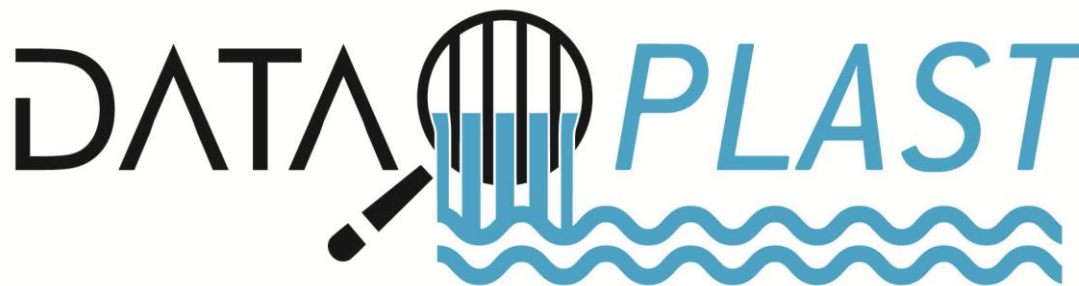




Marine litter in the North Sea: sources, impact on human health and environment

Romain Tramoy
(LEESU, UPEC)



Plastic pollution in the Ocean as an emerging concern

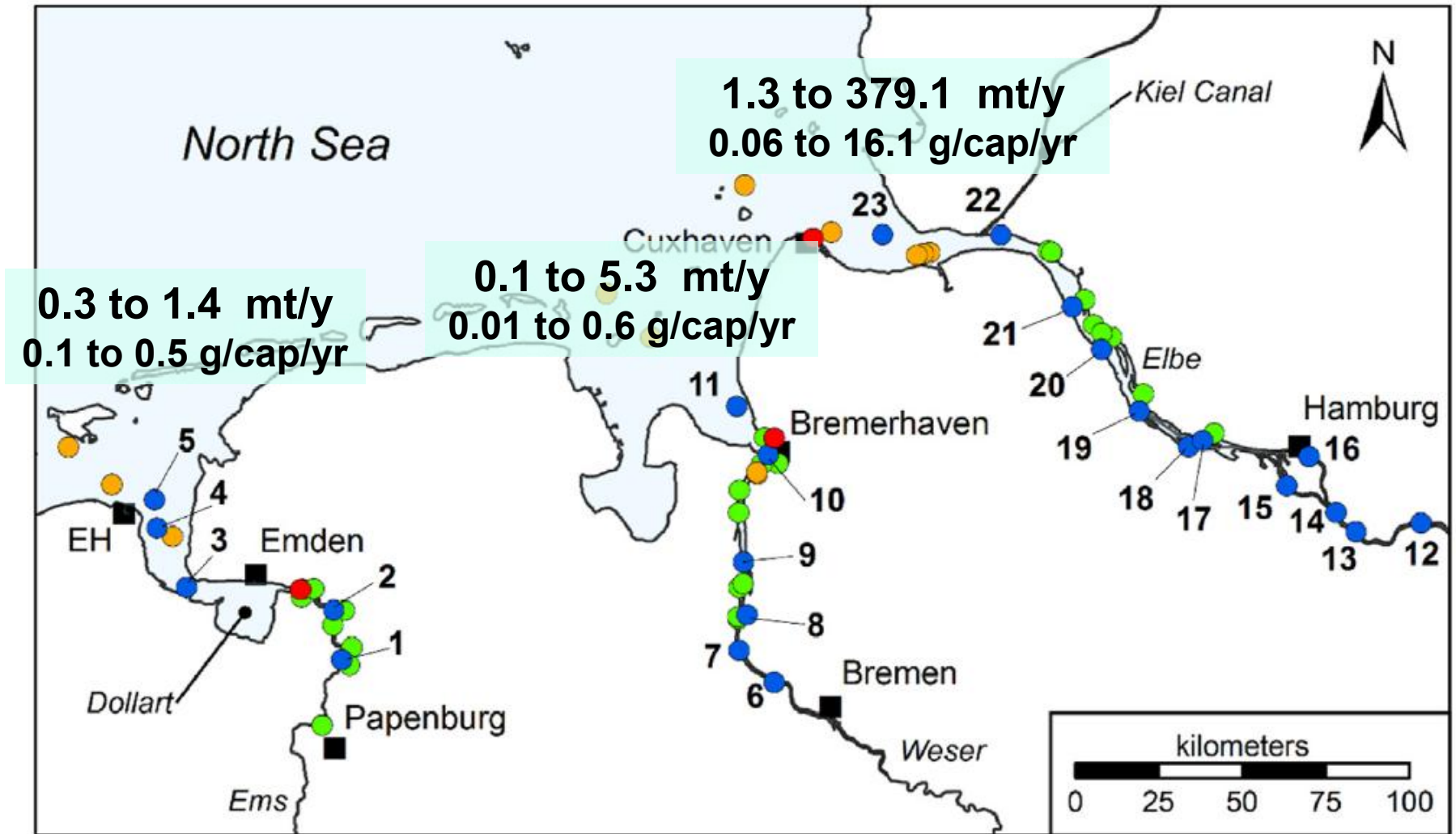


The Great Pacific Garbage Patch

Captain Charles Moore

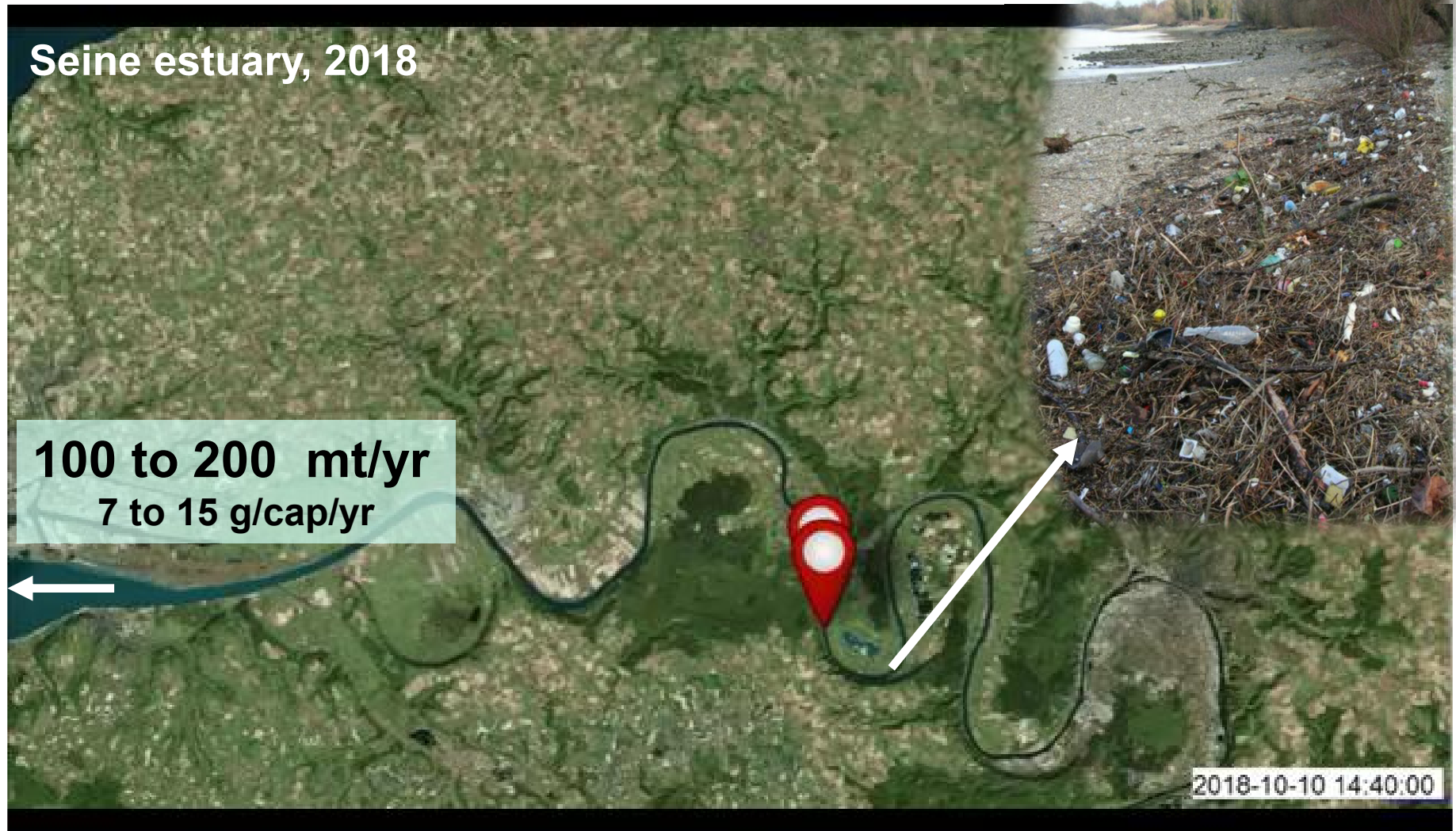
Going upstream: rivers...

Macroplastic emitted to the North Sea, based on field data



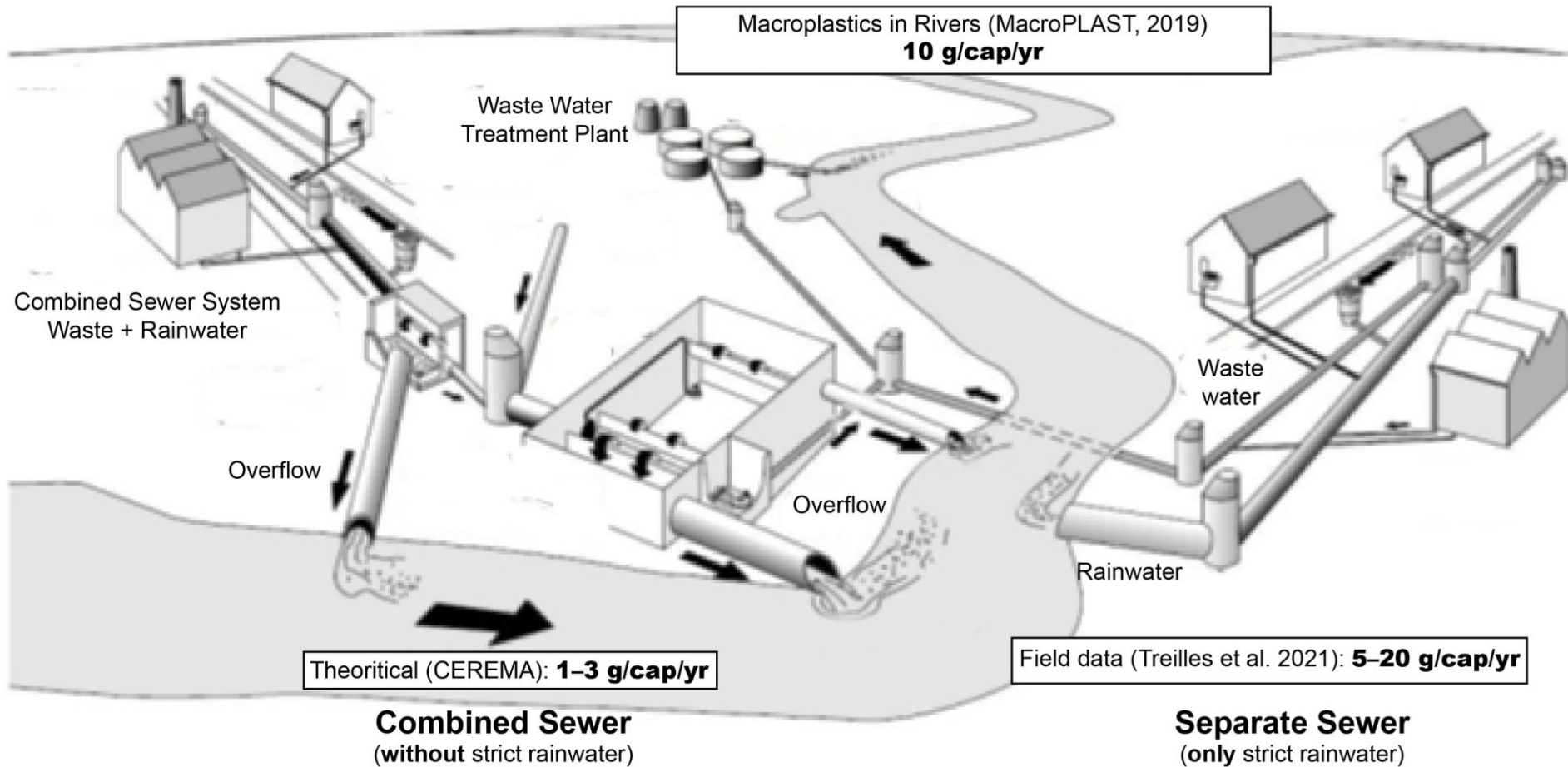
Schöneich-Argent et al. 2020 (corrigendum), *Environmental Pollution*

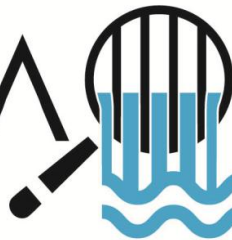
Chaotic transfer dynamics: temporary storage on riverbanks



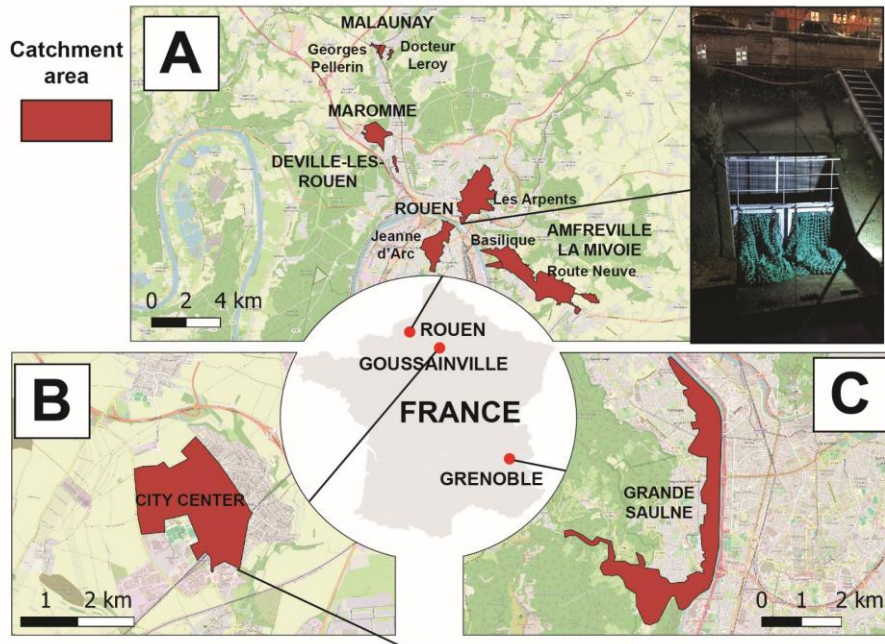
Tramoy et al. 2020, *Marine Pollution Bulletin*

Plastics: where they come from ? Go upstream again: sewer systems...



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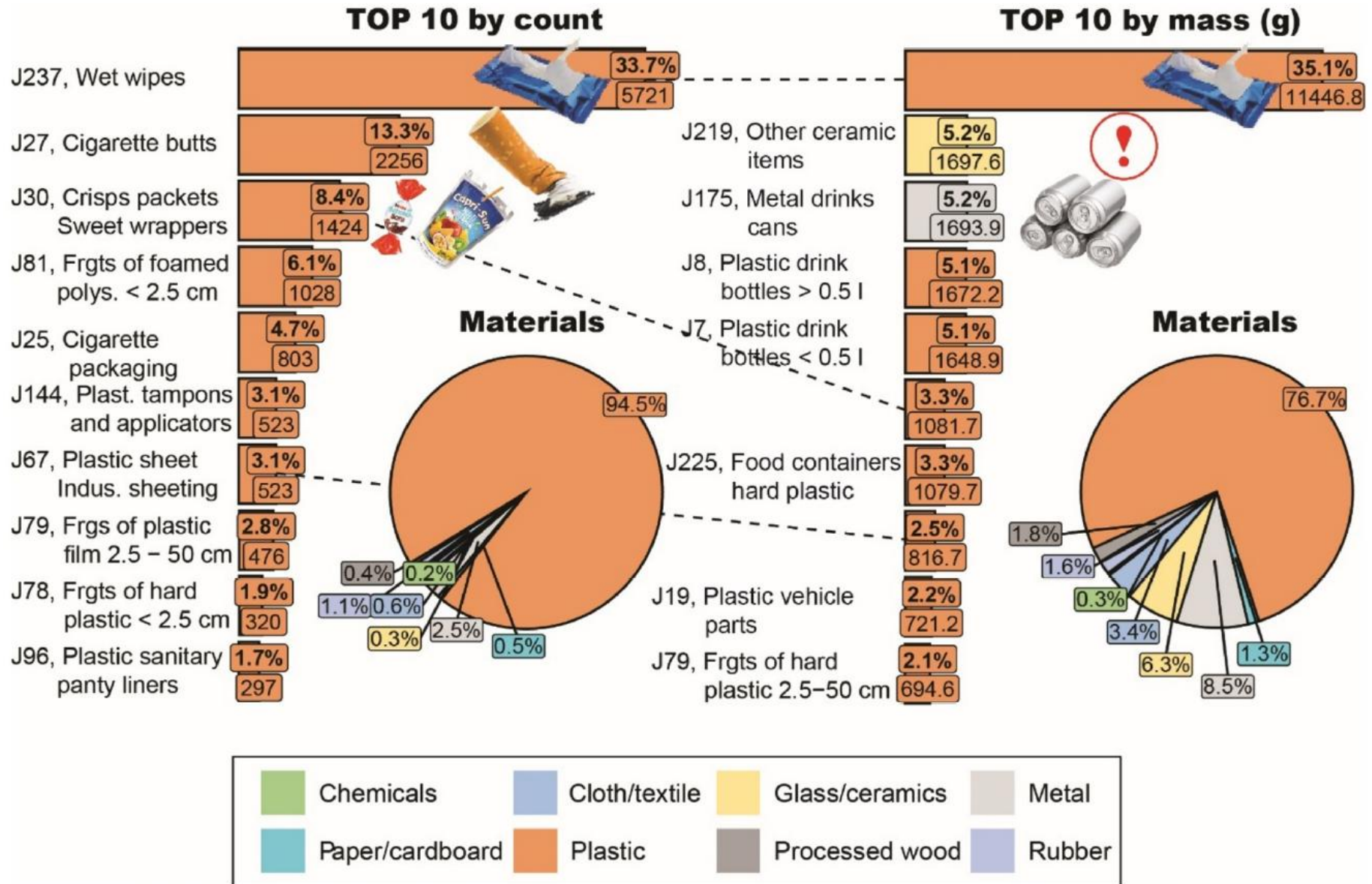
Plastics: where they come from ?



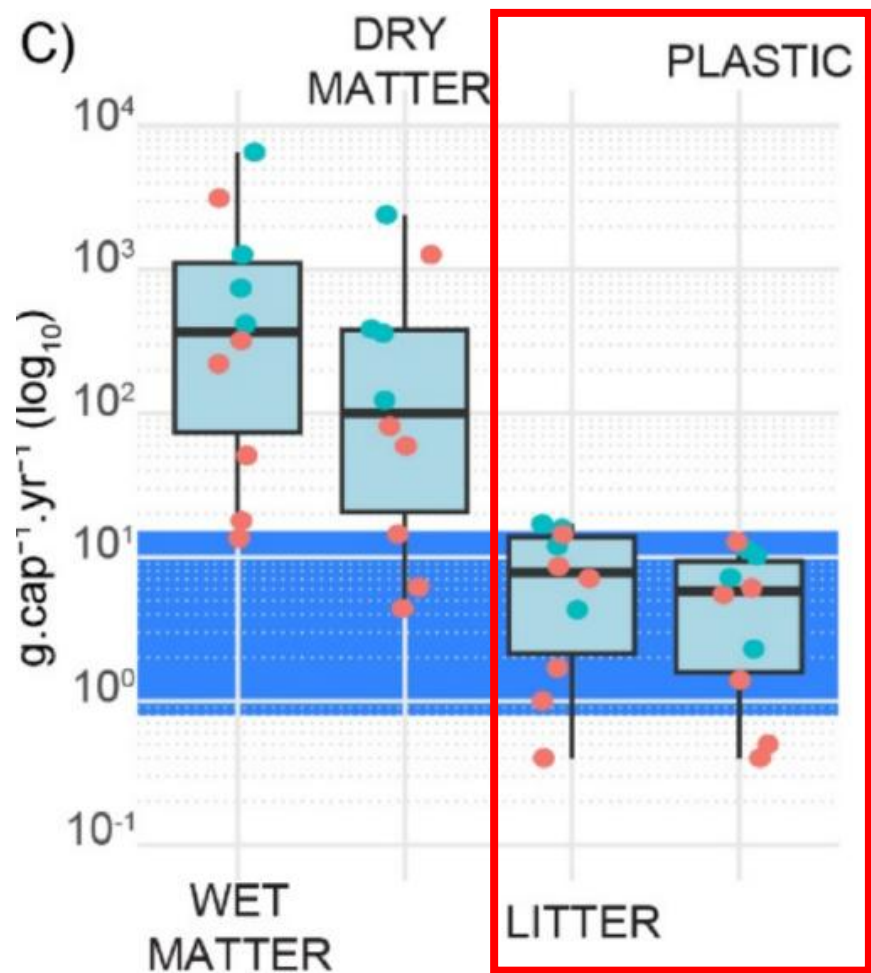
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Typical combined sewer system... n = 16,983 items



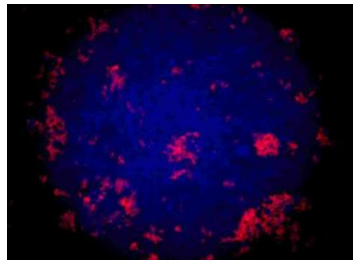
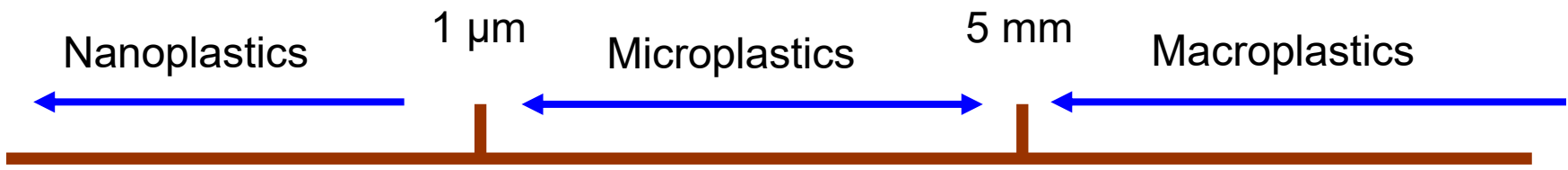
Plastic loading rates similar to rivers, but not exactly the same items found.



Wet wipes as additional loading ?

Why plastics are an environmental issue ?

Continuum of size and shape



Continuum of impacts

Micropollutants dissemination, pathogenes, alien species



HIGH RISK



Microplastics found in human blood for first time

Exclusive: The discovery shows the particles can travel around the body and may lodge in organs

The
Guardian

Microplastic discovery in penises raises erectile dysfunction questions

The contaminants have also recently been found in testes and semen amid concerns about falling male fertility

Microscopic plastics could raise risk of stroke and heart attack, study says

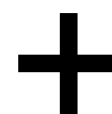
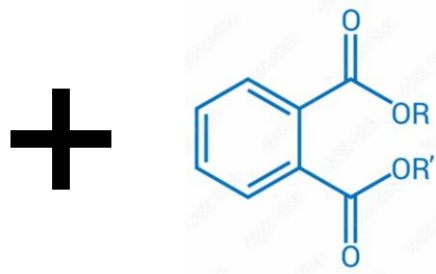
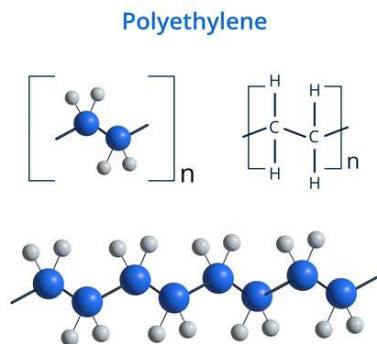
Scientists link tiny particles in blood vessels with substantially higher risk of death



Increasing health studies !
Increasing global panic ?

Mapping the chemical complexity of plastics (Maclus et al. 2025)

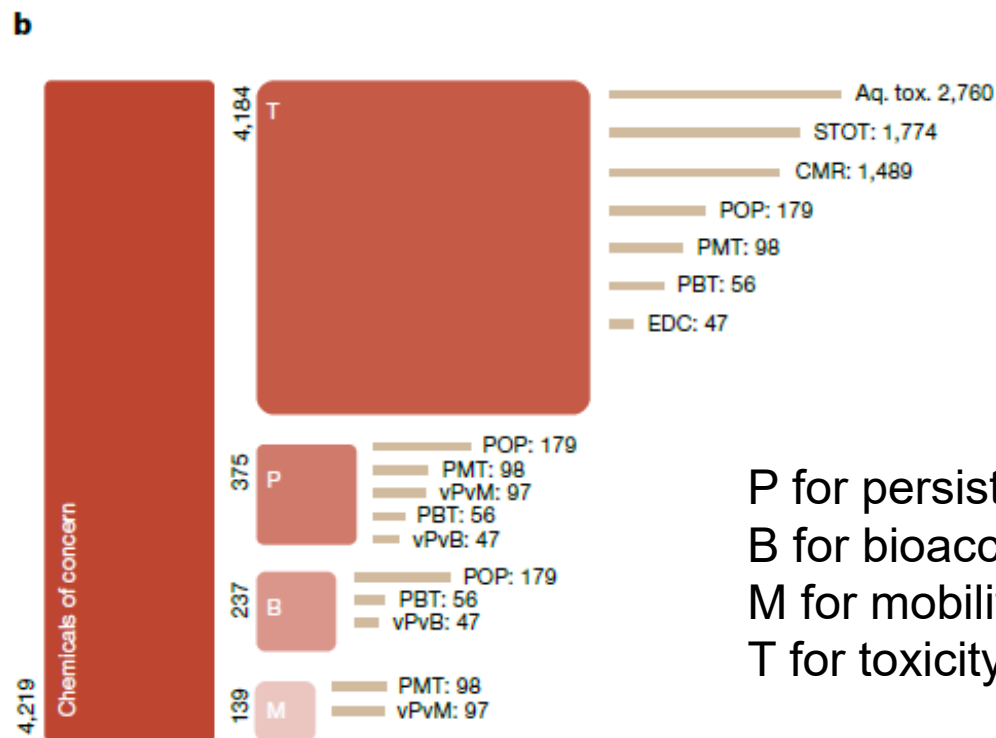
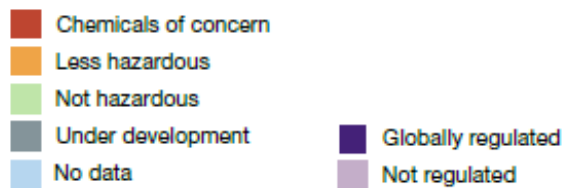
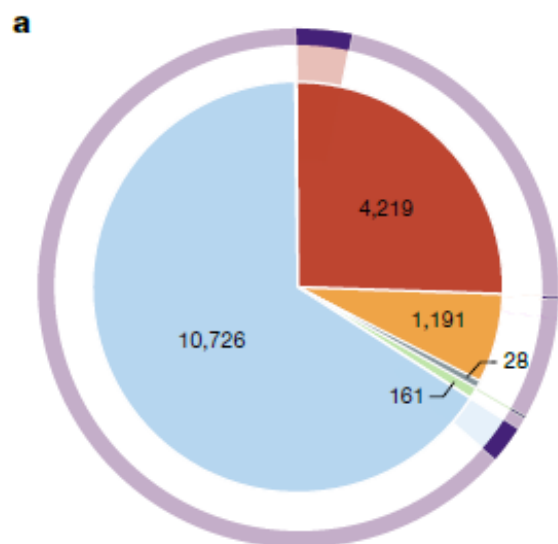
Plastic is not an inert material !



Polymers

Additives (e.g. phthalates)

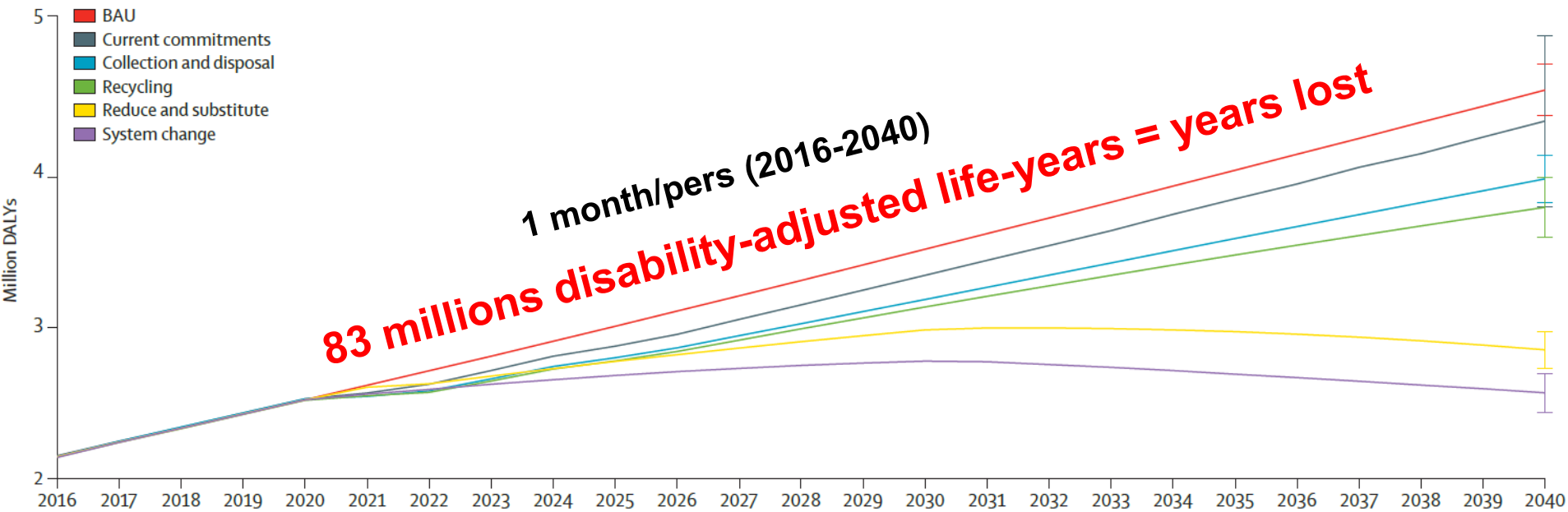
Fillers



P for persistence
B for bioaccumulation
M for mobility
T for toxicity

Impact on human health ?!

The Lancet: Global health burdens of plastics (Deeney et al. 2026)



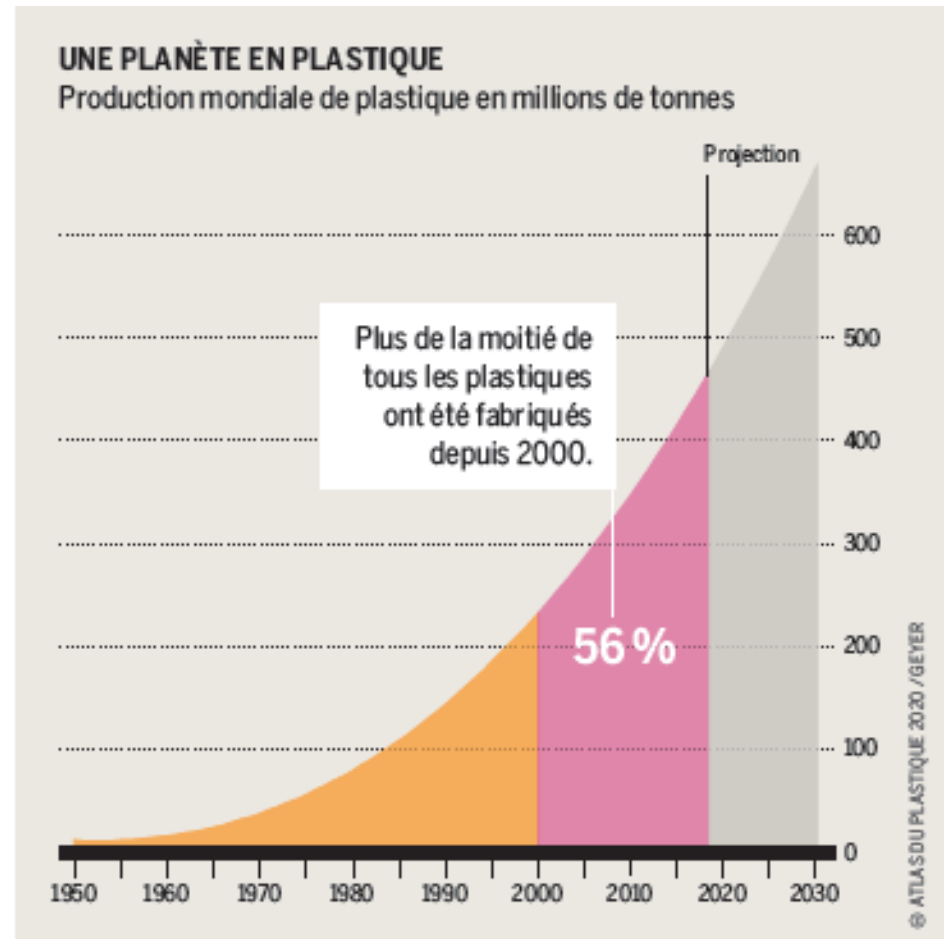
Microplastics and chemicals not accounted for !

Economist Leonardo Trasande, counting for economic impact of chemicals in plastics:

“ We estimate \$249 billion in plastic-attributable disease burden in 2018 “ in the US

Journal of the Endocrine Society: Chemicals Used in Plastic Materials: An Estimate of the Attributable Disease Burden and Costs in the United States (Trasande et al. 2024)

Plastic pollution as a growing concern as the production increases

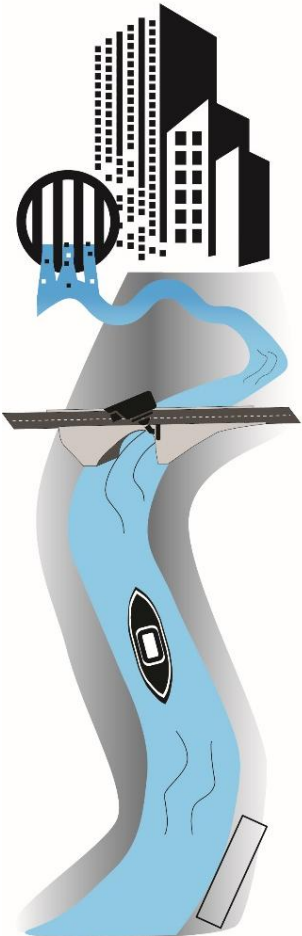


Here is the upstream...
> 50 kg/cap/yr (France) consumed

Indicators



Market
Production



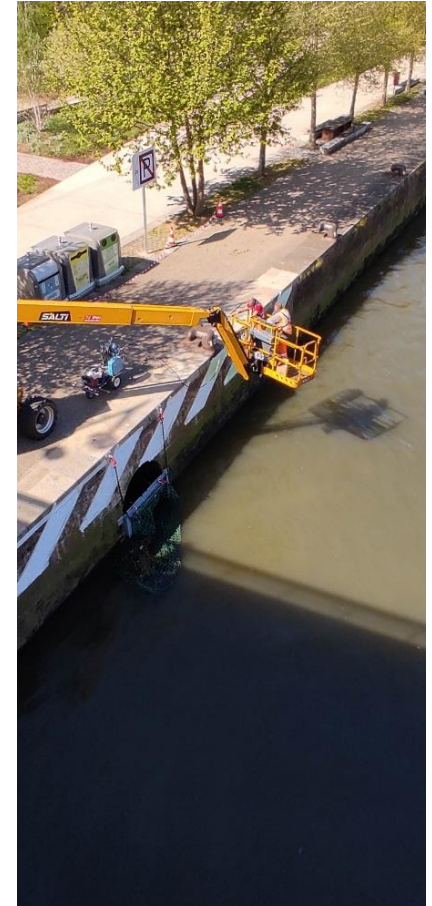
Cities
Litter sources

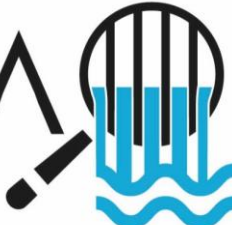
Rivers
Litter transfer

Shorelines
Litter sink



Thank you very much



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