COLLABORATIVE RESEARCH SURVEY ON MARINE FISHERIES RESOURCES AND ENVIRONMENT IN THE GULF OF THAILAND 2018

Accumulation of microplastics in waters and sediments in the Gulf of Thailand

Presented by

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What era are we at?





BC AD

2,500,000 -------– 10,000 -------- 1,000 --------- 300 ------0 ---------- 2017

Old Stone Age

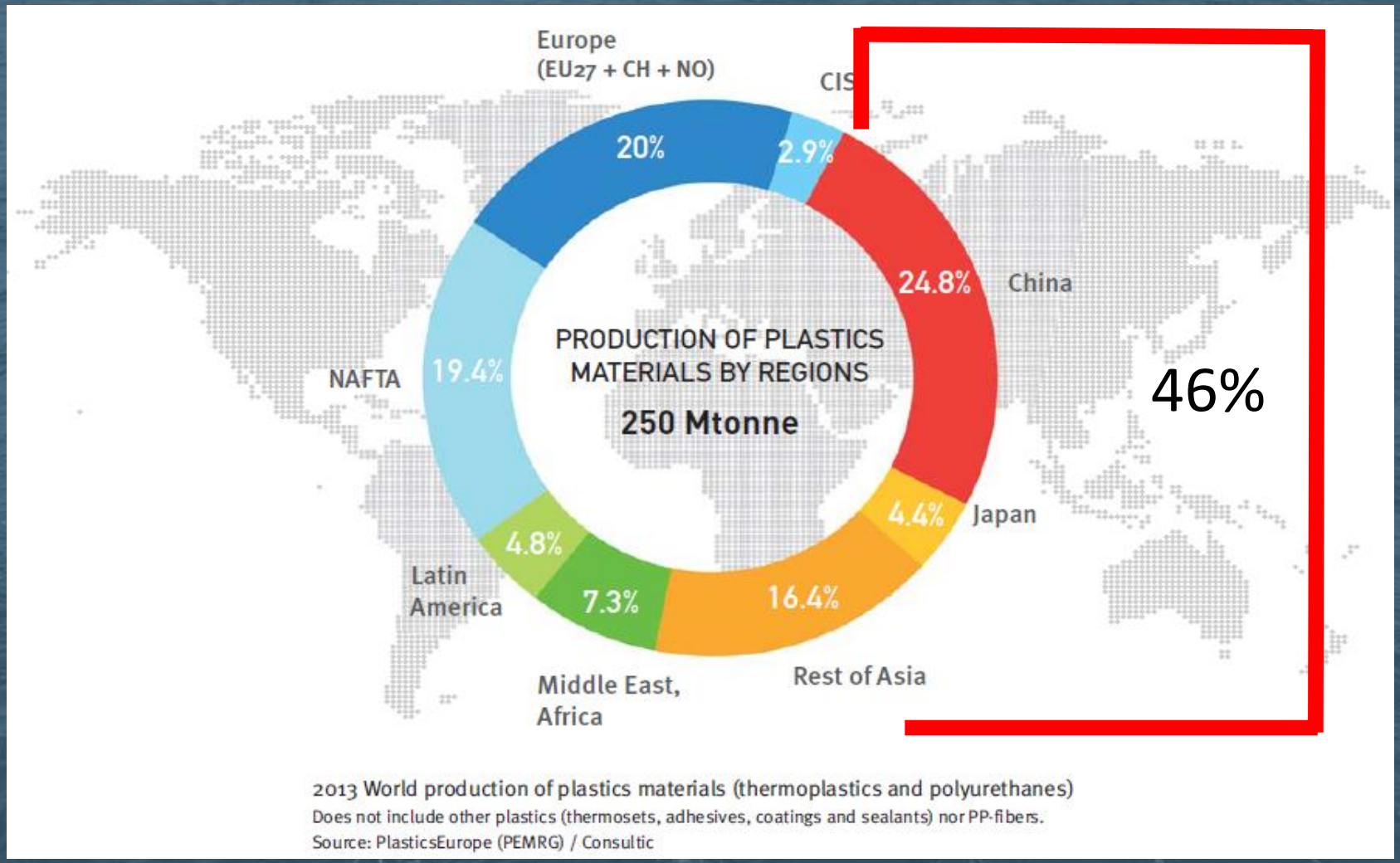
New Stone Age

Bronze Age

Iron Age

Plastic Age

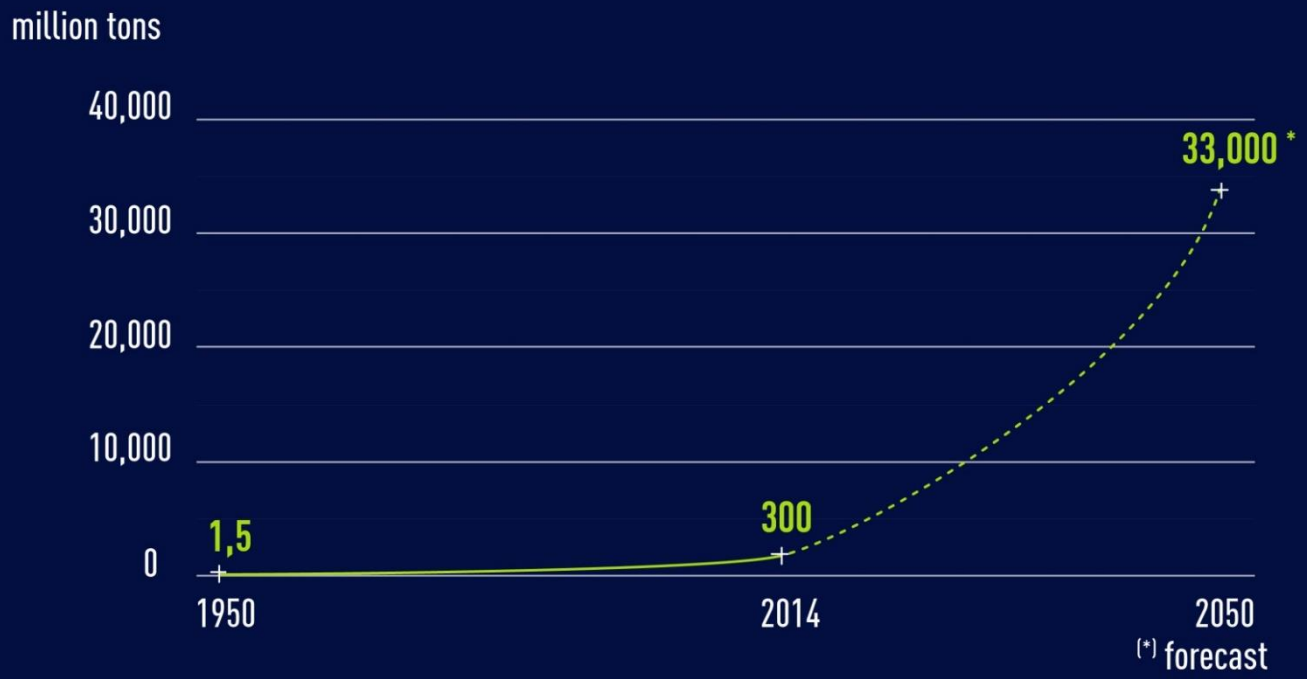
Global Plastic production



2013 World production of plastics materials (thermoplastics and polyurethanes)
Does not include other plastics (thermosets, adhesives, coatings and sealants) nor PP-fibers.
Source: PlasticsEurope (PEMRG) / Consultic

PEMRG 2014

The evolution of global plastic production



open_ resource by SUEZ

Source: UNEP

Source:: https://aloudbangkok.wordpress.com

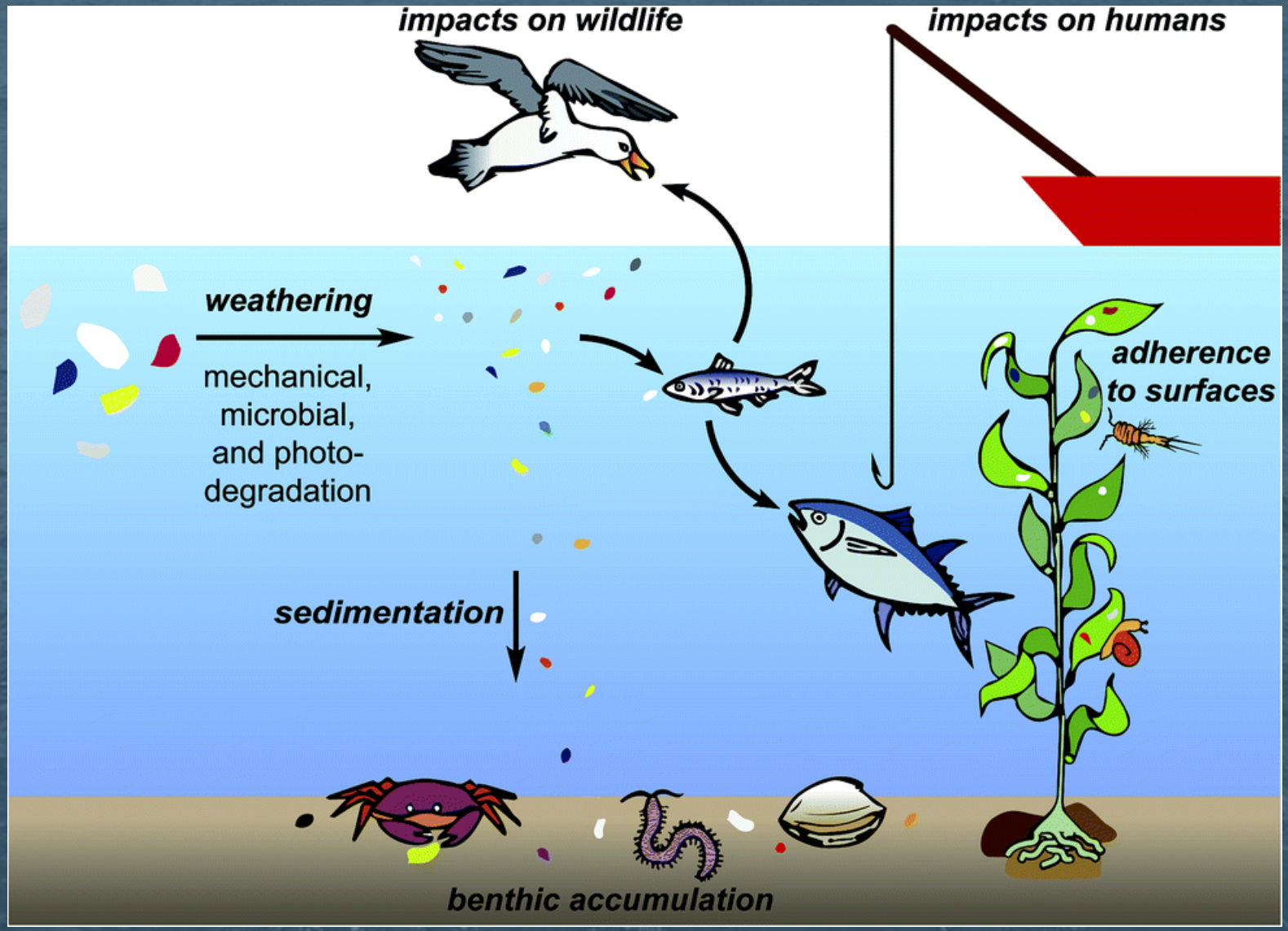
Table 1. Waste estimates for 2010 for the top 20 countries ranked by mass of mismanaged plastic waste (in units of millions of metric tons per year). Econ classif., economic classification; HIC, high income; UMI, upper middle income; LMI, lower middle income; LI, low income (World Bank definitions based on 2010 Gross National Income). Mismanaged waste is the sum of inadequately managed waste plus 2% littering. Total mismanaged plastic waste is calculated for populations within 50 km of the coast in the 192 countries considered. pop., population; gen., generation; ppd, person per day; MMT, million metric tons.

Rank	Country	Econ. classif.	Coastal pop. [millions]	Waste gen. rate [kg/ppd]	% plastic waste	% mismanaged waste	Mismanaged plastic waste [MMT/year]	% of total mismanaged plastic waste	Plastic marine debris [MMT/year]
1	China	UMI	262.9	1.10	11	76	8.82	27.7	1.32–3.53
2	Indonesia	LMI	187.2	0.52	11	83	3.22	10.1	0.48–1.29
3	Philippines	LMI	83.4	0.5	15	83	1.88	5.9	0.28–0.75
4	Vietnam	LMI	55.9	0.79	13	88	1.83	5.8	0.28–0.73
5	Sri Lanka	LMI	14.6	5.1	7	84	1.59	5.0	0.24–0.64
6	Thailand	UMI	26.0	1.2	12	75	1.03	3.2	0.15–0.41
7	Egypt	LMI	21.8	1.37	13	69	0.97	3.0	0.15–0.39
8	Malaysia	UMI	22.9	1.52	13	57	0.94	2.9	0.14–0.37
9	Nigeria	LMI	27.5	0.79	13	83	0.85	2.7	0.13–0.34
10	Bangladesh	LI	70.9	0.43	8	89	0.79	2.5	0.12–0.31
11	South Africa	UMI	12.9	2.0	12	56	0.63	2.0	0.09–0.25
12	India	LMI	187.5	0.34	3	87	0.60	1.9	0.09–0.24
13	Algeria	UMI	16.6	1.2	12	60	0.52	1.6	0.08–0.21
14	Turkey	UMI	34.0	1.77	12	18	0.49	1.5	0.07–0.19
15	Pakistan	LMI	14.6	0.79	13	88	0.48	1.5	0.07–0.19
16	Brazil	UMI	74.7	1.03	16	11	0.47	1.5	0.07–0.19
17	Burma	LI	19.0	0.44	17	89	0.46	1.4	0.07–0.18
18*	Morocco	LMI	17.3	1.46	5	68	0.31	1.0	0.05–0.12
19	North Korea	LI	17.3	0.6	9	90	0.30	1.0	0.05–0.12
20	United States	HIC	112.9	2.58	13	2	0.28	0.9	0.04–0.11

*If considered collectively, coastal European Union countries (23 total) would rank eighteenth on the list

Jambeck et al 2015 Science

Microplastics

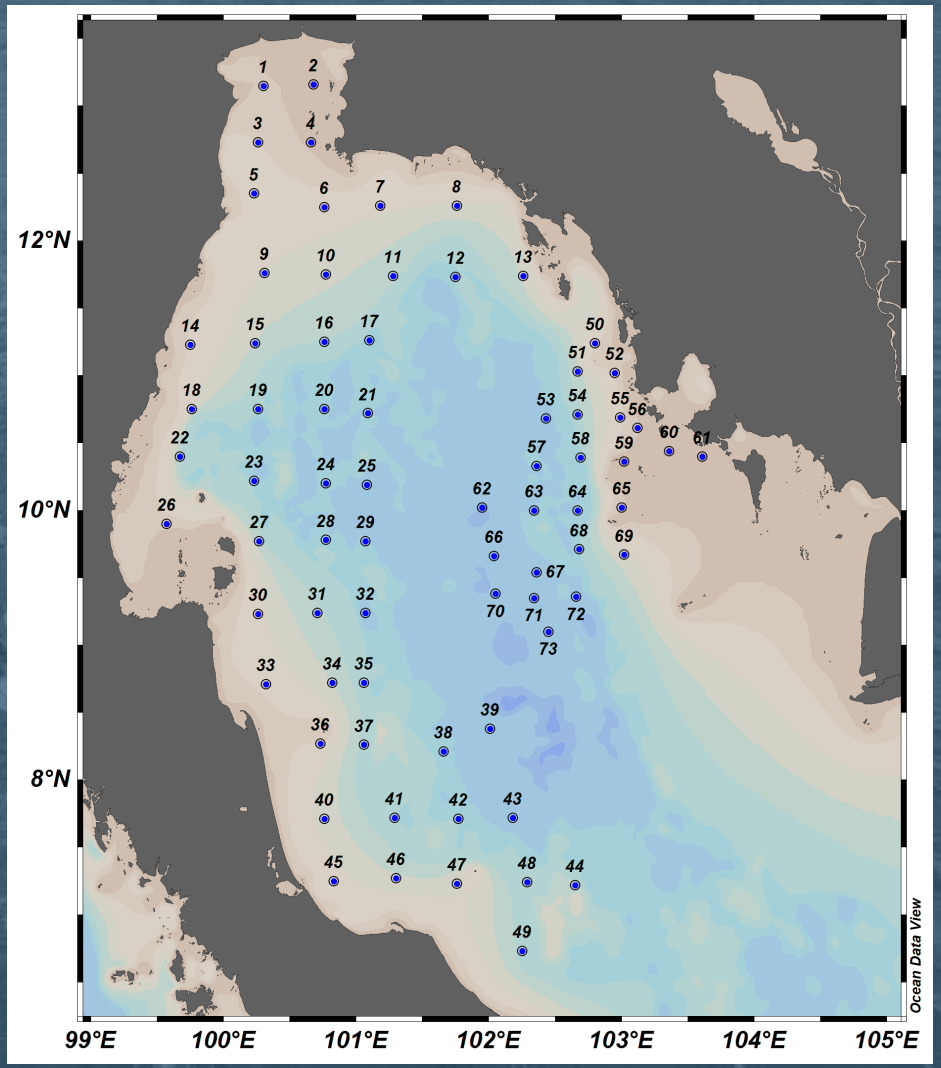


Lin 2016 Environmental Science Processes & Impacts

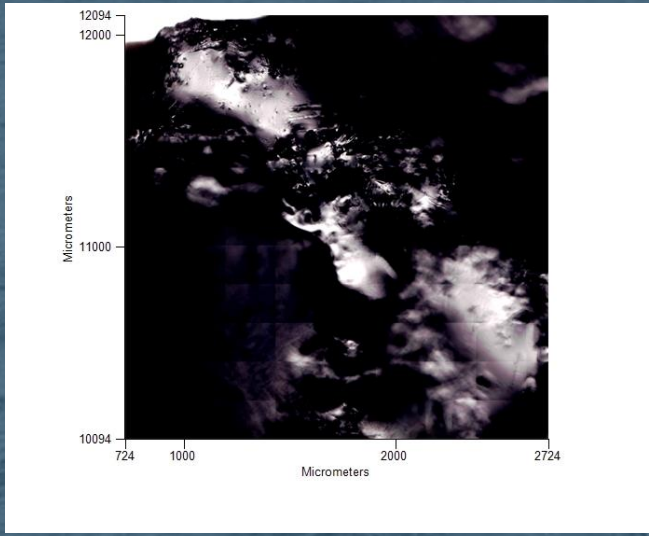
Study sites

Samples:

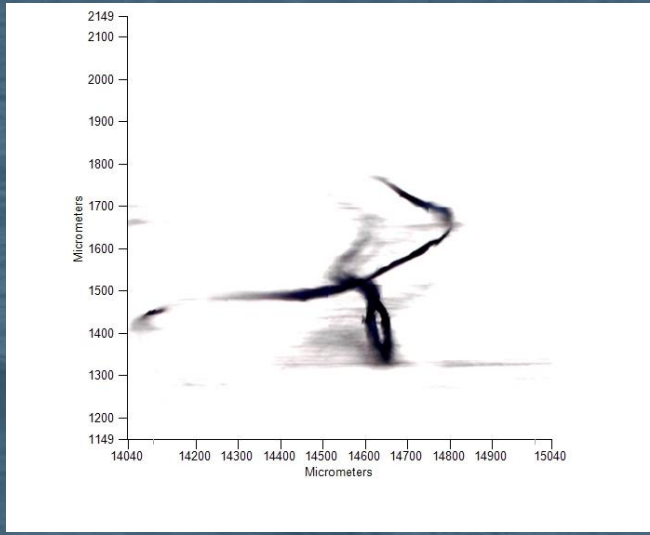
- **Sediments**
- **Water**



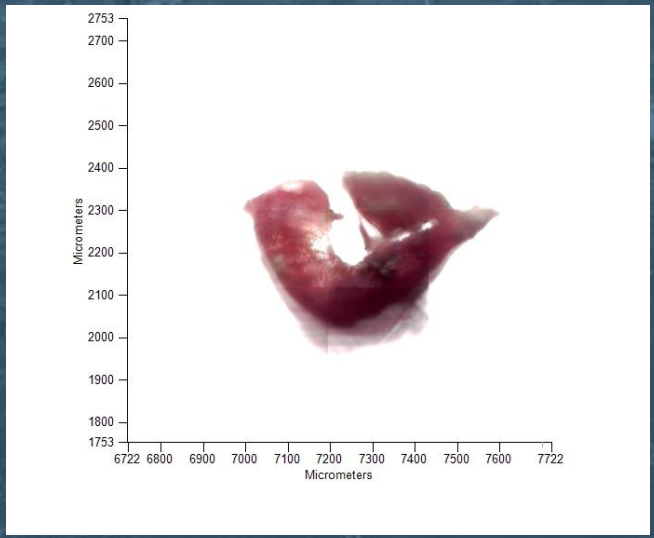
Types of microplastics



Polyvinyl chloride

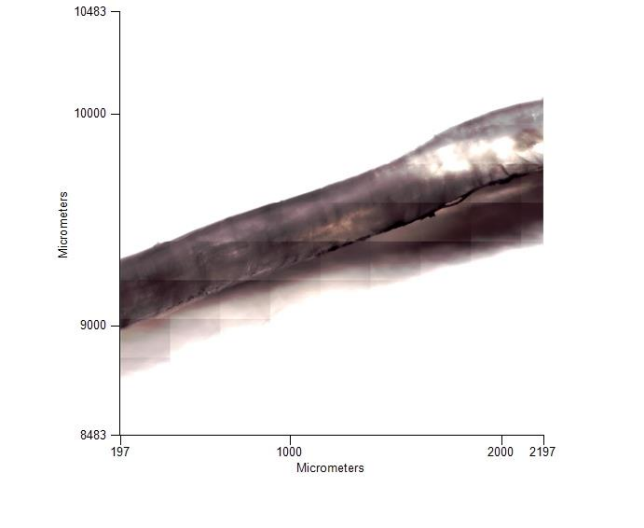


Pentaerythritol tetranitrate



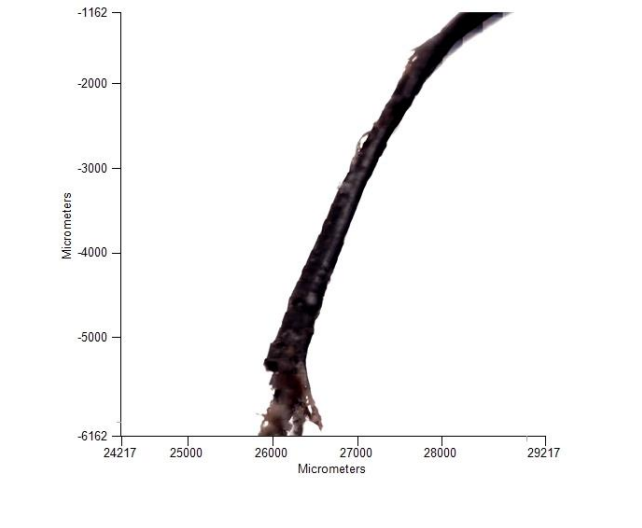
Polypropylene

Types of microplastics

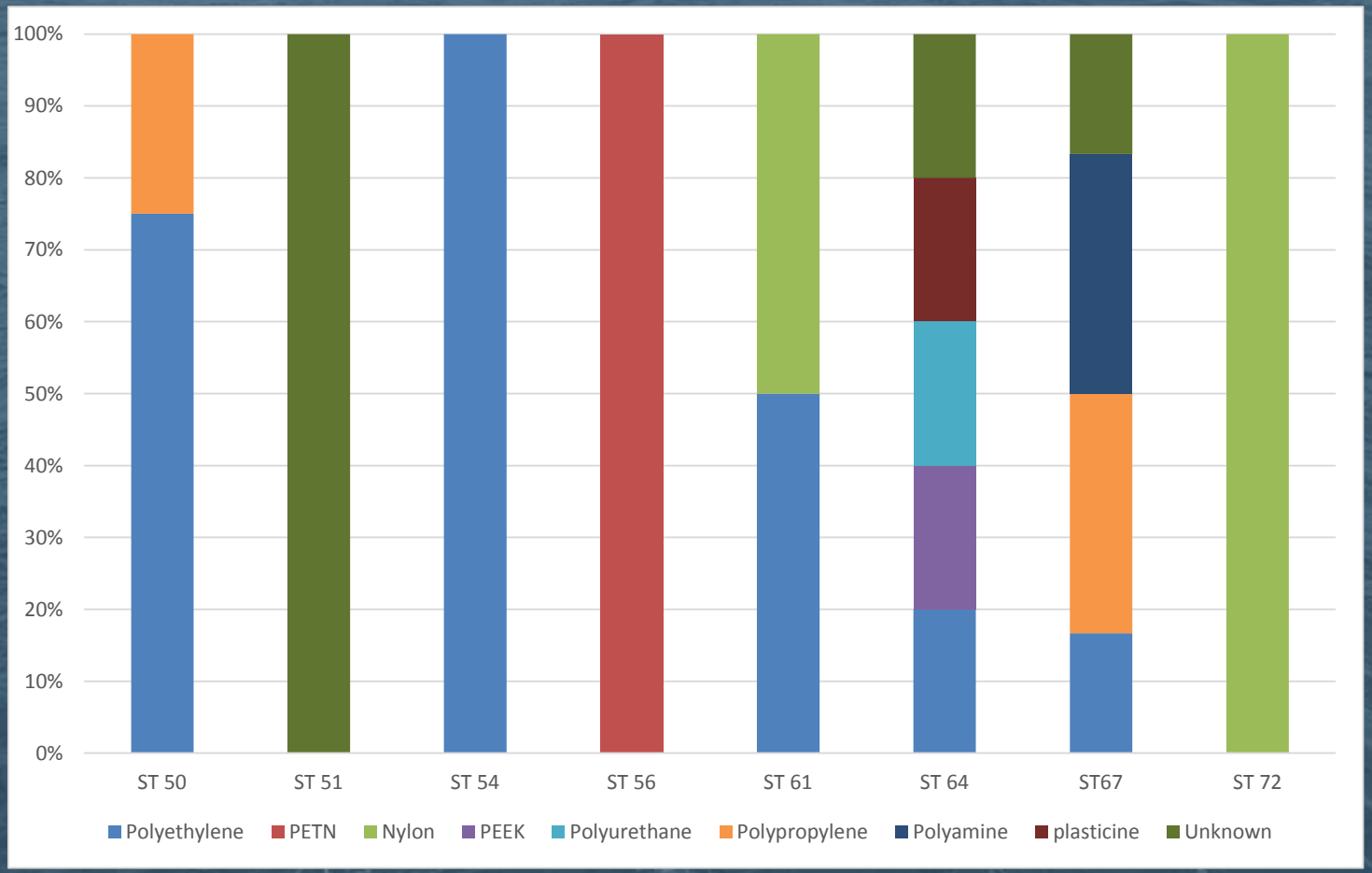


Polyethylene

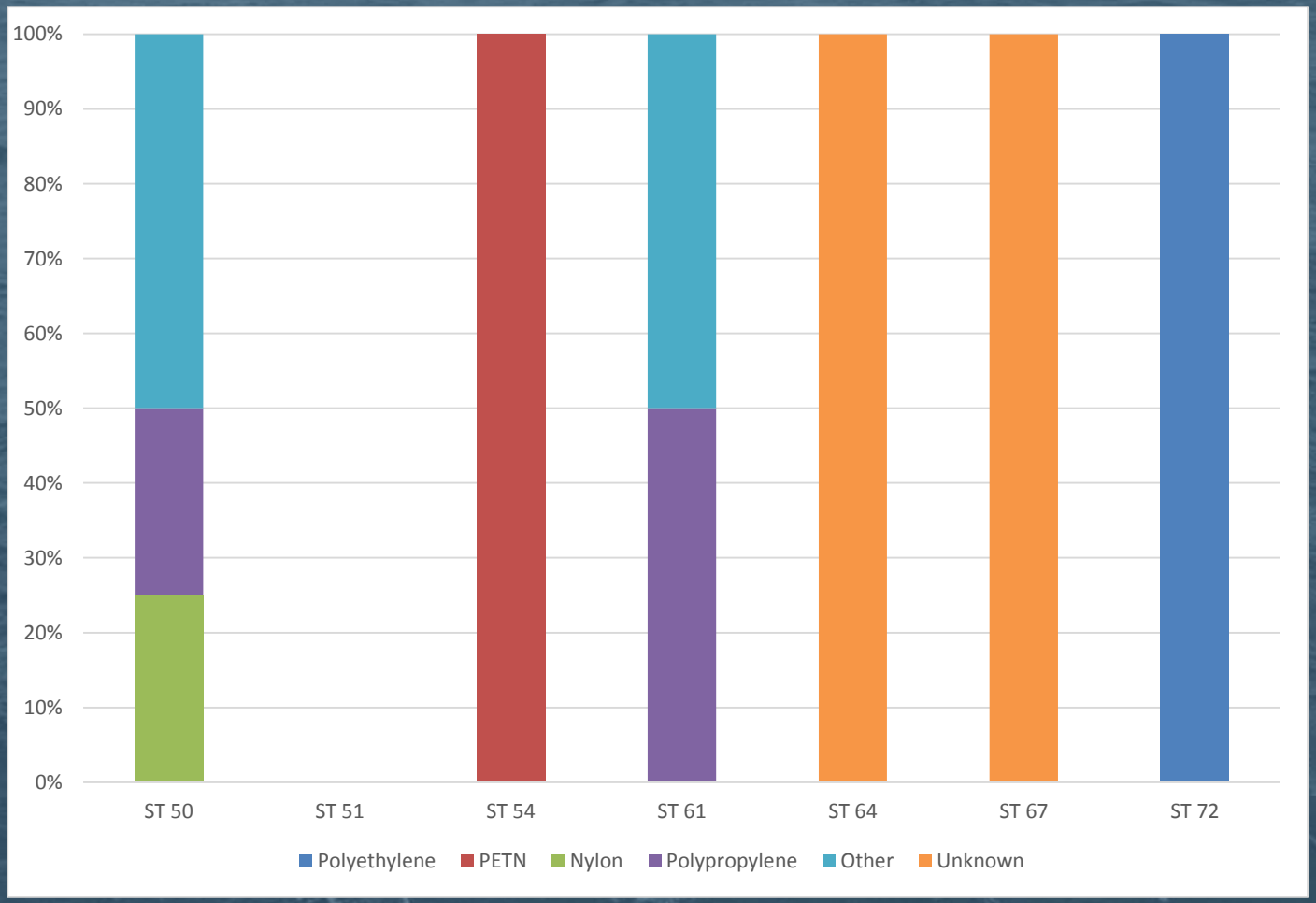
Ethylene-propylene copolymer



Accumulation rates of different microplastic types in water samples



Accumulation rates of different microplastic types in sediment samples

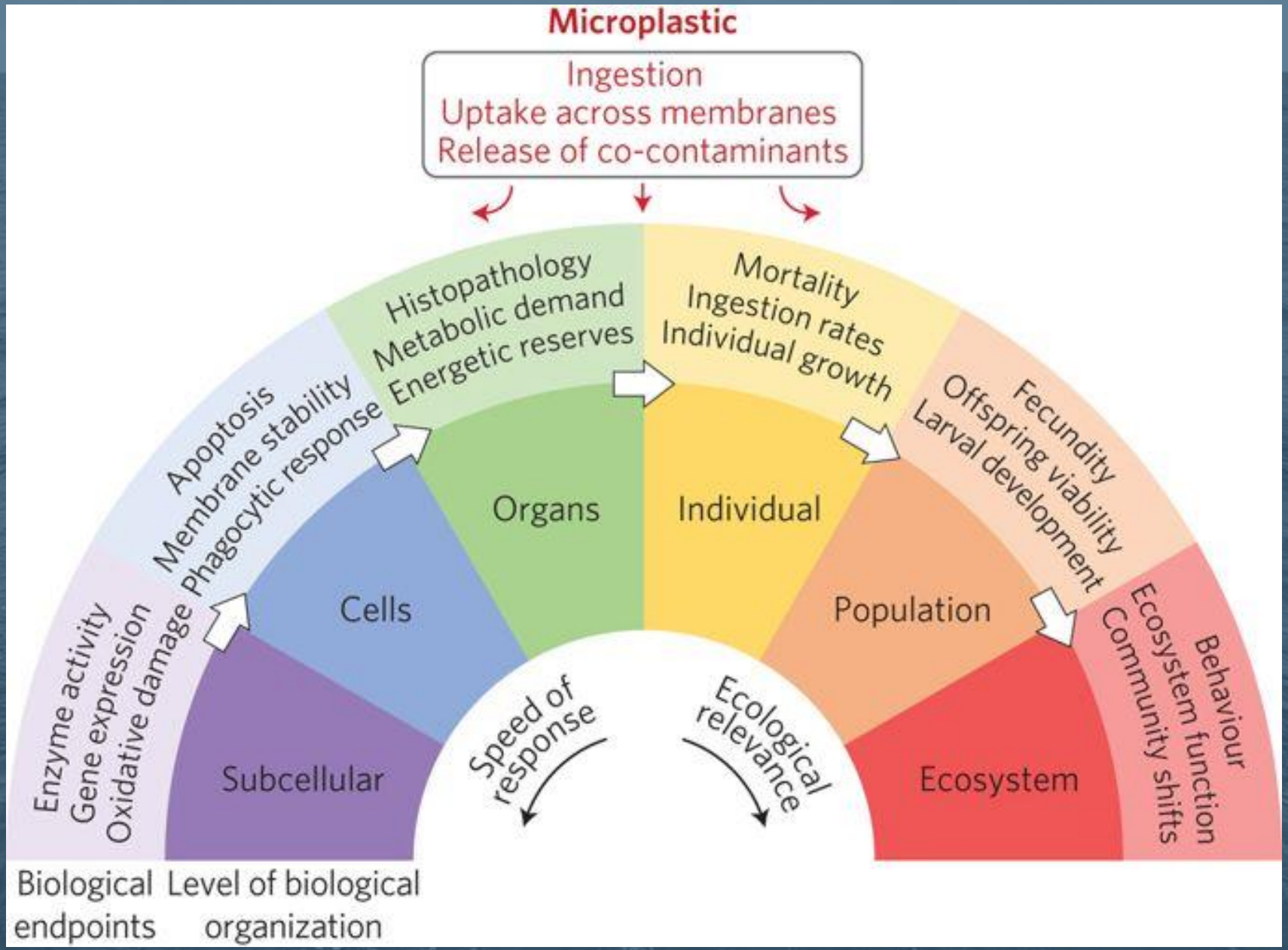


Number of microplastics found in samples in each stations

Site	MP in water	MP in sediments (kg)
Station 50	4	4
Station 51	25	0
Station 54	12	10
Station 61	3	15
Station 64	9	5
Station 67	15	10
Station 72	1	5

Revenge of our plastics gone to the ocean

What you eat is what you throw away! – W.J. Shim -



Galloway et al 2017
Nature Ecology &Evolution






KEEP ME
SEA
TRASH
FREE