Indicators for plastic monitoring – linking the value chain with environmental occurrence

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Acknowledgements

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Steering Group

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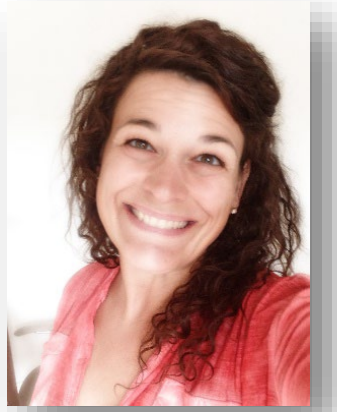
https://www.norden.org/en/publication/indicators-plastic-pollution



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SWECO

International plastic agreement

Resolution of the 5th UN Environmental Assembly:

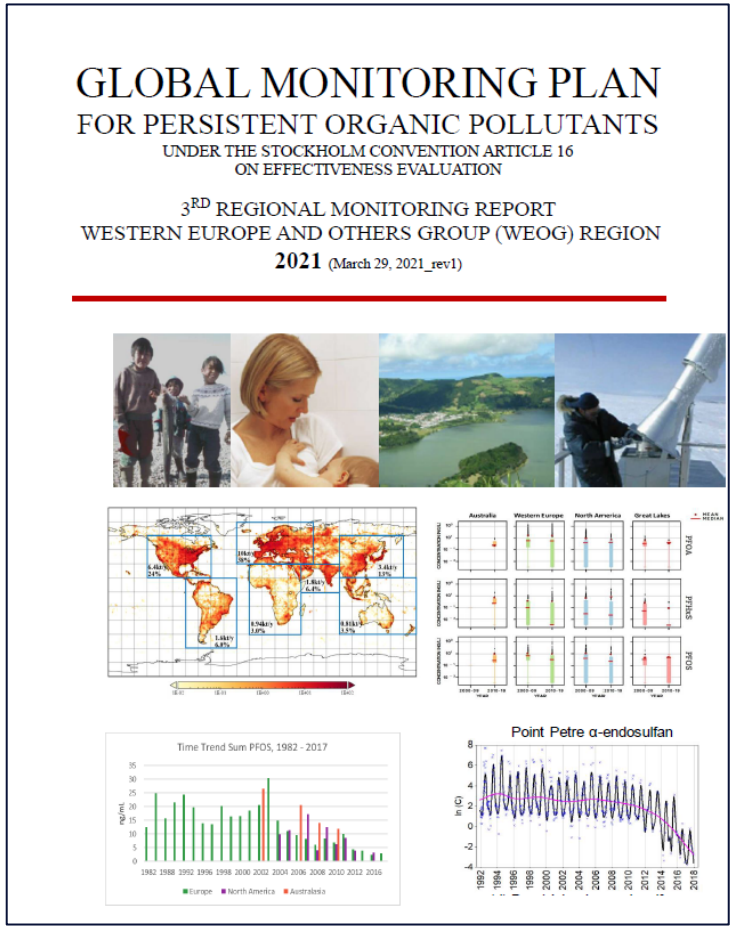
To end plastic pollution and forge an international legally binding agreement by 2024.

https://www.unep.org/news-and-stories/press-release/historic-day-campaign-beat-plastic-pollution-nations-commit-develop

Effectiveness evaluation

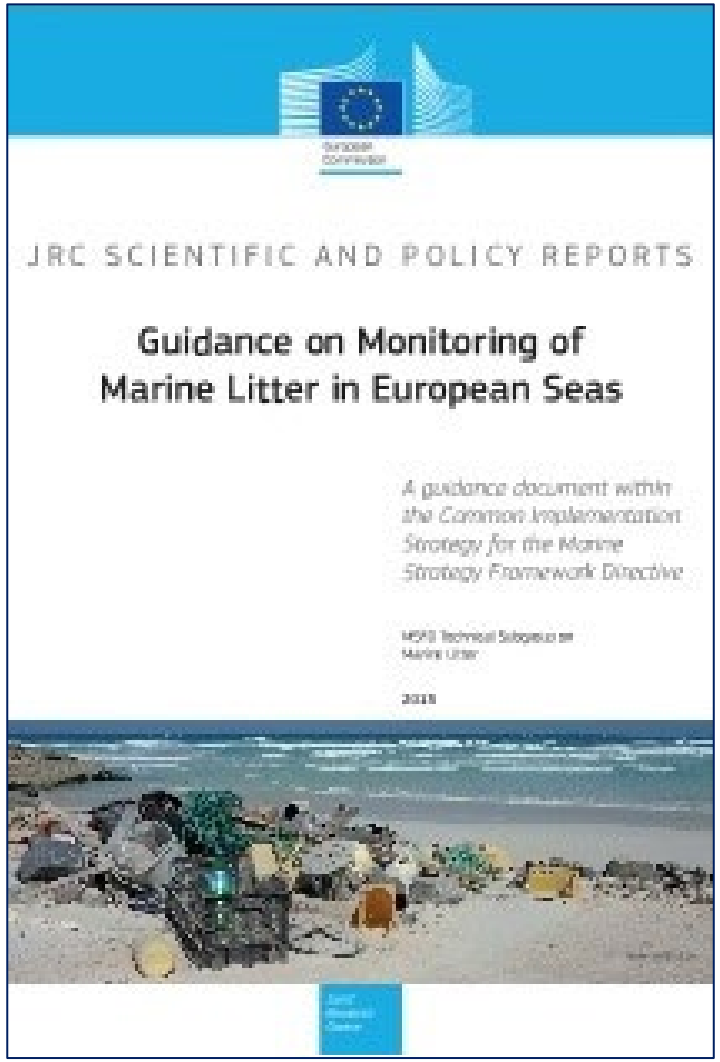
UN Stockholm Convention on Persistent Organic Pollutants (POPs)

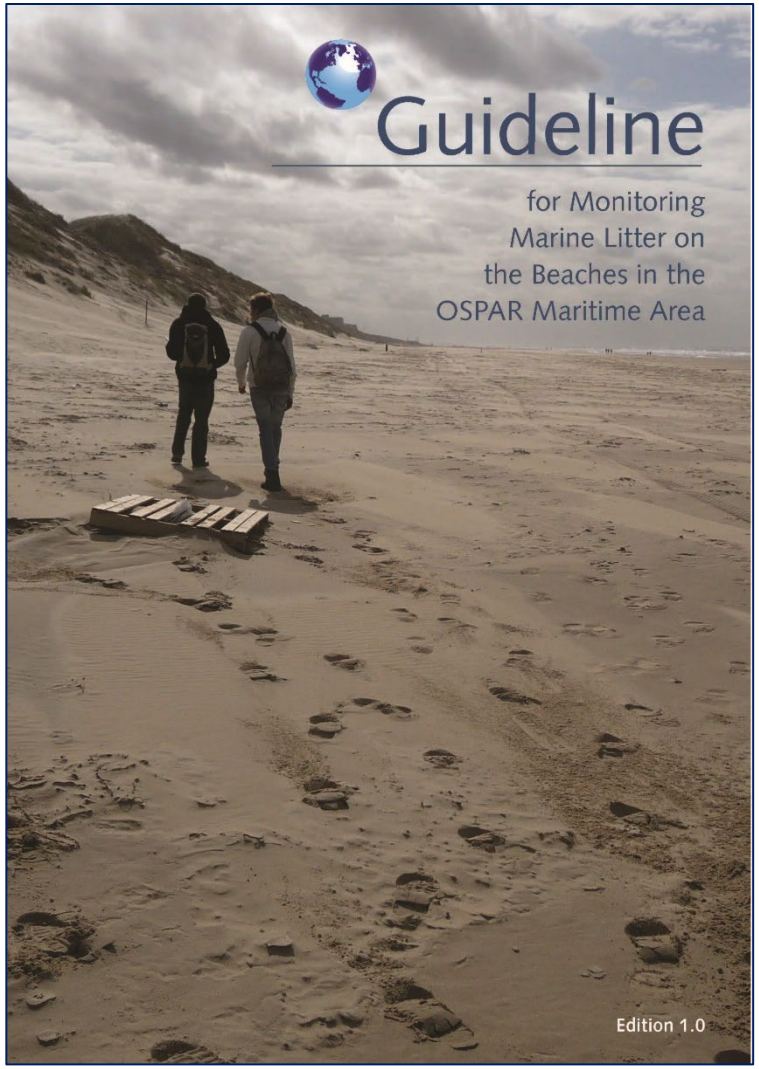
- Ambient air
- Human blood
- Human milk
- Water (PFAS)



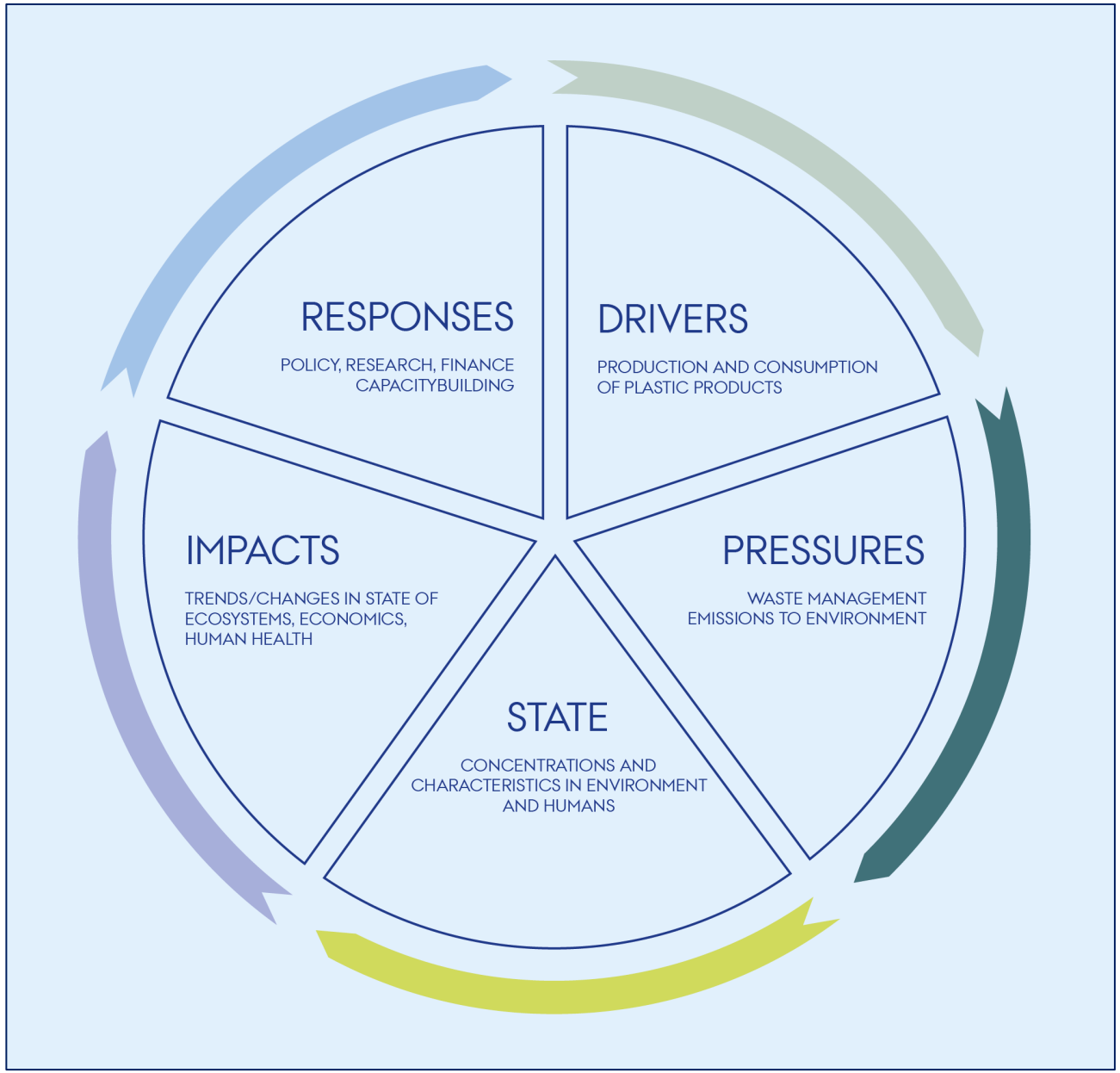
	AMAP (1975-2000)	AMAP (2000-2014)	OSPAR (1995-2014)	HELCOM (1978-2018)	Great Lakes (1970-2017)	Antarctica (NA)
Aldrin	o	o	o	o	o	o
α-HCH						
β-HCH						
Chlordane	1					
Chlordecone	o	o	o	o	o	o
DDT		1				
Dieldrin						
Endosulfan	o	o	o	o	o	o
Endrin	o	o	o	o	o	o
γ-HCH						
Heptachlor						
HBB	Δ	Δ	Δ	Δ	Δ	Δ
HBCD					3	
Hexa-, hepta-, PBDE			2	2	3	
HCB						
Mirex			o	o	o	o
PeCBz						
PFOS					3	
PCB						
PCDD						
PCDF						
Tetra-, penta-, PBDE					4	
Toxaphene		5				
HCBD						
PCP	Δ	Δ	Δ	Δ	Δ	Δ
PCNs						
DecaBDE						
SCCPs	Δ	Δ	Δ	Δ	Δ	Δ
Dicofol	Δ	Δ	Δ	Δ	Δ	Δ
PFOA, salts, related compounds						
PFHxS, salts, related compounds	Δ	Δ	Δ	Δ	Δ	Δ

What to monitor and how?

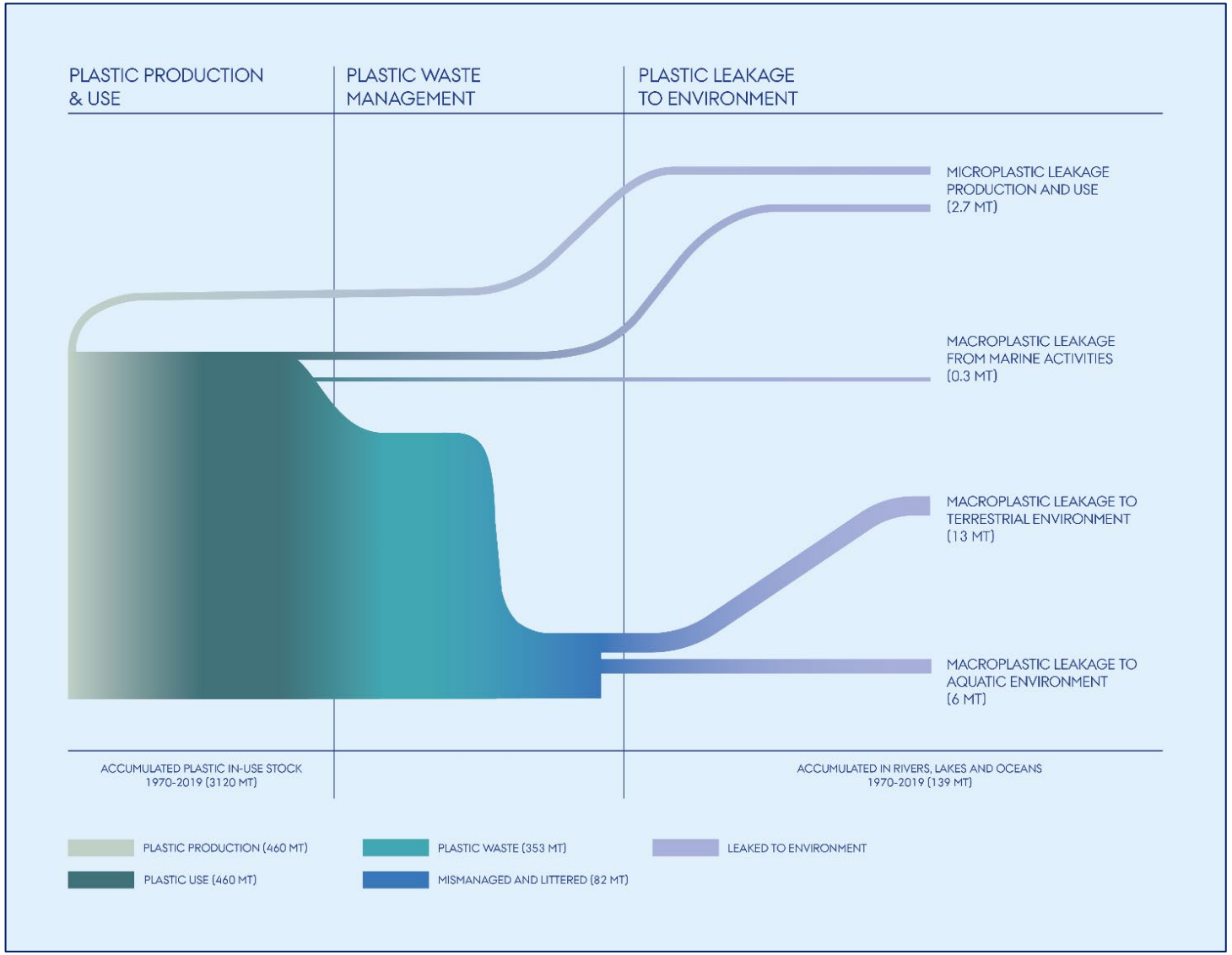




Approach

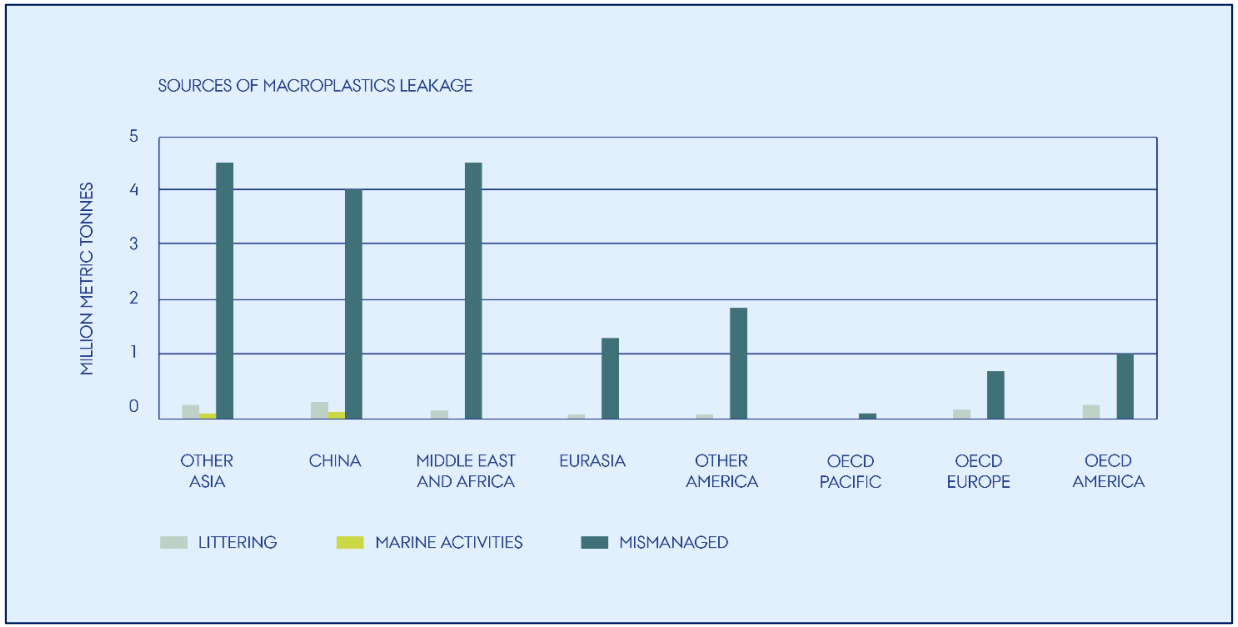

RESPONSES
POLICY, RESEARCH, FINANCE
CAPACITYBUILDING
DRIVERS
PRODUCTION AND CONSUMPTION
OF PLASTIC PRODUCTS
IMPACTS
TRENDS/CHANGES IN STATE OF
ECOSYSTEMS, ECONOMICS,
HUMAN HEALTH
PRESSURES
WASTE MANAGEMENT
EMISSIONS TO ENVIRONMENT
STATE
CONCENTRATIONS AND
CHARACTERISTICS IN ENVIRONMENT
AND HUMANS

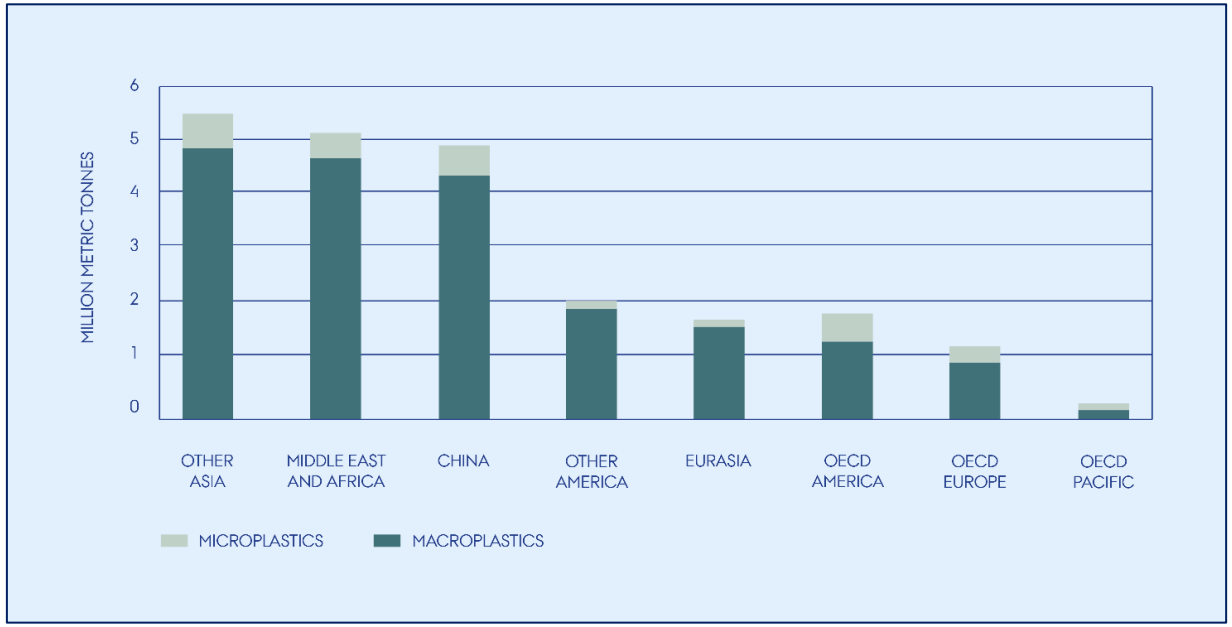
Drivers and pressures – losses along the value chain



Based on OECD (2022). Global Plastic Outlook. https://www.oecd-ilibrary.org/environment/global-plastics-outlook_de747aef-en

Sources of plastics in the environment





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Losses from marine activities

Activity	Comment
Fisheries	~ 6% of fishing nets and ~ 20% of lines lost. Data skewed towards the northern hemisphere. Priority for FAO, UNEP, IMO
Aquaculture	Little information, no requirement to record gear losses Estimates of annual losses from 3000-40,000 tons in Europe
Shipping	Waste and sewage regulated by MARPOL (IMO) Waste mismanagement may occur. ~ 3000 containers lost every year
Offshore facilities	No estimates available
Recreational fishing	No estimates available

Little information compared to losses from land-based sources

Some new indicators to consider?

Tyre abrasion

- Significant source of microlitter and chemical additives
- Could be combined with wastewater or river measurements

Abandoned, lost, discarded fishing gear

- Risk of ecological impacts in the marine environment
- Included in beach litter indicator?

Container losses

- Maritime shipping is increasing
- Not directly related to plastics

Wastewater effluents

- Connection between land and sea
- Could be combined with other wastewater studies?

Riverine inputs

- Connection between land and sea, for litter and microplastics
- Potential for alignment with beach litter

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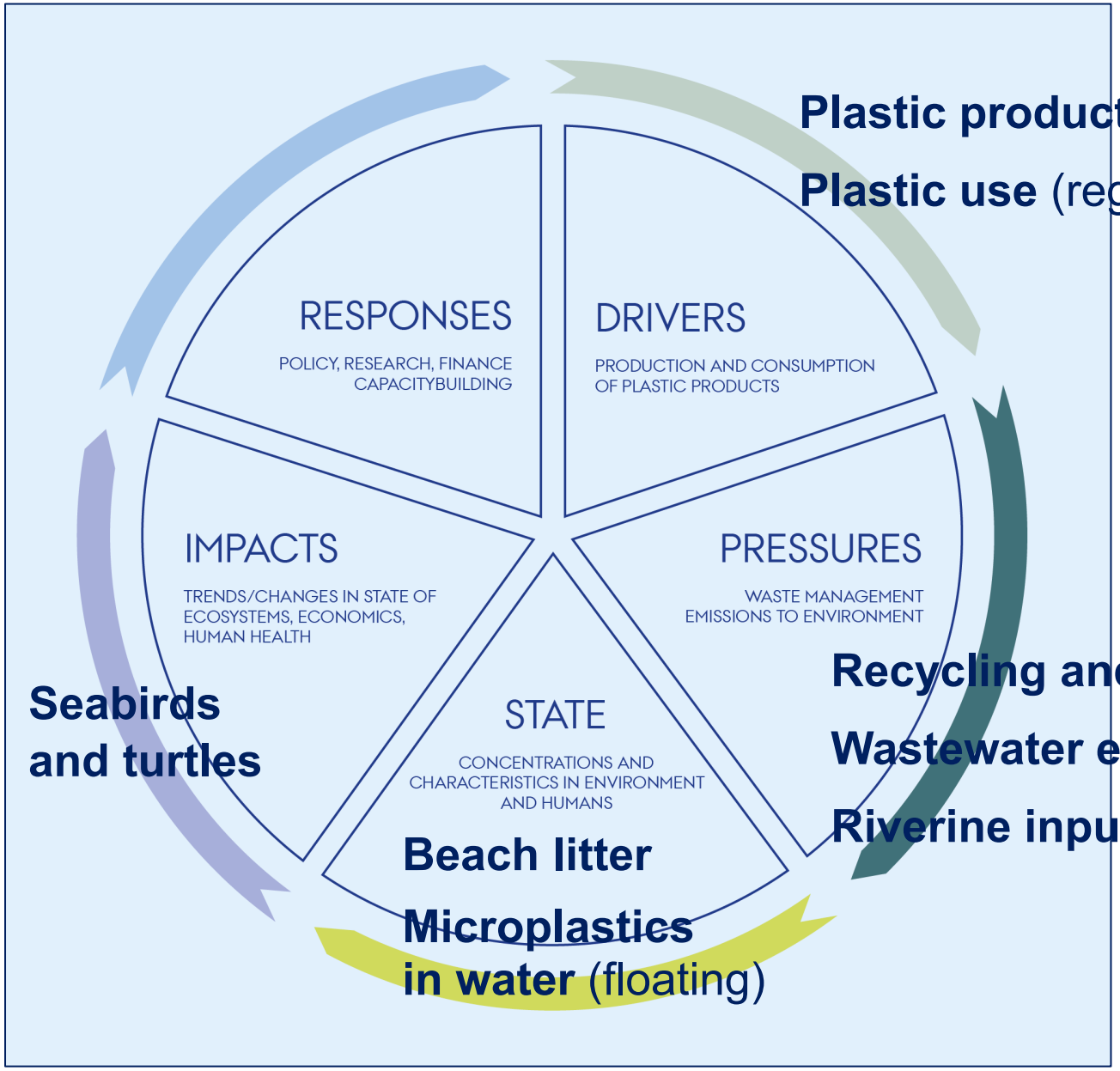
Recommendations



Plastic production (global)

Plastic use (regional/national)

Recycling and incineration rates

Wastewater effluents

Riverine inputs

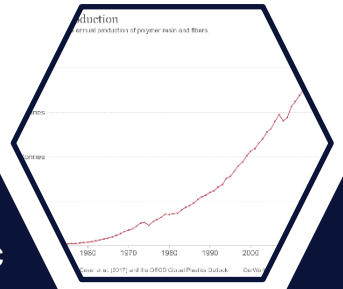
Seabirds and turtles

Beach litter

Microplastics in water (floating)

Outlook

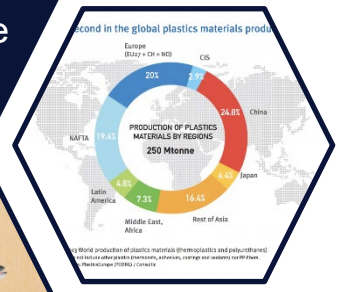
More holistic approach needed



Reporting – comparable units, databases

Capacity building at the global scale

Global, regional, local balance

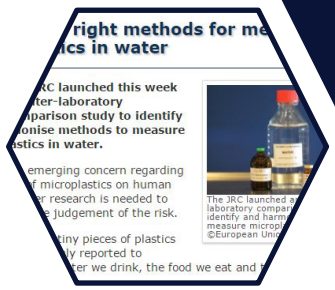


Awareness, individual responsibility

Standardi-zation and harmoni-zation

Consistency within an indicator

Research



Picture: Mike Dotta/Shutterstock; https://www.azocleantech.com/; Bo Eide; https://plastic-pollution.org/ ; PlasticsEurope; https://www.4ocean.com/ ; Abreu & Pedrotti (2020), Microplastics in the oceans: The solutions lie on land. Field Actions Science Reports, Special Issue 19; https://journals.openedition.org/factsreports/5290?lang=fr

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