Sampling strategies for plastic pollution

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Plastic pollution has been reported in all areas of the environment, yet our limited knowledge of plastic sources and pathways makes it difficult to assess the risks. To better understand the current distribution of plastic debris, it is important to use standardized methods for sampling and analysis to obtain representative data.

The Biology Department at the University of Cadiz, and specifically the Marine Litter Laboratory, develops several projects dedicated to the study of plastic pollution in multiple aquatic systems. Depending on the environmental compartment and the size spectrum, different sampling and analytical techniques are used.

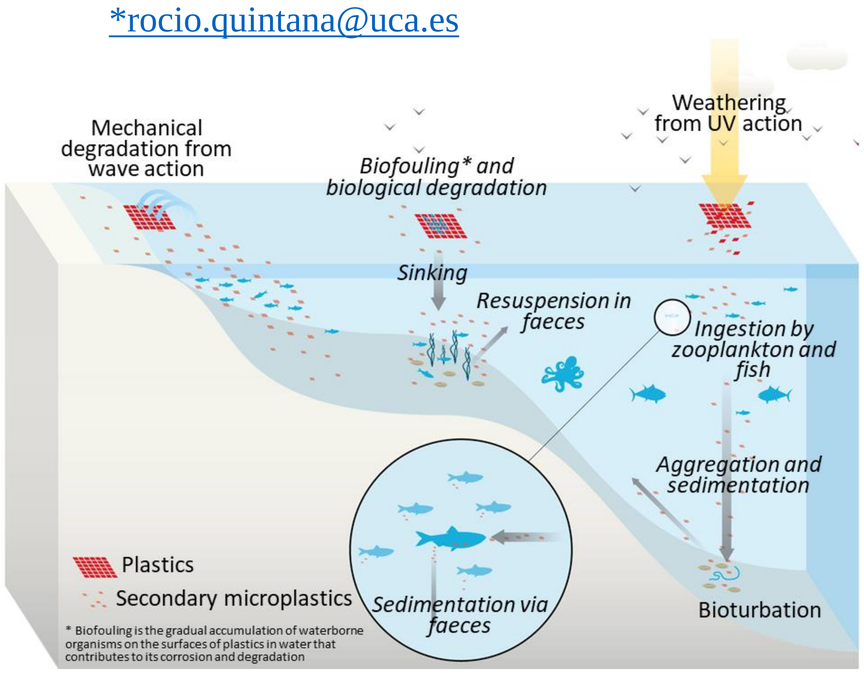


Figure 1. Natural processes affecting the distribution and fate of plastics (Pravettoni, 2018)

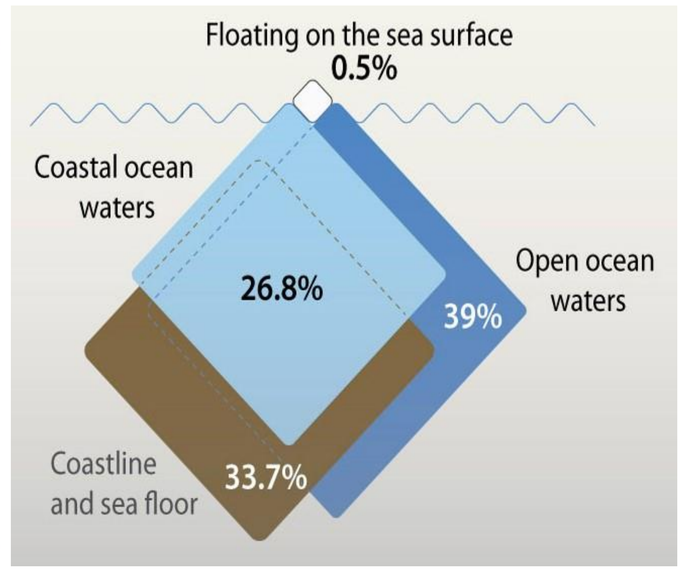
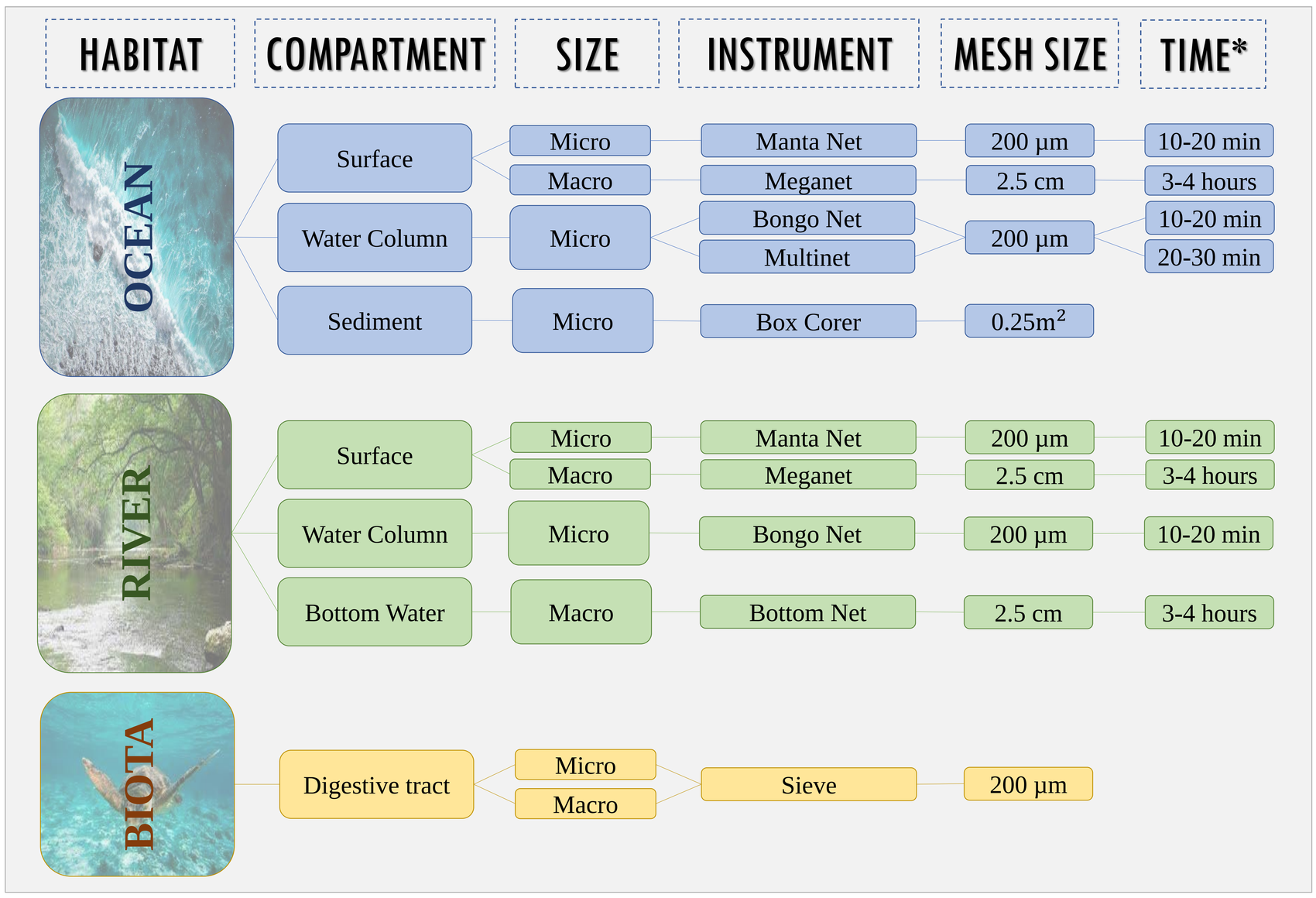


Figure 2. Floating plastic, just the tip of the iceberg (Pravettoni, 2018).

Standardized Methods for Sampling



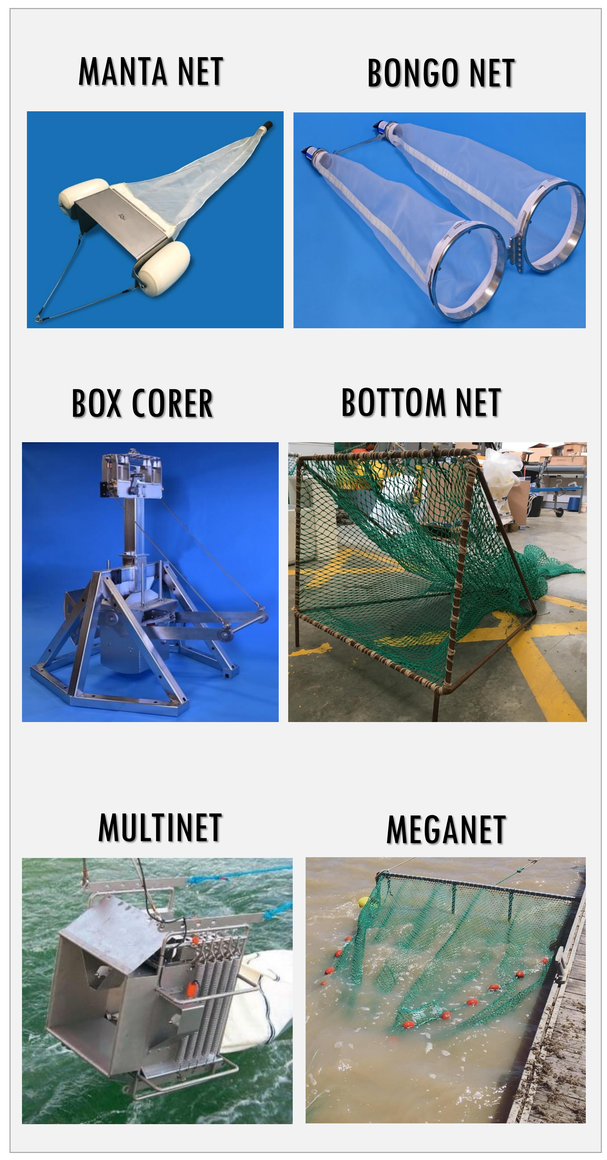


Figure 3. Diagram of the different sampling methods according to the environmental compartment and plastic size (macroplastic > 2.5 cm and microplastic < 5 mm). *The sampling time is estimated, it is obtained by maximizing the filtered volume without clogging the net.

Figure 4. Macroplastic from the Meganet (mesh size 2.5 cm).

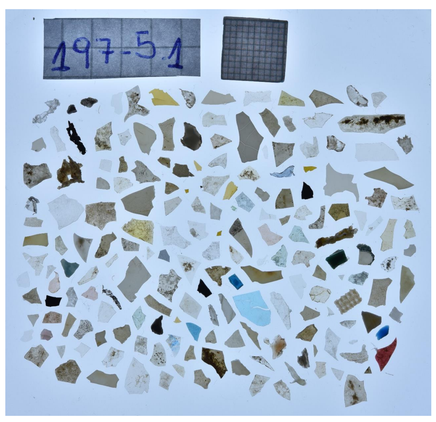


Figure 5. Microplastic from the Manta Net (mesh size 200 µm).

Figure 6. Macroplastic of the digestive tract of a turtle.

To describe a system, it is necessary to monitor all environmental compartments, the combination of different sampling methods are complementary in order to cover all size spectrum of plastic debris, from micro- to macro-.

These techniques provide a unique opportunity to get a global picture of plastic distribution in aquatic ecosystems. Therefore, standardized methods allow comparison and application beyond the scope of individual projects, providing a useful transfer of information from research to policy making.

REFERENCES

- Pravettoni, Ricardo (2018). How much plastic is estimated to be in the oceans and where it may be. (https://www.grida.no/resources/6907)
- Pravettoni, Ricardo (2018). Natural processes affecting the distribution and fate of plastics.. (https://www.grida.no/resources/6911)

ACKNOLEDGEMENTS

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