



Microplastics in the Salish Sea

with Implications to South Sound

Prof. Julie Masura

*Sciencing the Sh*t Out of South Sound!*

Microplastics in Salish Sea – Plastic Pollution



ELAW BULLETIN

Environmental Law Alliance Worldwide

Saying No to Single-Use Plastic in Indonesia



British diver Rich Homer captured shocking images of himself swimming through a sea of plastic rubbish off the coast of Bali ([The Guardian, March 6, 2018](#)).



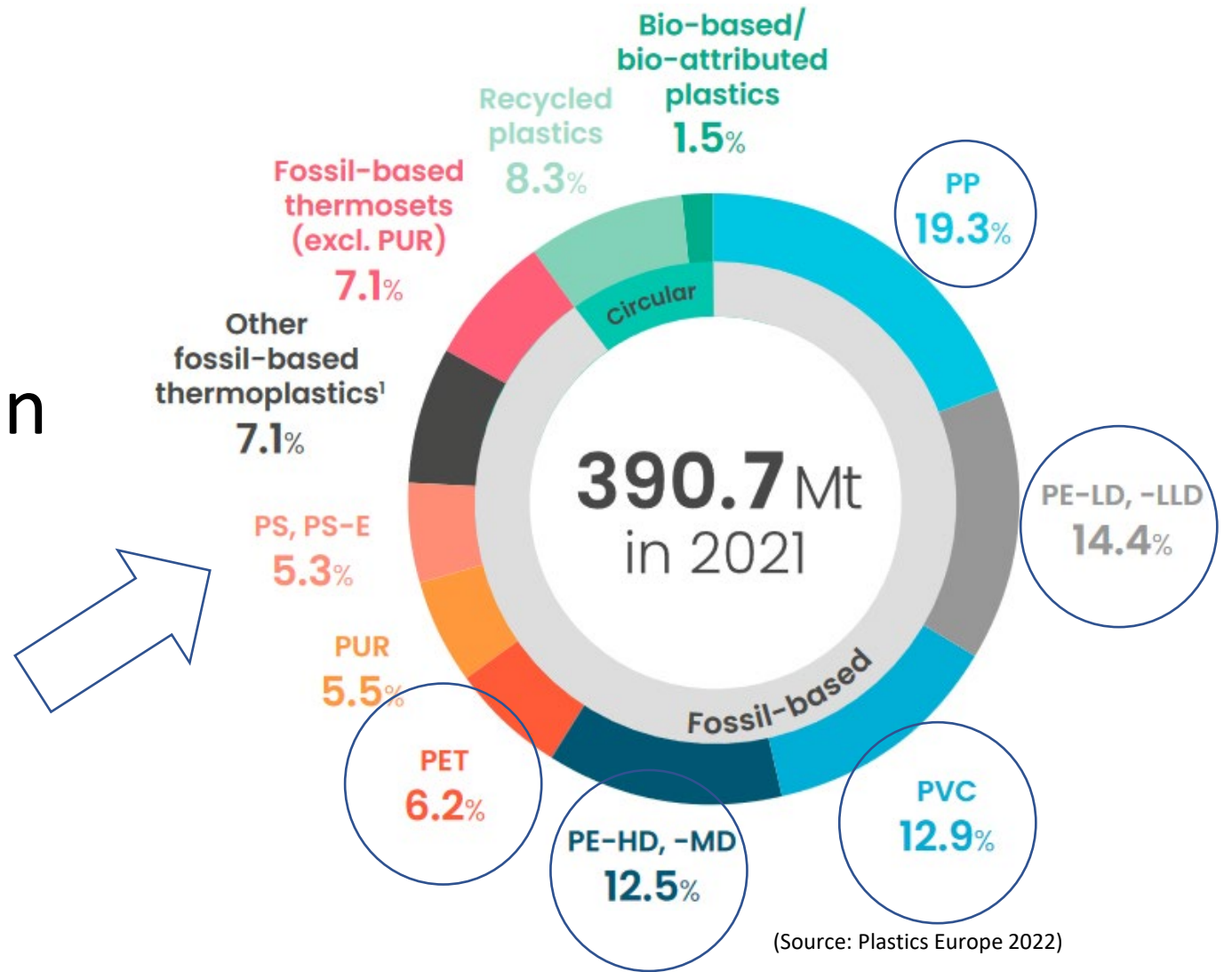
Microplastics in Salish Sea - Outline

- Microplastics – definition
- Microplastics – source
- Microplastics – fate & transport
- Microplastics – toxicity



Microplastics in Salish Sea - Definition

World Plastics Production
18.0% U.S.



Microplastics in Salish Sea - Definition

Classification	Size
Megaplastics	> 100 mm
Macroplastics	5 - 100 mm
Microplastics	1 nm – 5mm
Nanoplastics	< 1nm



Toxicology Work



(Source: Shutterstock)



(Source: NOAA)



(Source: Shutterstock)



Microplastics in Salish Sea - Definition

PRIMARY



SECONDARY

(Source: NOAA)

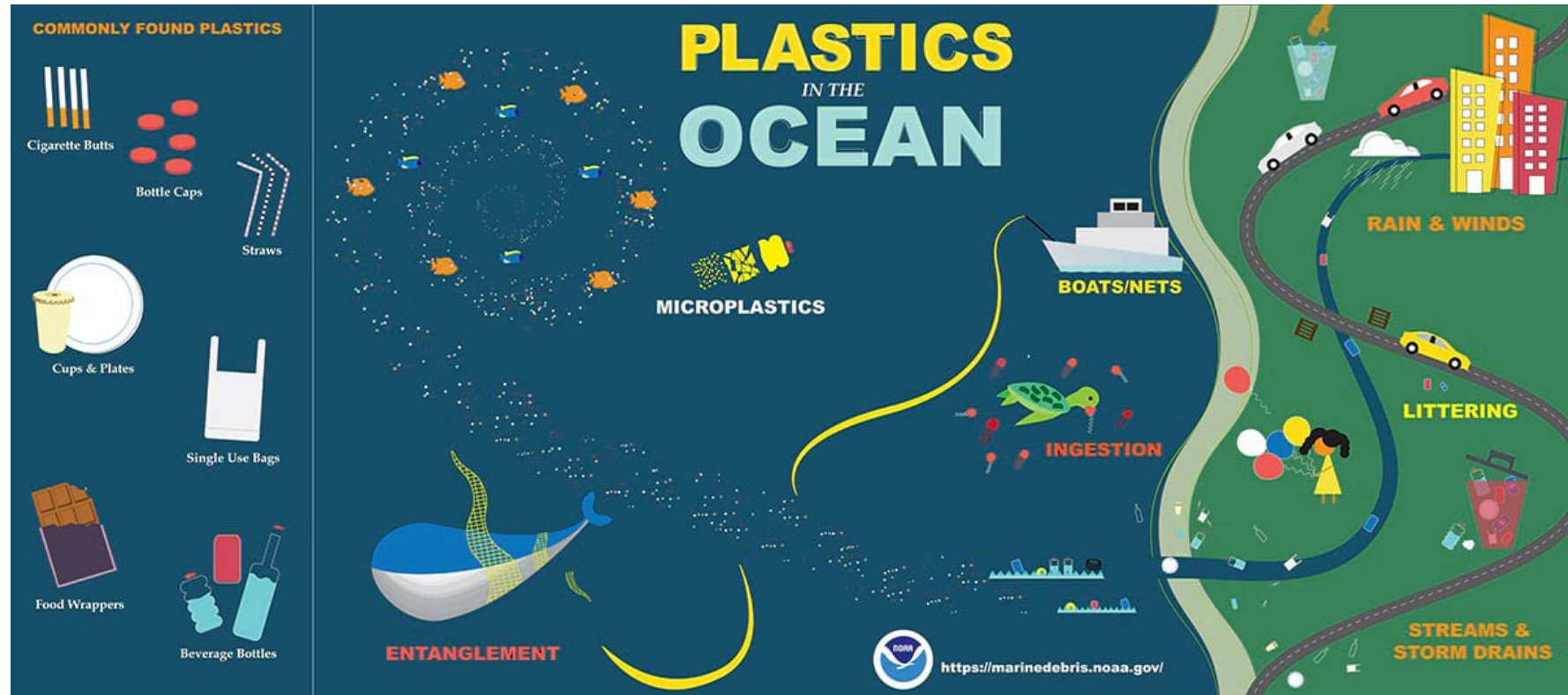
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Microplastics in Salish Sea - Source

Primary	Secondary
Land	Ocean
Air	
Water	
Sediments	



(Source: NOAA)



COMMONLY FOUND PLASTICS



Cigarette Butts



Bottle Caps



Straws



Cups & Plates



Single Use Bags



Food Wrappers



Beverage Bottles

PLASTICS IN THE OCEAN

MICROPLASTICS

BOATS/NETS

INGESTION

ENTANGLEMENT

RAIN & WINDS

LITTERING

STREAMS & STORM DRAINS



<https://marinedebris.noaa.gov/>

W

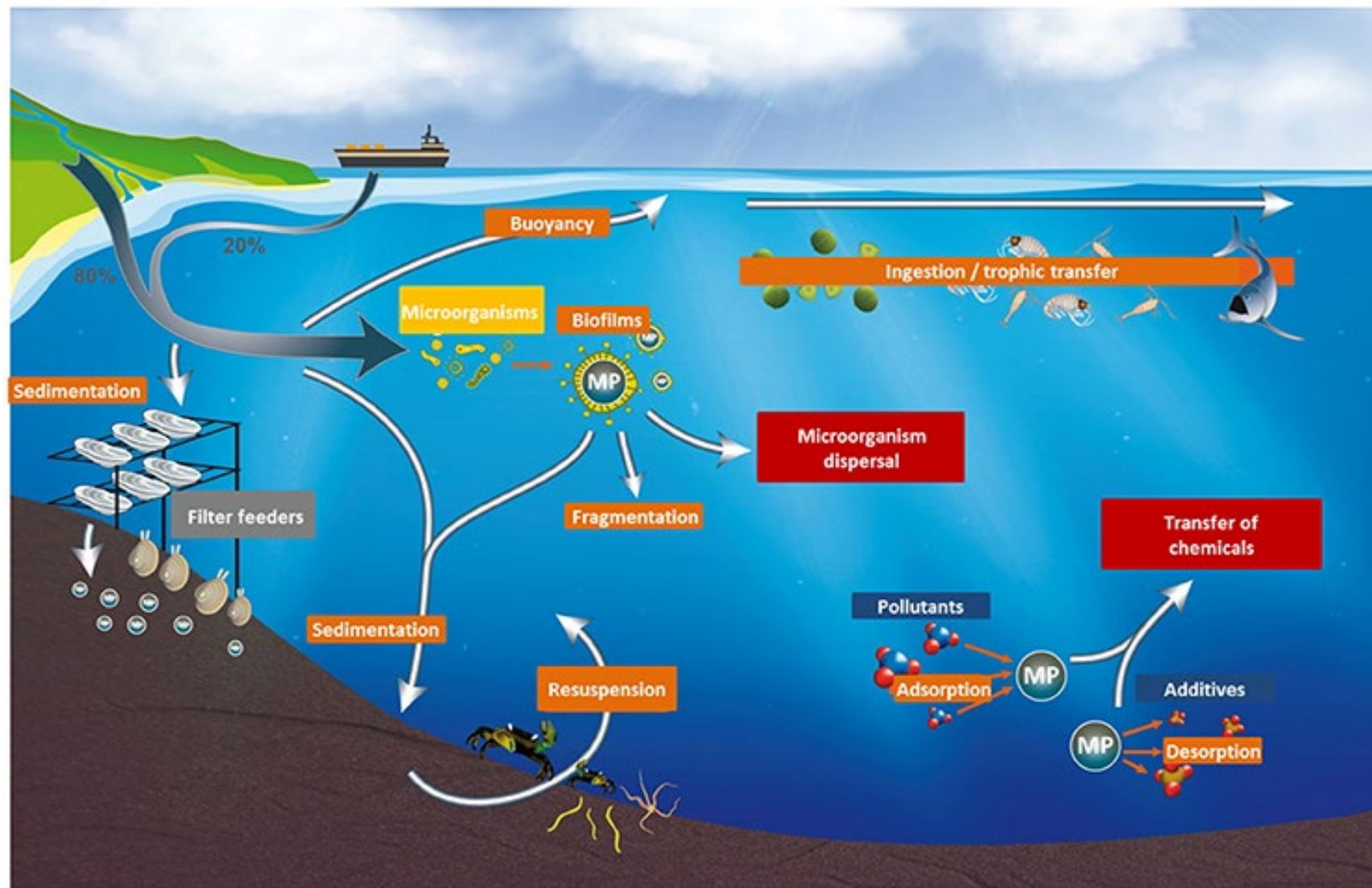
(Source: NOAA)

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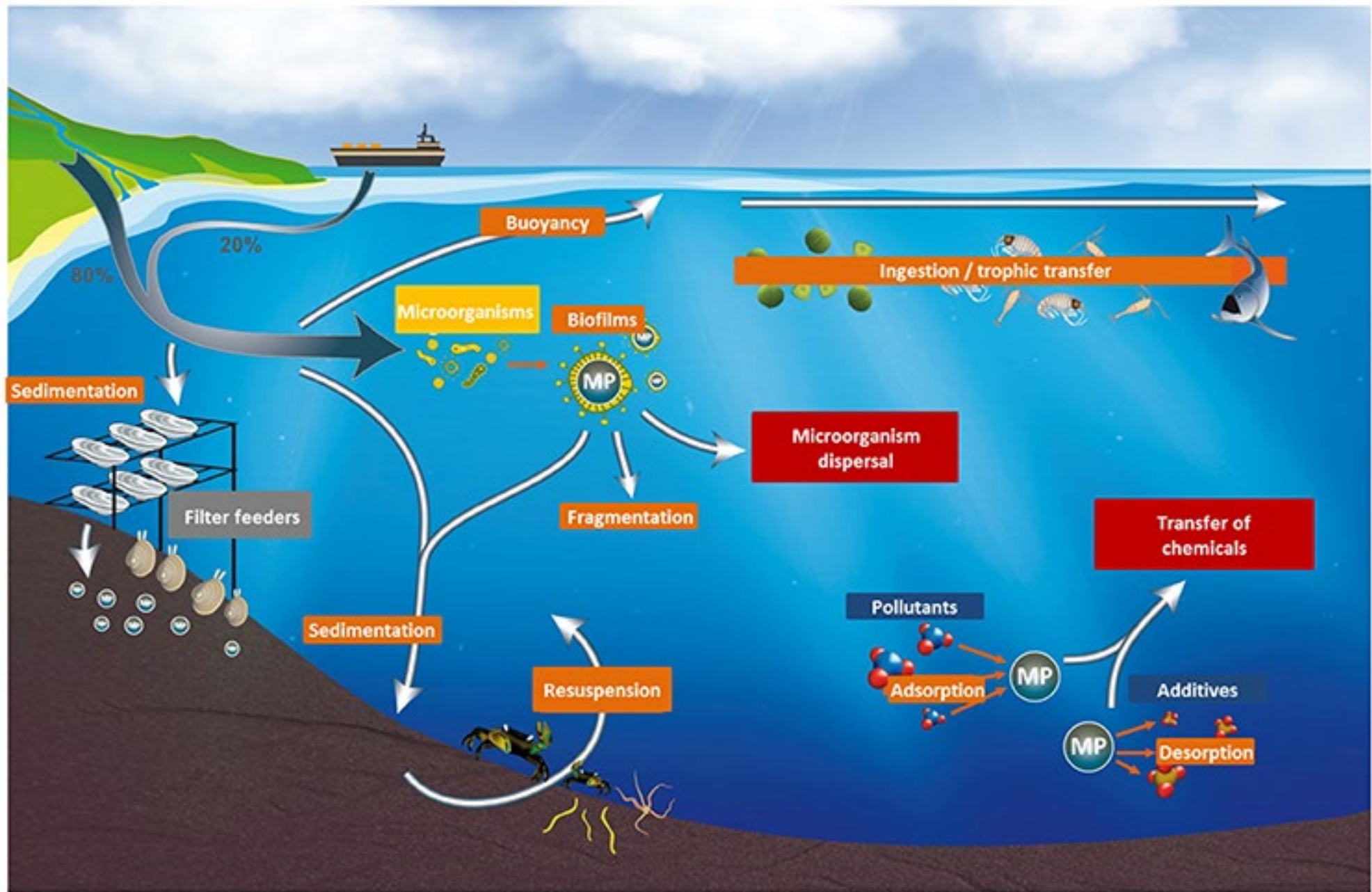


Microplastics in Salish Sea – Fate & Transport



(Source: Paul-Pont et al. 2018)





(Source: Paul-Pont et al. 2018)



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Microplastics in Salish Sea - Toxicity

- Low reactivity
- Adsorption & desorption
- Impacts
 - False satiation
 - Clog gut
 - Toxic transfer??



Source: NOAA



Microplastics in Salish Sea - Toxicity

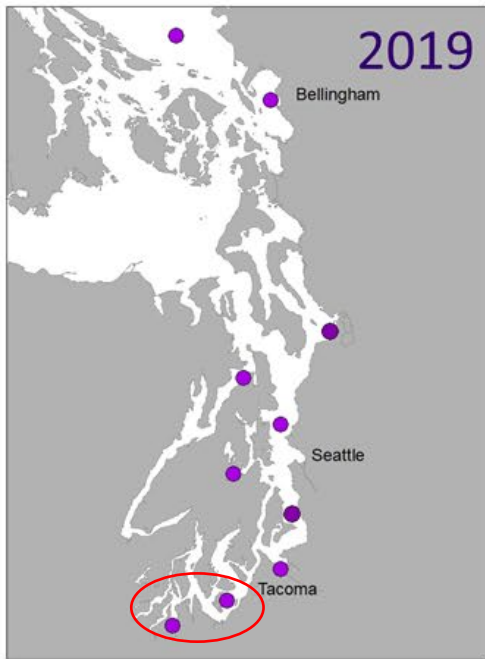
- Are Microplastics Harmful to Humans?

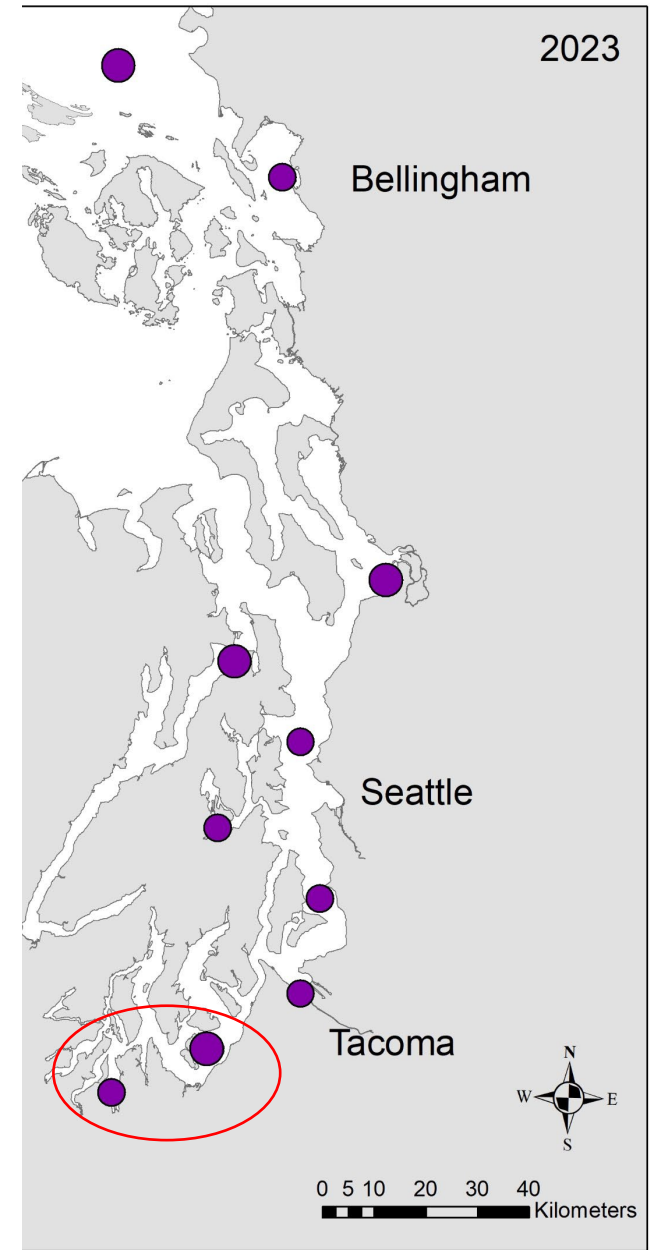
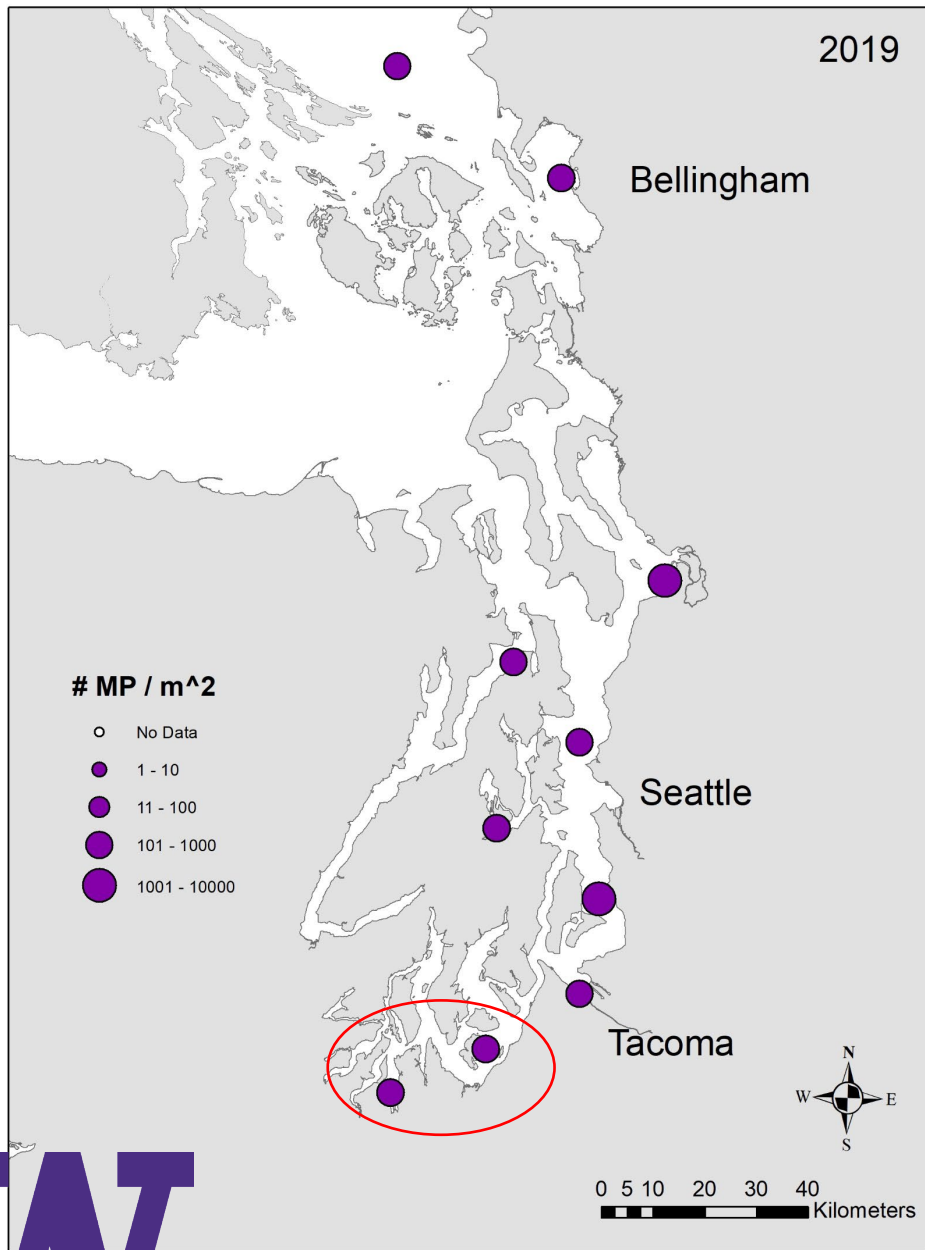


Microplastics in Salish Sea - Monitoring

- **Washington Department of Ecology Partnership**
- **Puget Sound Ecosystem Monitoring Program (PSEMP)**
 - Collaborative
 - Long-term Yearly Monitoring
 - Marine Waters
 - Over 50 stations
- **2014-2024 – 10 stations**







Microplastics in Salish Sea – Quick Facts

	Overall	South Puget Sound	Year(s)
Average	3228	3165	2014-2023
Minimum	0	0	2017
Maximum	27171	19131	2017

- No samples from 2020.
- Samples in process from 2022.
- No significant increase/decrease from these data points over years.
 - Patchy
 - Highly-variable.



Microplastics in Salish Sea – Plastic Pollution

