Let's Put an End to Marine Plastic Pollution

Dave West , December 2015

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Every Piece of Plastic Made Still Exists Today!

“Plastic is so permanent and so indestructible that when you’ve tossed it, in the ocean or even into a dustbin ... it does not go away” **Sir David Attenborough**

“Once in the ocean, plastic does not go away: it fragments, breaking down into smaller pieces and acts as a vector for chemicals such as persistent organic pollutants that may be transferred into the food chain upon ingestion by marine organisms. Transported by ocean currents, few places around the globe have not been infested by this material.” **Achim Steiner, Executive Director UNEP**

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Compostable? Biodegradable? No Solution At All!

- Biodegradable plastic can be bio-based or oil-based and meet current inadequate standards for biodegradability and compostability. Degradable or oxo-degradable plastics are usually oil-based plastics to which additives have been added to enhance the degradation into small pieces, but are not truly biodegradable or compostable. standards.
- An example of bio-based and bio-degradable plastic is polylactic acid (PLA), which dominates the so called bio-plastic bag market.
- Confusion often stems from inadequate labelling and lack of consumer knowledge, leading to recycling stream contamination.
- Bio-plastics have different degradation times and infrastructure needs, often requiring an industrial composter, rare in most of the world, to biodegrade as advertised.
- If littered, bio-plastics have the same end-of-life impacts on the environment as oil-based plastics.

Globally:

- 275 million tonnes of plastic waste is generated each year
- This year over 9 million tonnes of plastic will enter the marine environment
- It is estimated that over 5.25trillion pieces of plastic are currently floating in the worlds oceans (that doesn't include microplastics less than 0.4mm in size)
- Every klm^2 of deep ocean sediment is polluted with up to 4 billion nanoplastic fibres
- Plastic's damage bill to the marine environment is approx. $AUD $18billion p.a.

Plastic Consumption in Australia:

- We have identified at least 3million tonnes of plastic products and packaging used in 2013. Government estimates are badly underestimated at 1.55million tonnes.
- The amount of plastics we consumed doubles every 11 years (9.1% p.a.). Government regulatory investigations put growth of plastic consumption at just 0.4% p.a.
- We use 861,000 tonnes of plastic packaging a year (102kg per household).
- Australia's effective Plastics Recycling Rate is just 9.9%!

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Plastics Consumption

Estimated Plastic Consumption in Australia (2013/'14)	Tonnes P.A.
Australian Made Plastic Products	1,008,200
Australian Made Plastic Packaging	527,000
Plastics Packaging Imported on finished goods	417,000
Synthetic Textile, Fabric and Carpet Imports	300,000
Imported Plastic Products (houseware, furniture, pipes etc.)	290,000
Clean Plastic Component of Machinery	65,000
Contaminated Plastic Component of Machinery	266,000
Plastic component of tyres	145,350
Imported Plastic Grocery Bags	21,000
Plastic Maritime Waste	10,000
Cigarette Butts	7,000
Microbeads	650
Total:	**3.057,500**

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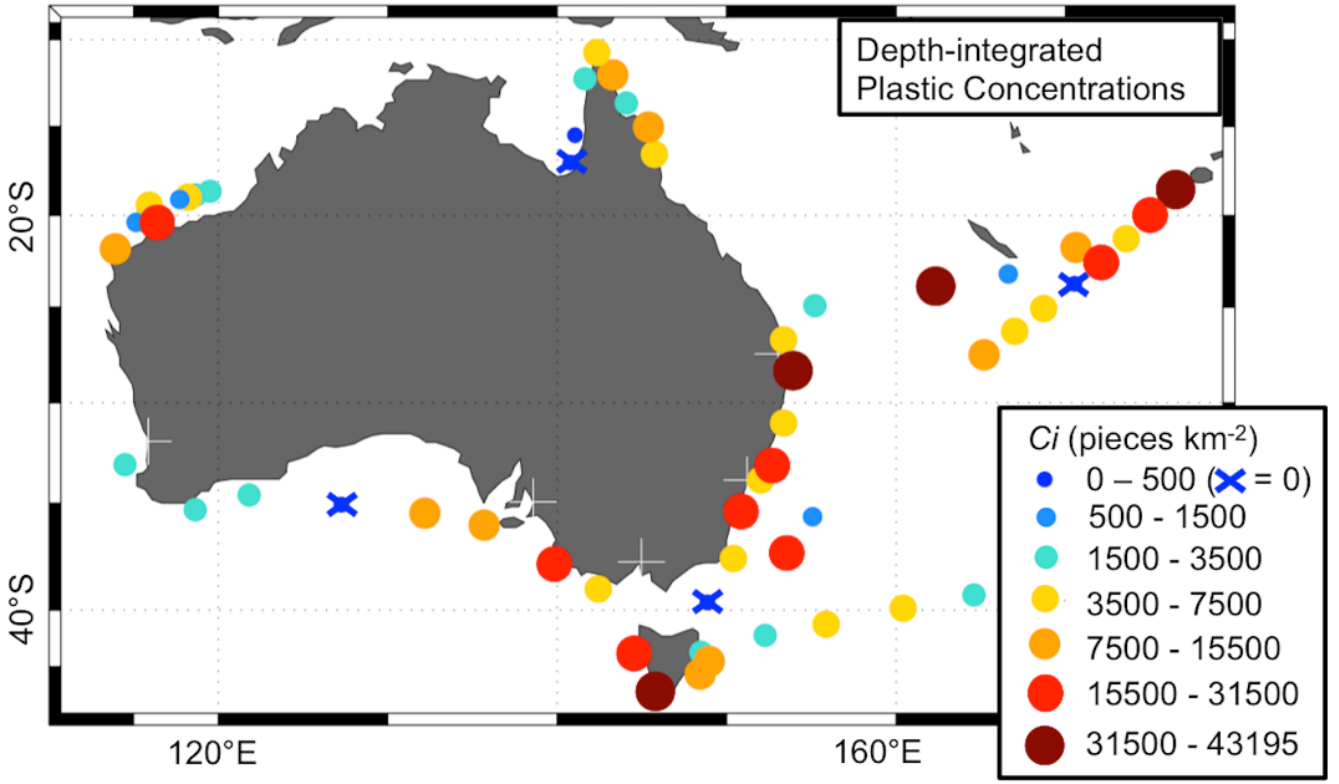
Plastic Soup in Australia

- As much as 80% of all plastic pollution **‘disappears’** once it enters our waters – either ingested, exported to the gyres, or broken down to the point it isn’t visible.
- 34.9 billion pieces of **visible** plastic are floating in Australia’s waters (4,256.4 pieces $km^{2)}$.
- There is 3,461 piece of **visible** plastic on each km of Australian coastline
- The concentration of plastic pollution around East Coast cities is 5-10 times higher



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Plastics Consumption

Plastic Consumption

(approx. 3million Tonnes/P.A.)

Plastic Waste

(approx. 2.2million tonnes)

- Less than 10% is recycled

Plastic Litter

(80,000 tonnes)

Maritime Waste

(10,000 TPA)

Marine Plastic Pollution

60,000 TPA

- Litter: 36,000
- Maritime Waste: 10000
- Primary microplastics: 14,000

Our Gov't Dodgy estimates:

Only accounts for 50% of plastic consumed – failing to consider imported products and packaging

Exaggerates plastic recycling by:
- Ignoring imported plastics in estimates; &
- Including 'pre-consumer recycling' which is little more than greenwash

Underestimations of Consumption and waste in turn sees plastic litter and marine debris

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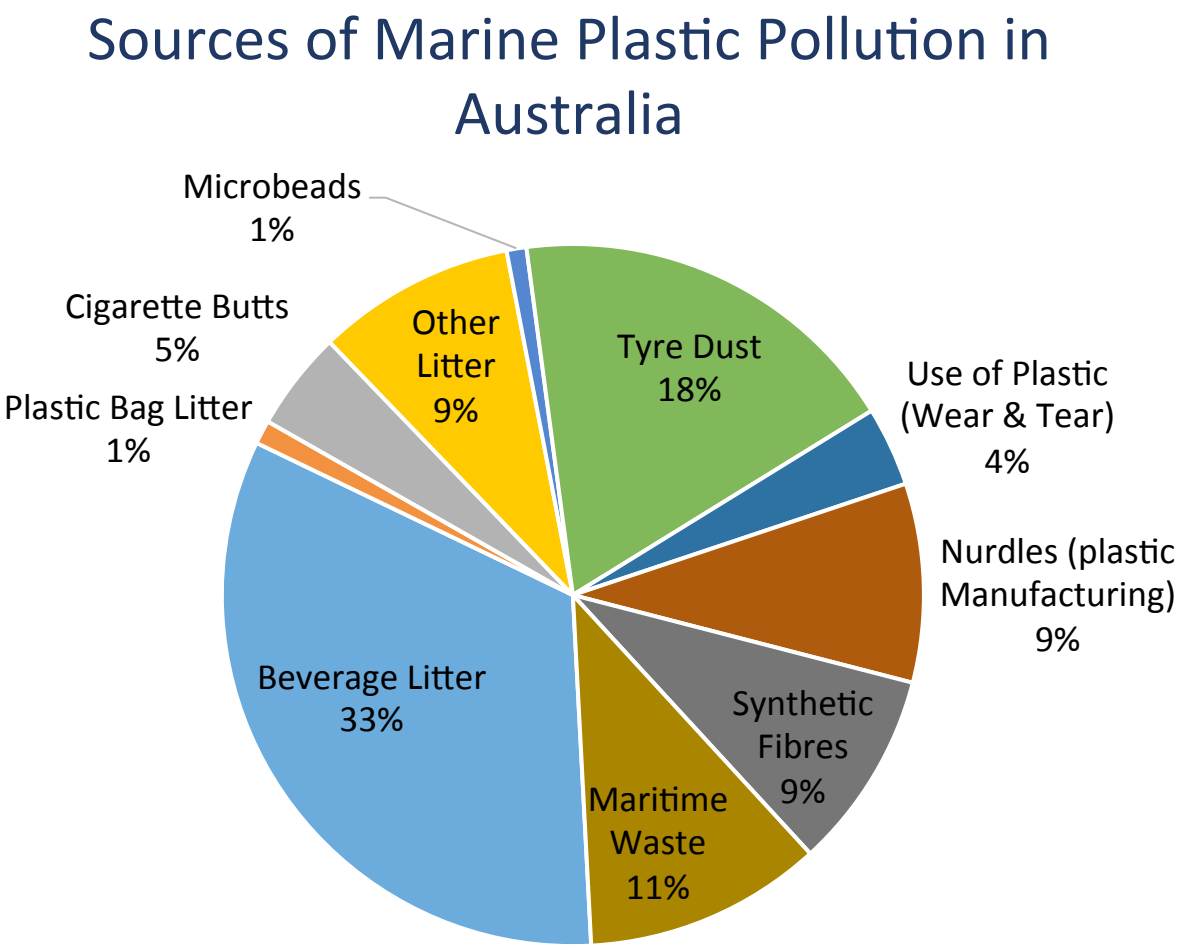
Source of Plastic Pollution

- ½ of Marine Plastic Pollution comes from land based littering – 65% are beverage containers.
- Maritime Waste represents 11%
- There are no (achievable) solutions to eliminate ⅓ of all marine plastic pollution (nanoplastics when released)
- Production Losses and Discharges in waste & recycling are rapidly becoming a major source (at least 9%);
- While microbeads and bags only represent 2% of the total pollution they are a major threat to biodiversity.



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Plastic Pollution: Litter

Annually, over 60,000 tonnes of plastics are littered each year. Litter comprises >60% of All Marine Plastic Pollution, including:

- Around 420 million plastic bottles (18,000T)
- Another 200 million other packaging items (5,000T)
- 180million Plastic Bags (55T)
- 10 million plastic products
- 11 billion+ synthetic cigarette butts (3,500T)

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Microplastic Pollution

Microplastics are pieces between 100 nm and <5mm; nanoplastics are smaller than 100NM (a human hair is 75 nm in diameter).

- It is likely that approx. 20,000 tonnes p.a. of plastic pollution is missed in previous studies as they are too small to identify / capture (primary microplastics and secondary nanoplastics).
- While they weigh far less; at 1 mg per piece of microplastic this represents 20trillion pieces of plastic entering our marine environment each year (compared to an estimated 34billion larger pieces in Australian waters).
- Sooner or later every piece of plastic that enters the marine environment will abrade and degrade until it reaches the nanoplastic size.
- These materials are a primary threat to biodiversity – 96% of the food chain are likely to digest them & the particles can then pass from the gut into the bloodstream.

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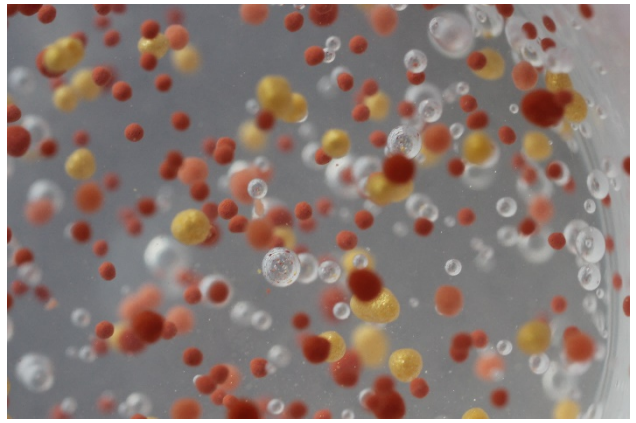
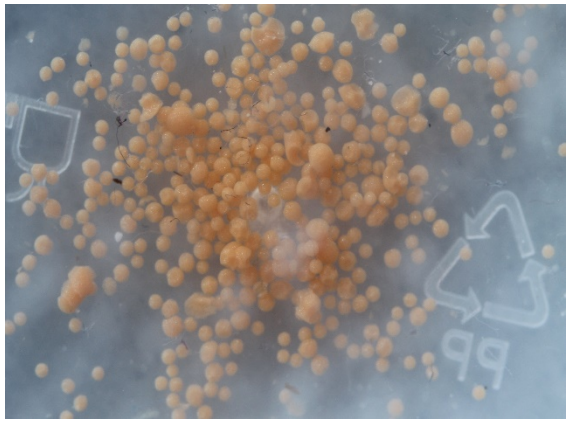
Microplastic Pollution

MICROBEADS (Scrub)



MICROBEAD (Detergent)

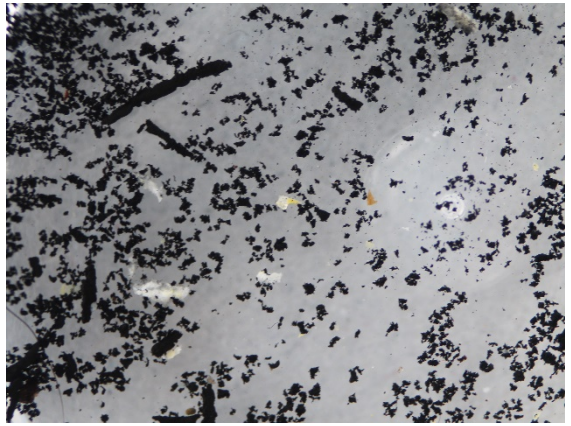


NURDLES (Pellets)

NANOFIBRE (Clothing)

SECONDARY MICROPLASTIC

TYRE DUST



NURDLES (Flake)

NANOFIBRES (Butts)

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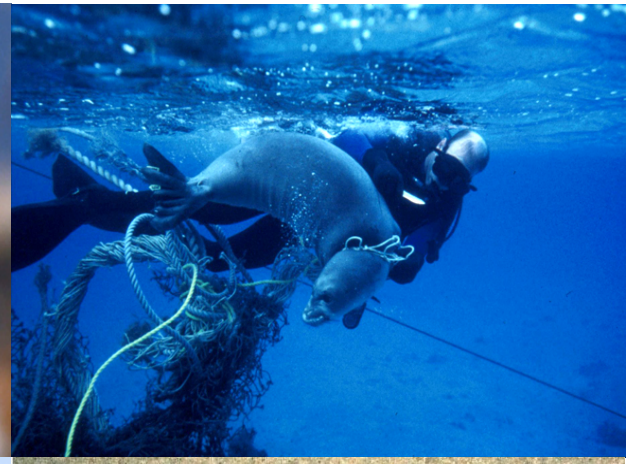
Plastic Pollution Impacts

ENTANGLEMENT (restricts a species ability to move, swim, breath):



- Affects at least 200 marine species
- 44 sea bird species, 9 cetaceans, 11 pinnipeds, 31 invertebrates, and 6 sea turtle species are suffering from entanglement
- The rate of entanglement by marine debris has increased by 40% over the past 10 years
- 20% of entanglements reported are from litter (bags, ribbons, packing tape)
- Between 5-15,000 turtles become entangled in ‘ghost nets’ in the Gulf of Carpentaria
- 40,000 fur seals deaths by entanglement p.a.

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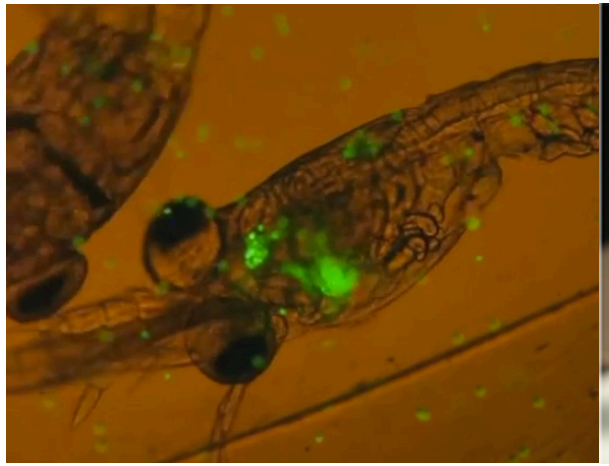
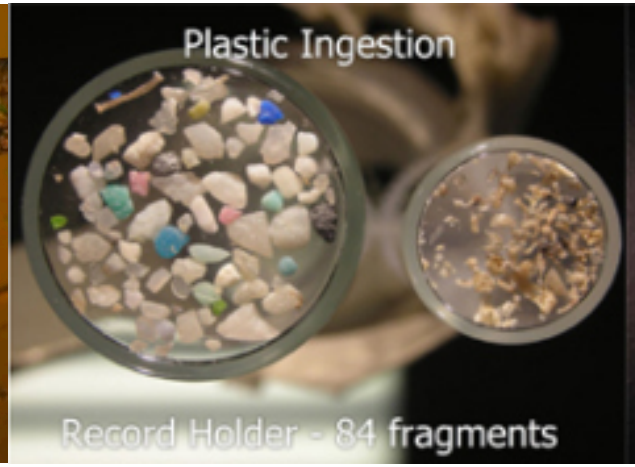
Plastic Pollution Impacts

INGESTION

- 96% of all biodiversity is vulnerable to the ingestion of microplastics
- 65% of all seabirds studied have been found to have plastic in their gut. By 2050 CSIRO estimates it will reach 99%
- 30% of all turtles autopsied in Moreton Bay have been found to have ingested plastic
- Coral has been found to be ingesting microplastics at about the same rate as plankton





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WARNING!

"ANYONE CONSUMING AN AVERAGE AMOUNT OF SEAFOOD WILL INGEST ABOUT 11,000 PLASTIC PARTICLES EACH YEAR!"

Some monomers and additives (Styrene, Polyvinyl Chloride, Bisphenol A) used in plastic production are toxic

Microplastics act as sponge, absorbing pollutants at up to 1million times higher concentrations than the seawater surrounding it…

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References

- Sources of Microplastic Pollution to the Marine Environment
- Plastic Waste inputs from land into the Ocean
- Professor Tamara Galloway, Exeter University
- Living Blue Oceans Report 2015 – WWF and The London Zoological Society
- National Waste Report 2010 & 2014(?) Australian Government Department of Environment
- 2014 & 2015 Annual Plastics Recycling Survey – Australian Packaging Covenant
- CSIRO Marine Debris Project
- National Litter Index 2012,2013,2014 – Keep Australia Beautiful
- Rubbish Report (various years) – Clean Up Australia
- Algalita Marine Research Institute
- Royal Society Open Science Journal
- Valuing Plastic: The Business Case for Measuring, Managing and Disclosing Plastic