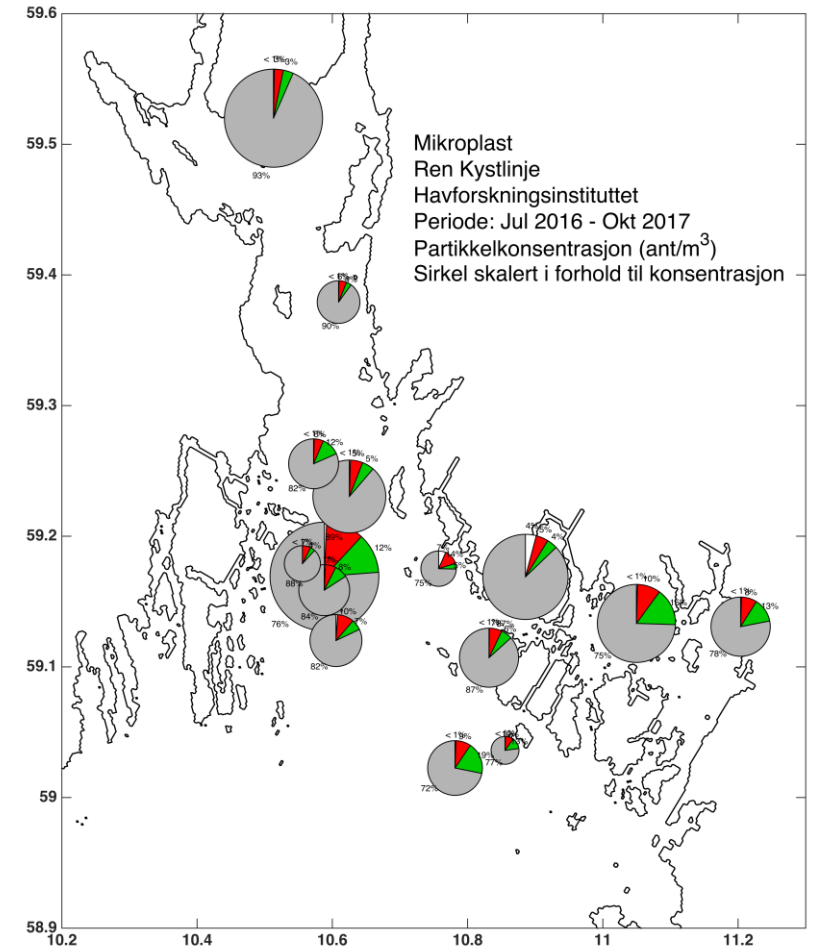
Modelling: J. Albretsen  
Photo: B.E. Grøsvik

# Sources and mapping of microplastics



\*Ikke kosmetikk

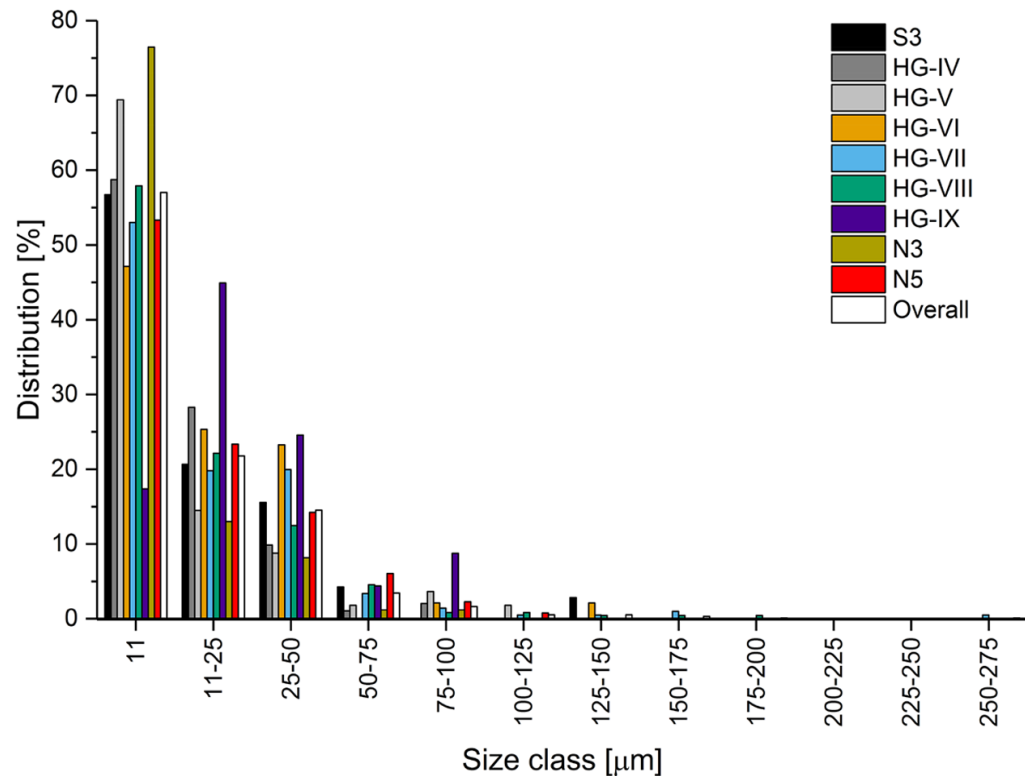
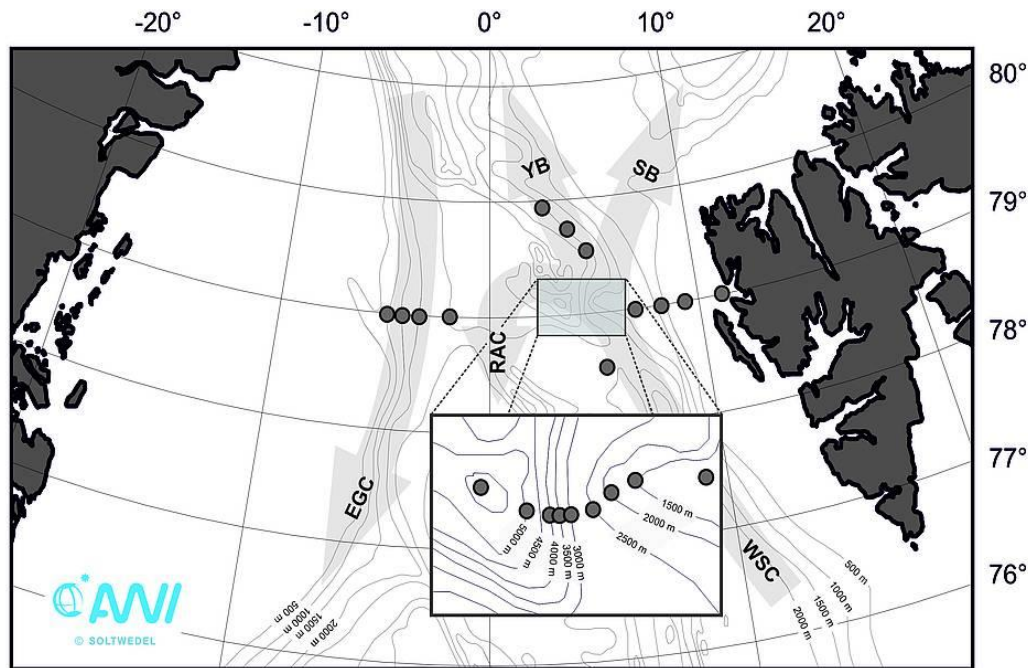
Kilde: Miljødirektoratet 2017 /Miljøstatus.no



80 % Black particles (asfalt, tires)  
9 % Ropes/fibres  
7 % Fragments



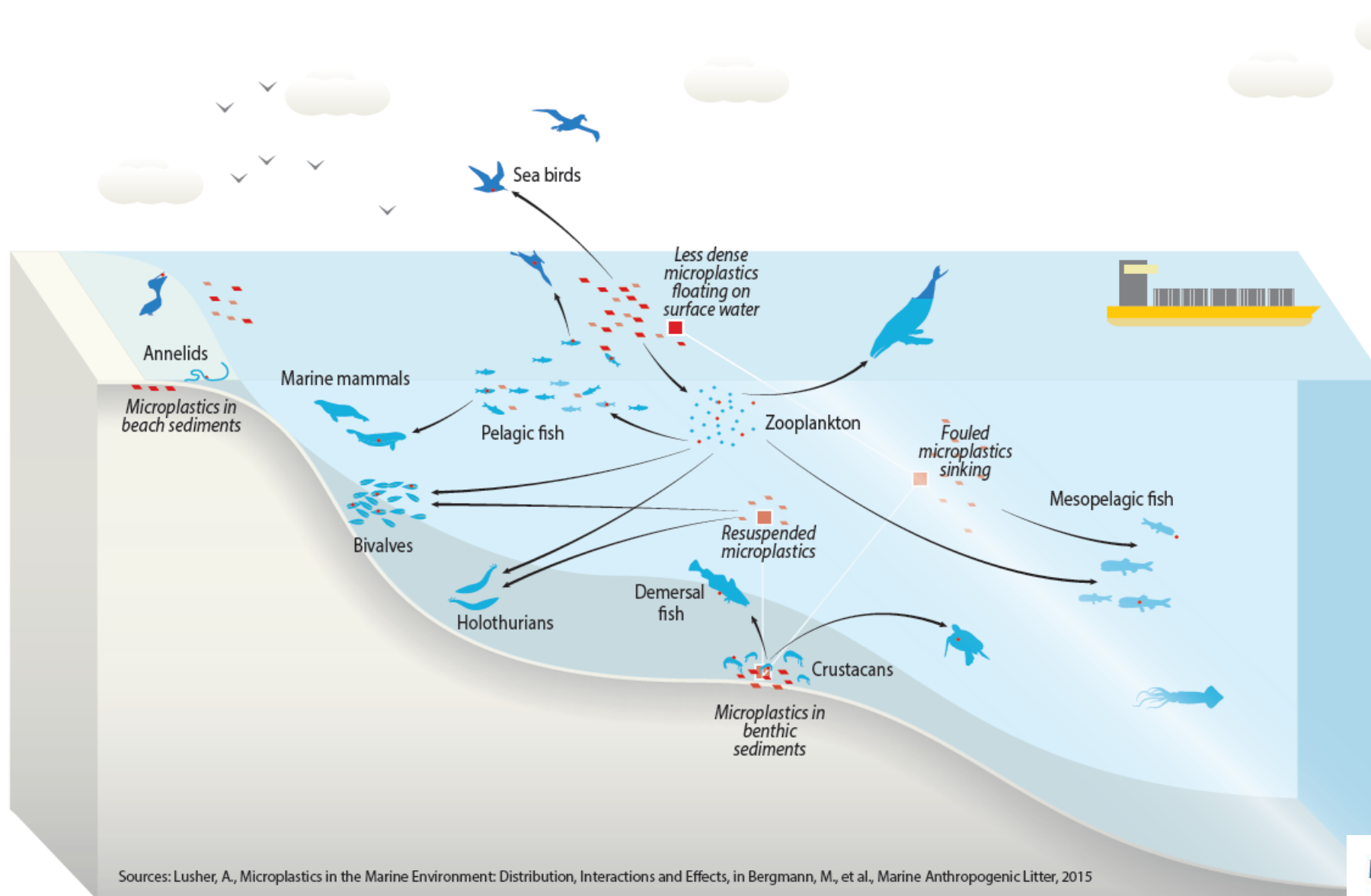
# Litter and microplastics in remote areas



Microplastics in sediments:  
 2340-5570 m depth  
 42-6595 particles/kg sediment

80 % of microplastics were < 25 µm

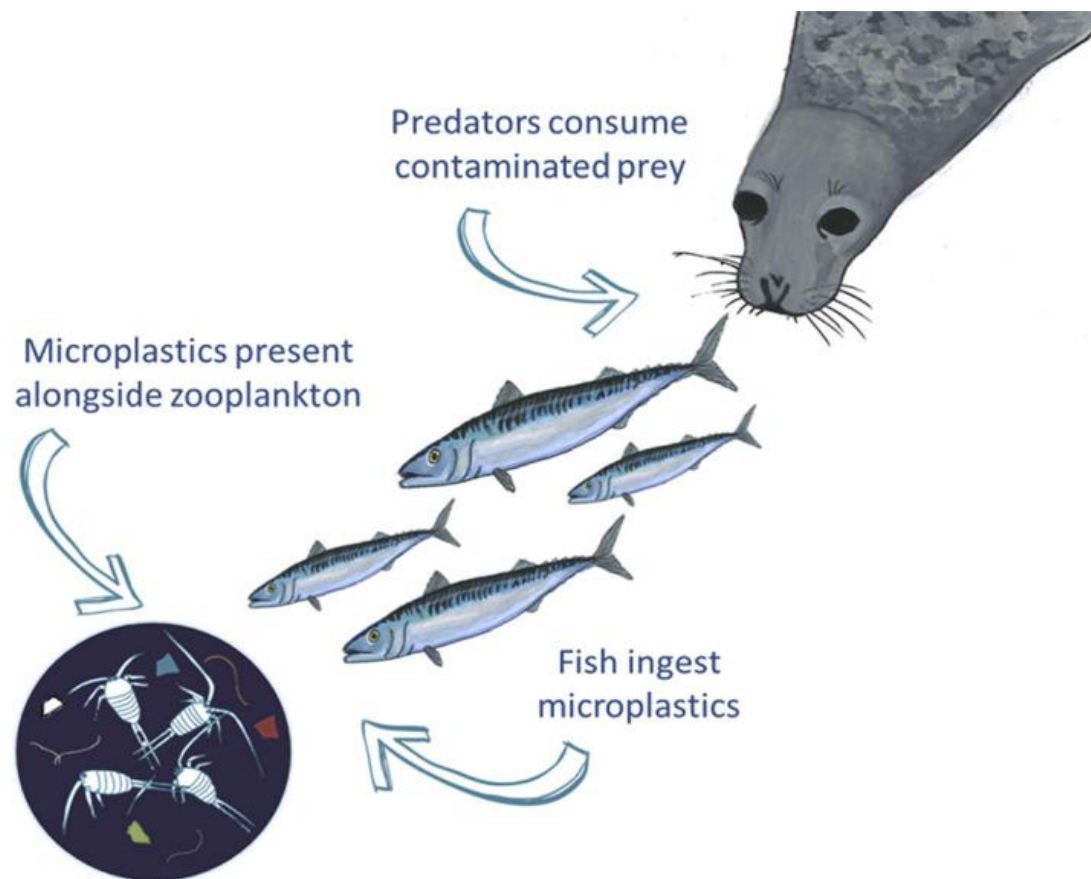
# How can plastic particles be taken up in the food web?



Sources: Lusher, A., Microplastics in the Marine Environment: Distribution, Interactions and Effects, in Bergmann, M., et al., Marine Anthropogenic Litter, 2015

# Effects in the marine food web?

- Trophic transfer shown in seal scat
- Lack information on effects



# We need:

- Standardisation of methods and intercalibration work
- Source, distribution and transport and fate
  - Ocean and river transport
  - Atmosphere
  - Snow
  - Sea ice
- Effects
  - Levels in different ecosystem components
  - Knowledge on which type of exposure may give effects in marine organisms
- Information regarding sea food safety



Thank you for your attention!

