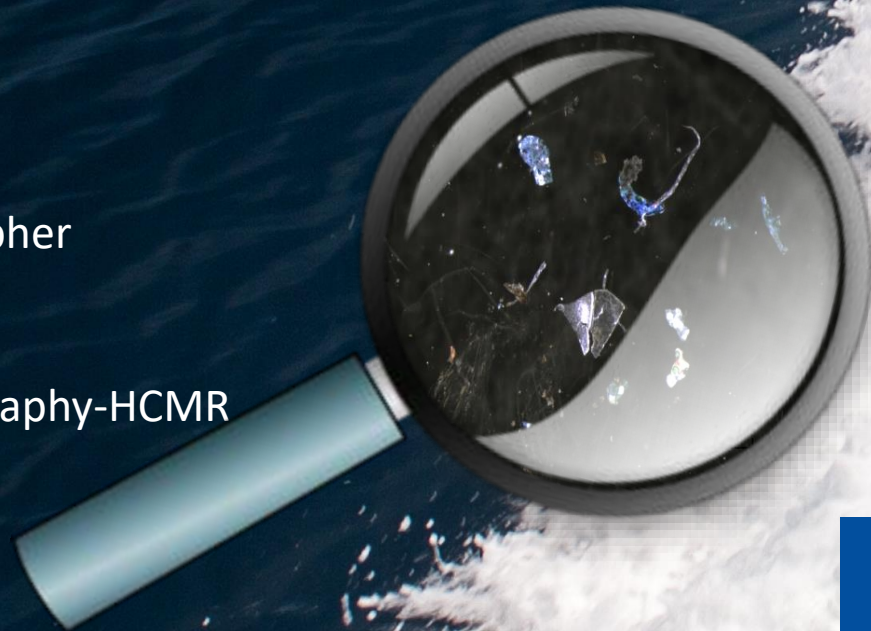


The Mediterranean Sea: a hot spot area for marine litter and microplastics

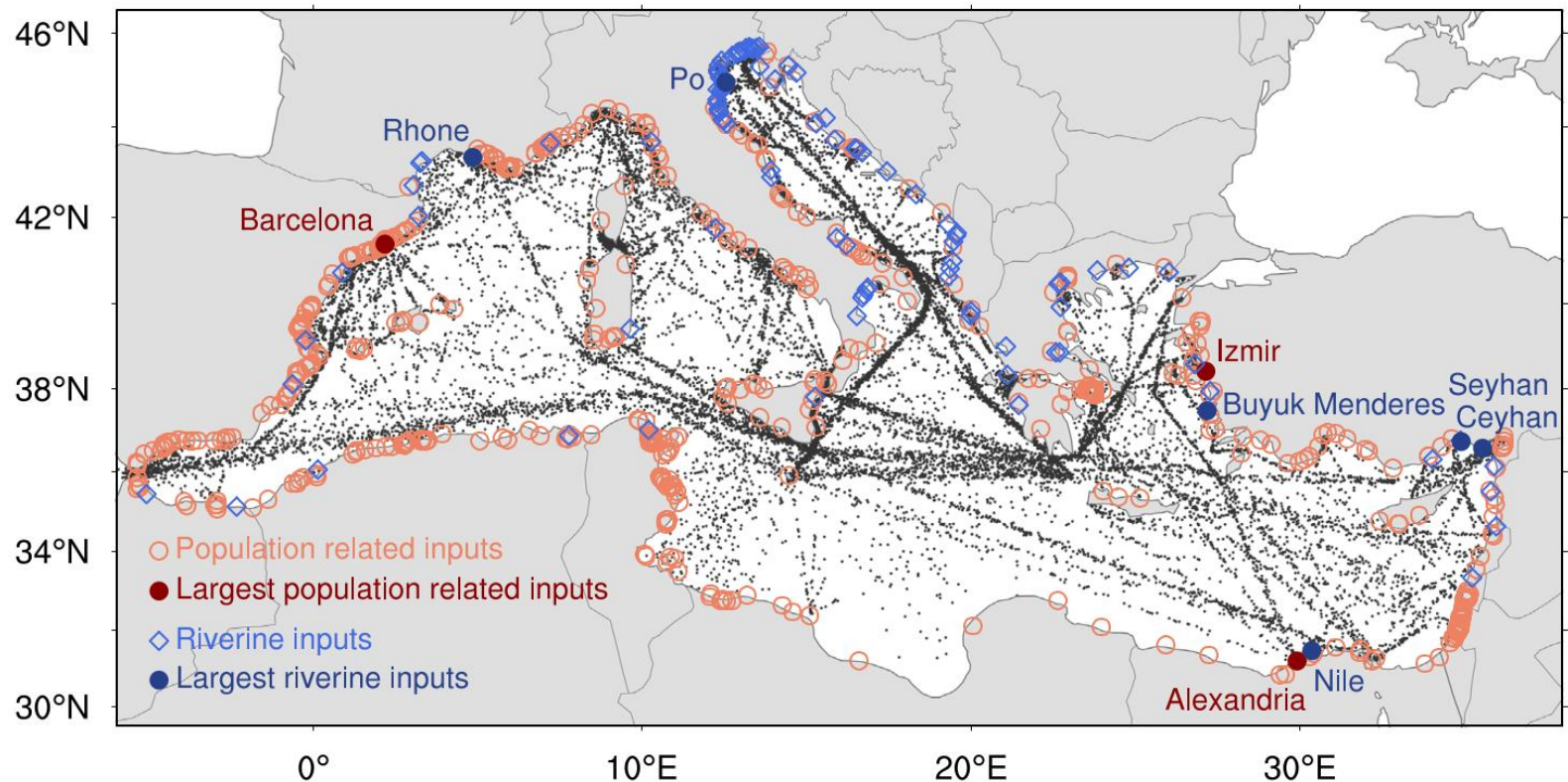
Christina Zeri
Chemist- Oceanographer

Research Director
Institute of Oceanography-HCMR
chris@hcmr.gr



Why is Mediterranean a hot spot of marine litter and microplastics pollution?

- High coastal population (~150 million)
- 1/3 of the world's tourism
- 15 % of the global shipping activity
- Enclosed character of the basin
- Specific Surface water circulation





Beach Litter thresholds according to the EU MSFD and the UNEP/MAP IMAP



JRC TECHNICAL REPORTS

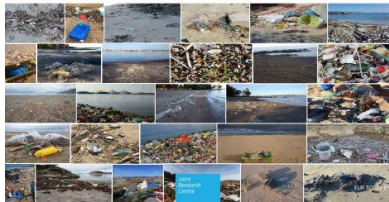
EU Marine Beach Litter Baselines

Analysis of a pan-European 2012-2016 beach litter dataset

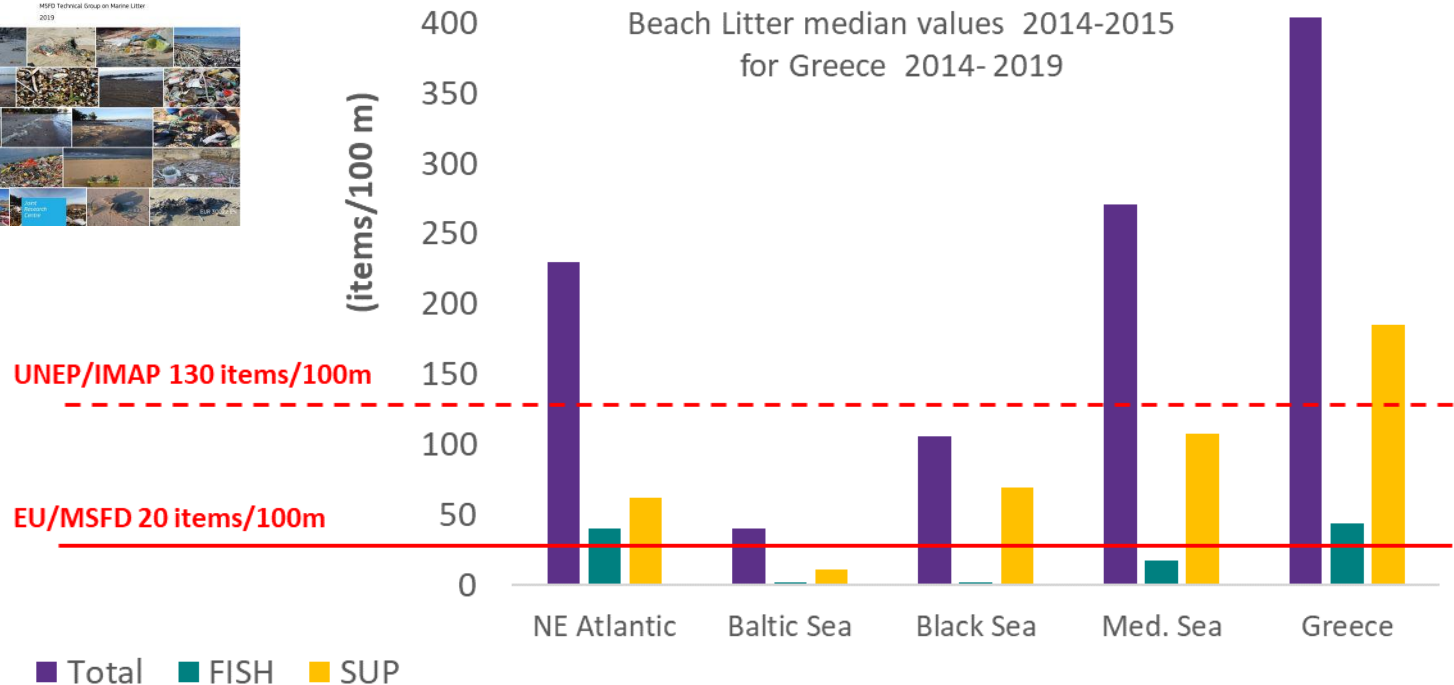
Harris, G., Walcott, D., Van Loon, W., Adams, A.M., Brooch, A., del Mar Ochoa-Martinez, M., Ntoma-Jacob, H.E., Vitor, R., Gargallo, A.

JRC Technical Group on Marine Litter

2019

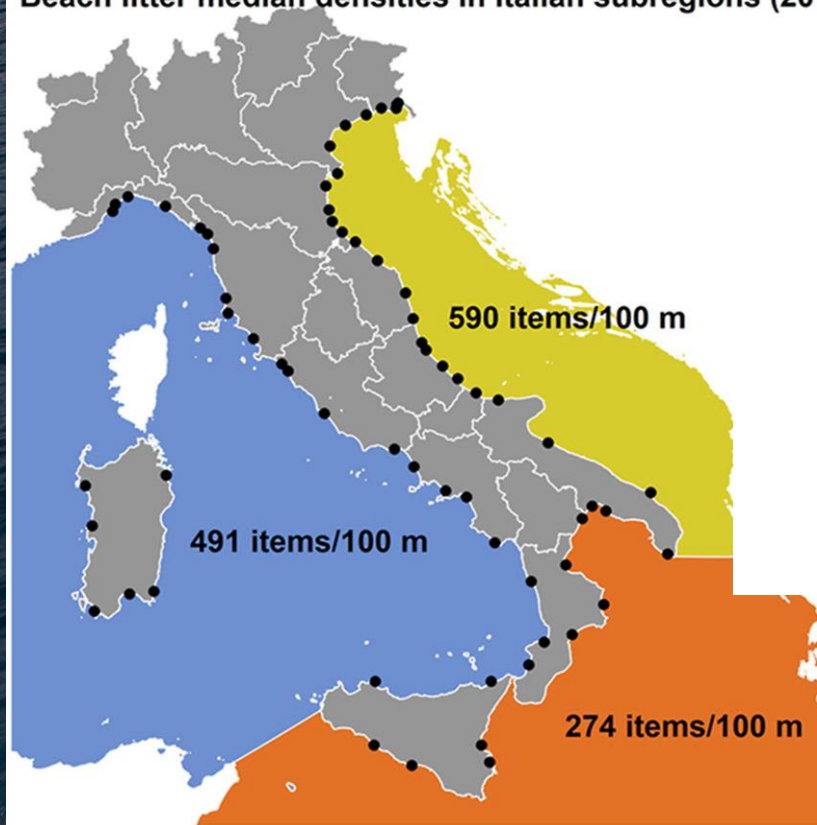


The first marine litter threshold adopted on EU level



Data from EU Member States

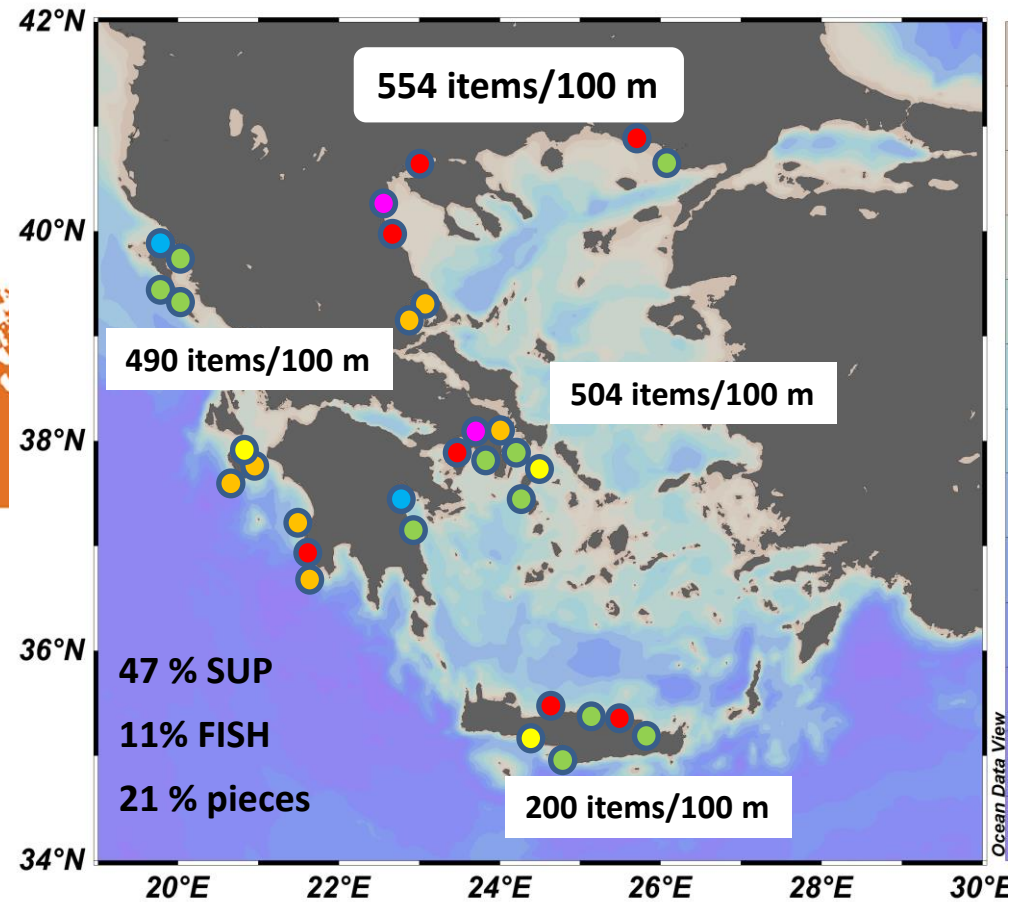
Beach litter median densities in Italian subregions (2015-2018)



Fortibuoni et al., 2020, Environmental Pollution

Marine litter on the Mediterranean coastline

~ 270 items /100 m



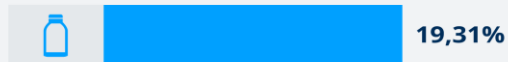
Zeri et al., 2022, Springer-Verlag in press

Marine waste on European beaches

Single-use plastic items



Cigarette butts



Other bottles incl. caps and lids



Food containers incl. fast food packaging



Cotton bud sticks



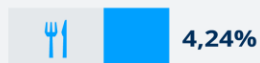
Drinks bottles incl. caps and lids



Wet wipes



Plastic bags



Cutlery



Cups and cup lids



Straws and stirrers

Single-use plastic items account for 50 percent of marine litter

Source: European Commission | Data for 2016

© DW



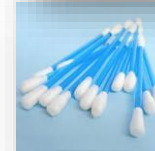
36 %



18 %



16 %



9%

The Greek fingerprint



5 %



4 %

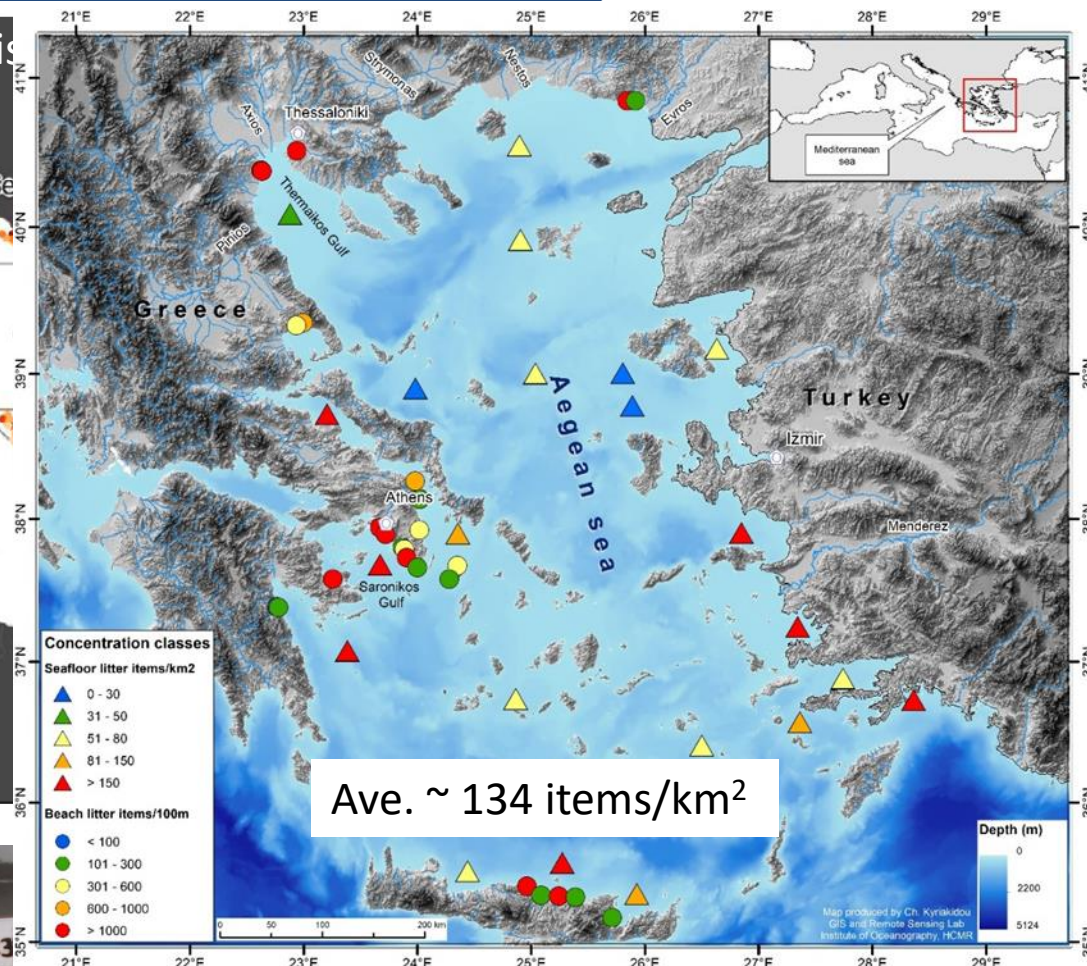
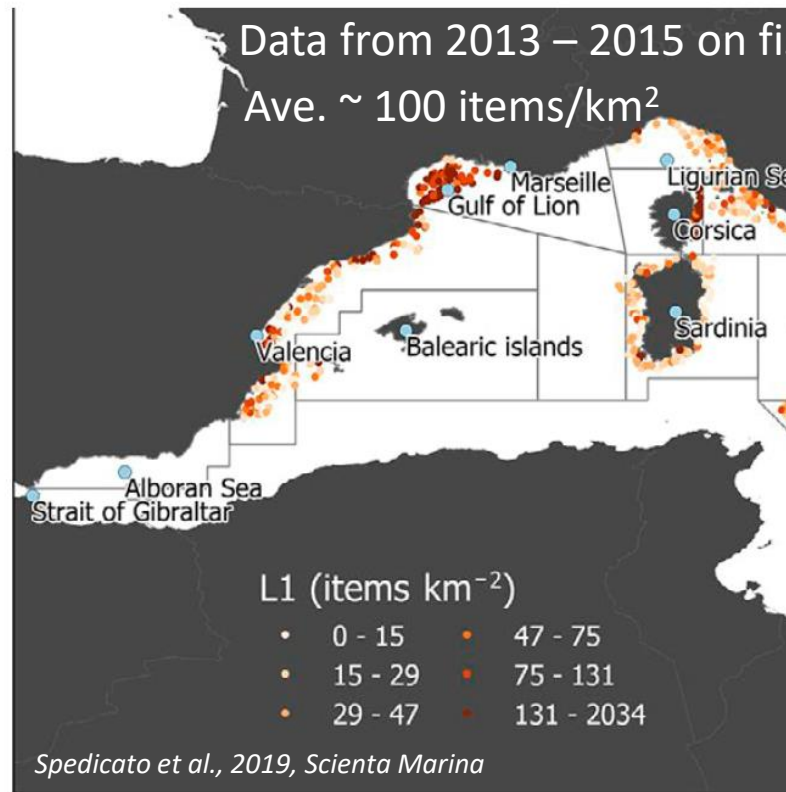


3 %



3 %

Marine Litter on the Mediterranean Seafloor



Mediterranean canyons

51,905 \pm 20,606 items/km²

Global ocean canyons

22,488 \pm 6,897 items /km²

Hernandez et al., Frontiers in Marine Science 2022

1000 m depth in the Ionian Sea

© HCMR



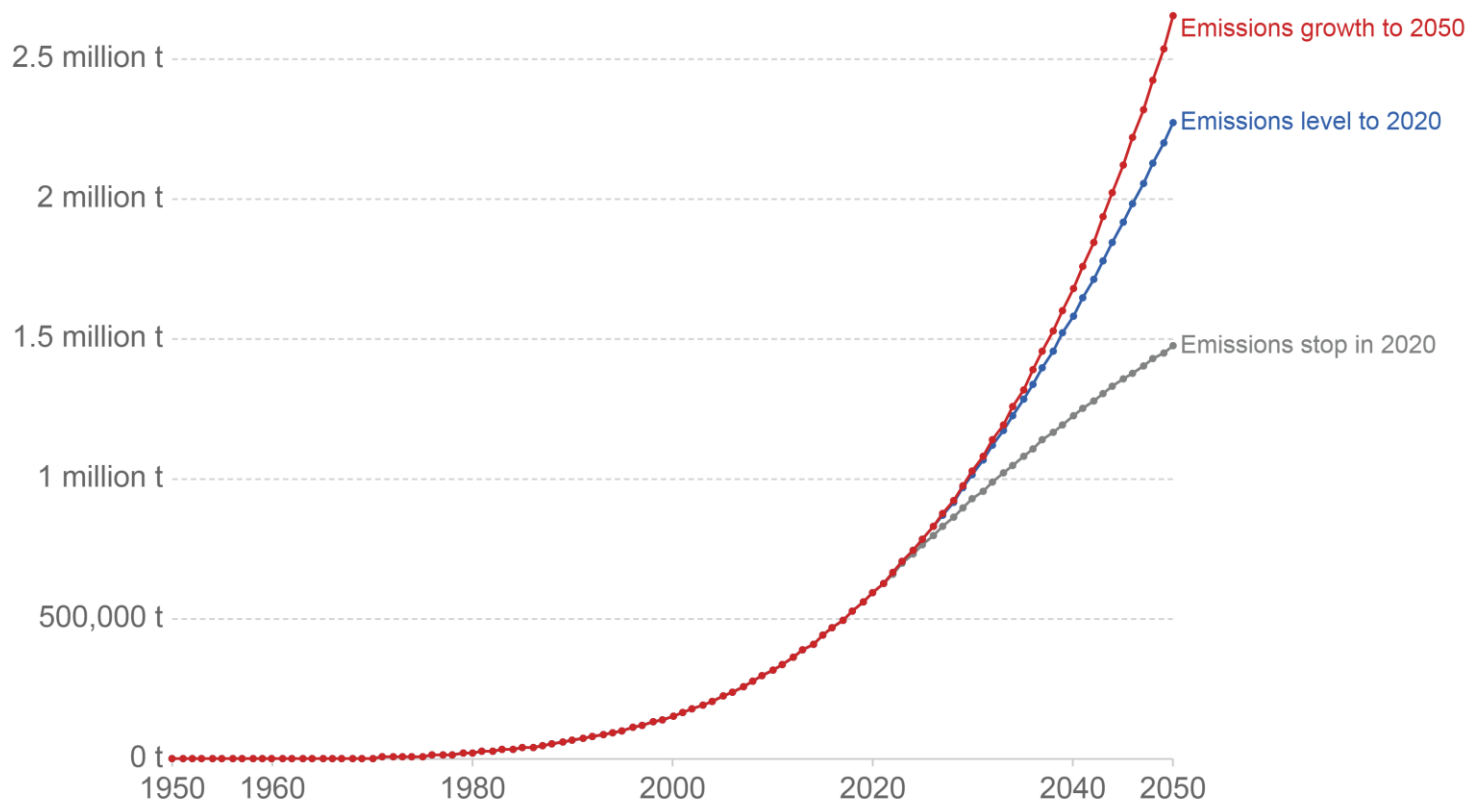
© HCMR

Microplastics are produced from fragmentation of larger items on land but also during the use of materials and eventually enter the marine environment

Microplastics in the surface ocean, 1950 to 2050

Our World
in Data

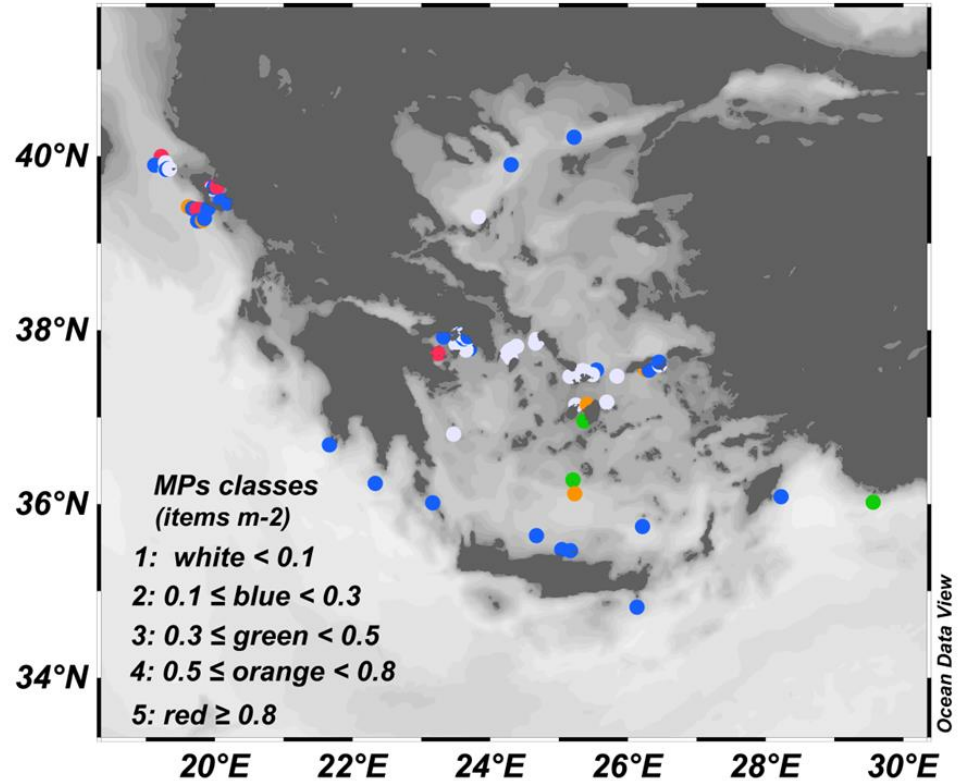
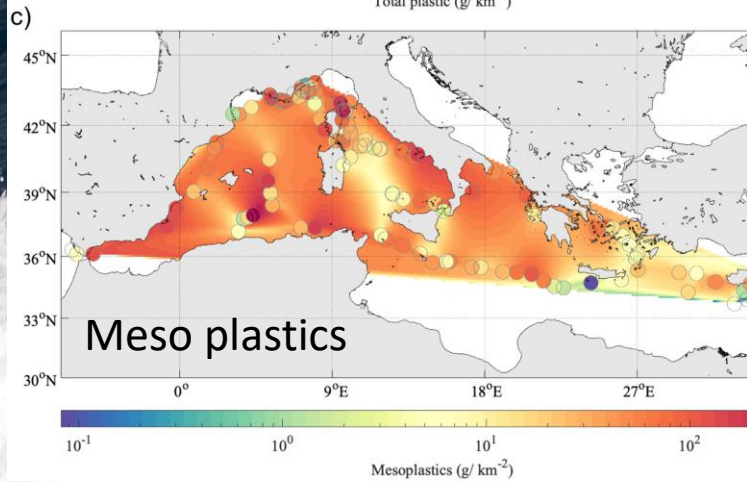
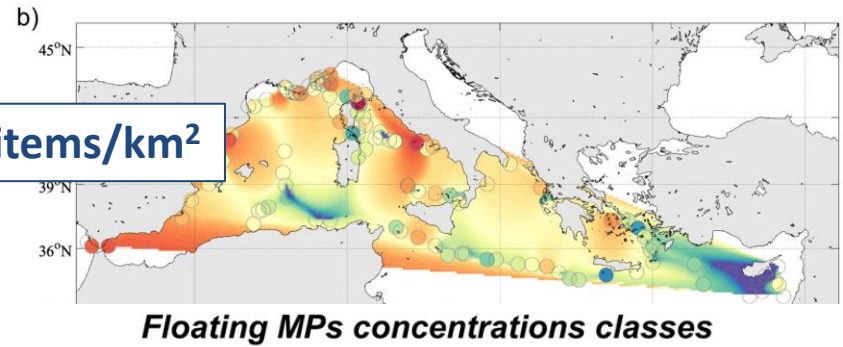
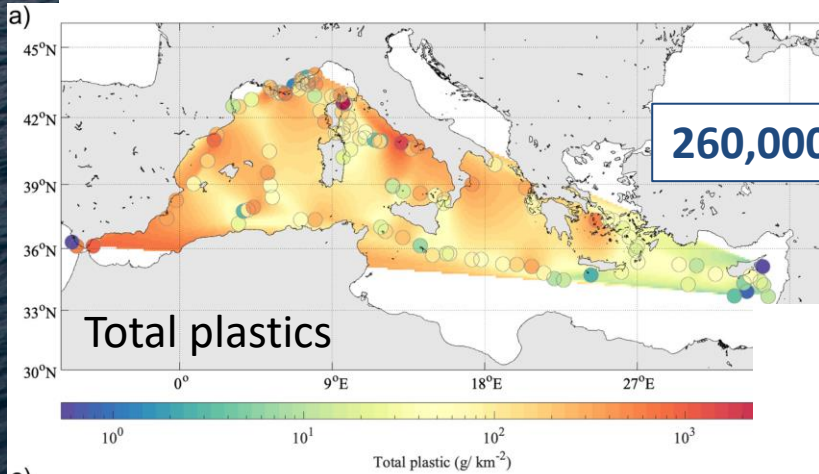
Microplastics are buoyant plastic materials smaller than 0.5 centimeters in diameter. Future global accumulation in the surface ocean is shown under three plastic emissions scenarios: (1) emissions to the oceans stop in 2020; (2) they stagnate at 2020 emission rates; or (3) continue to grow until 2050 in line with historical plastic production rates.



Source: Lebreton et al. (2019). A global mass budget for positively buoyant macroplastic debris in the ocean.

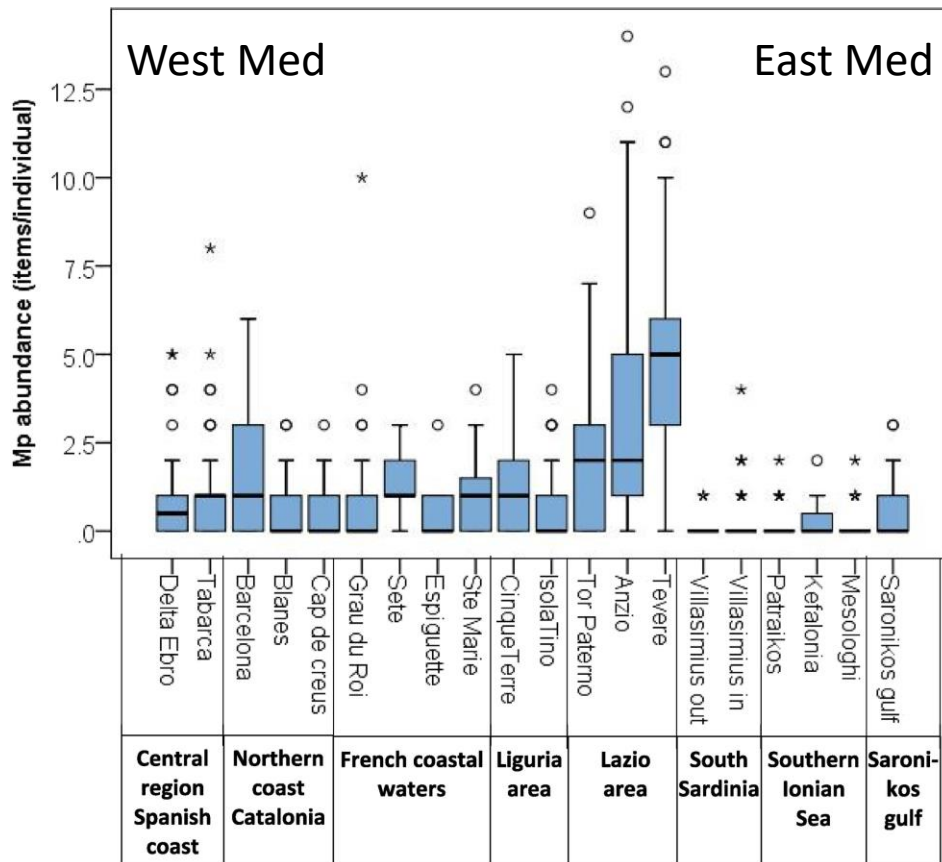
CC BY

Sea surface plastics



Pedrotti et al., 2022, Science of the total Environment

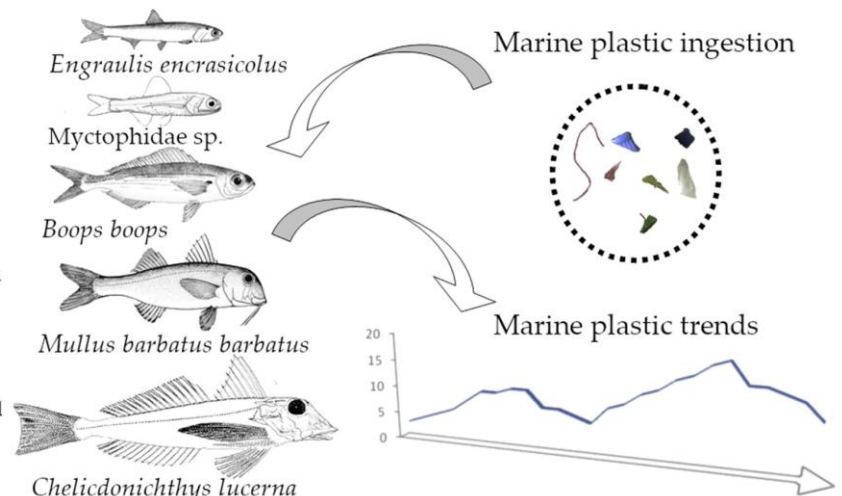
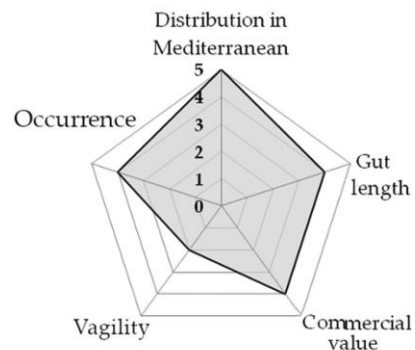
Adamopoulou A, et al., (2021) Frontiers in Marine Sciences




Ingested microplastics in fish show similar trends to seawater abundances in the Mediterranean basin

Bray et al., 2019, Env.Pollut.

Bioindicator Index



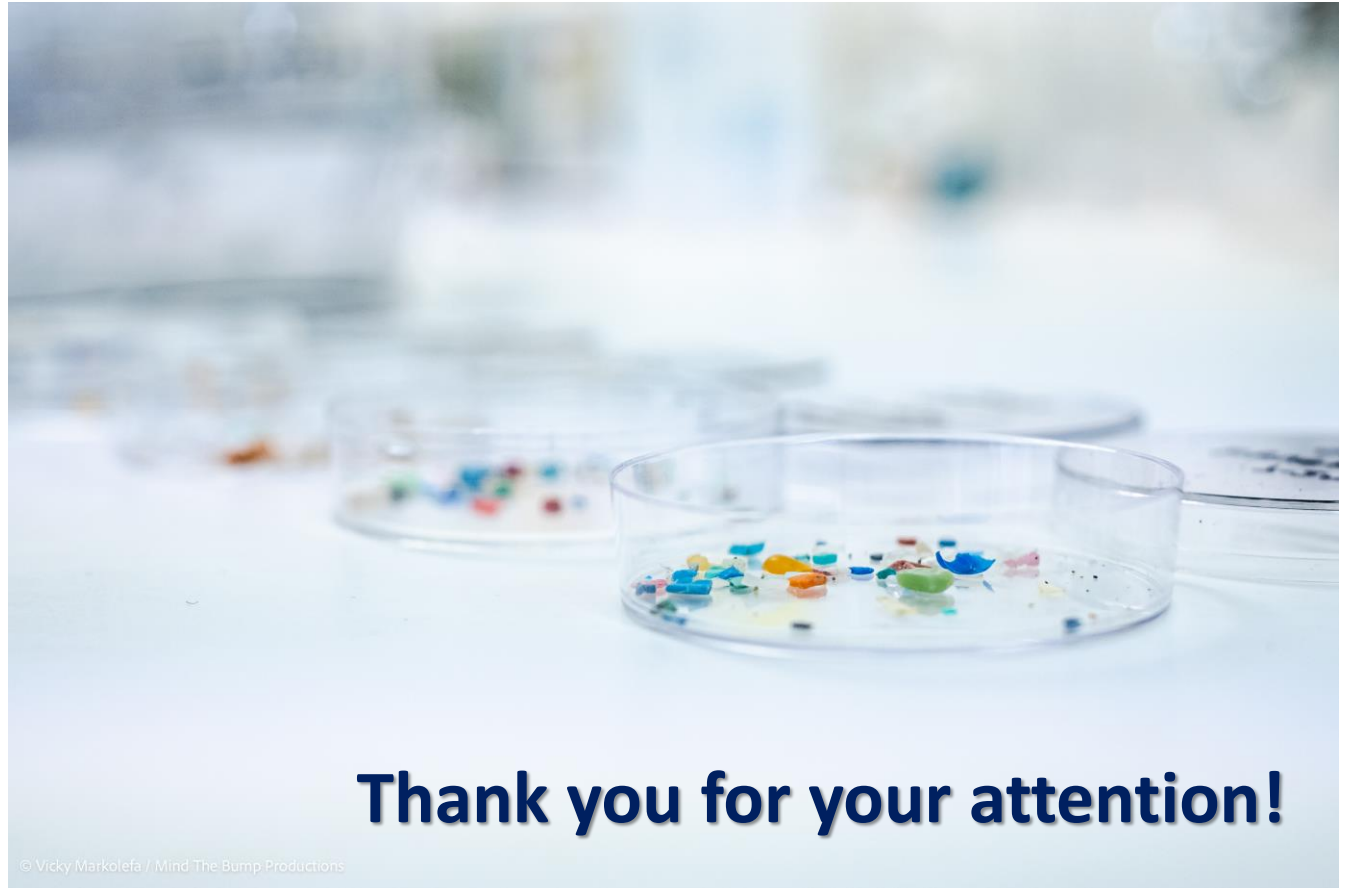


The impacts of marine litter and microplastics on the ecosystems are still not fully revealed.

- Potential toxicity on the organism level
- Disturbance of the natural biogeochemical cycles
- Key role on the exposure to chemicals

The Mediterranean Sea represents only 1 % of the world's oceans, but it holds ~ 11 % of marine species.

Marine Litter and Plastics pollution is a multi-faceted problem that needs multi- actor engagement to reach to solutions



Thank you for your attention!

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