

A Belgian harmonized data infrastructure for beach litter and microlitter supporting citizen science and national monitoring

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The increasing presence of marine litter, particularly plastics and microlitter, in our oceans and along coastlines has raised serious environmental and health concerns, posing significant risks to ecosystems, biodiversity, and human well-being. Addressing these challenges necessitates robust, harmonized data collection to inform environmental assessments and guide effective management actions. Standardized monitoring and data infrastructure, as outlined under the Marine Strategy Framework Directive (MSFD) and the OSPAR Convention, are essential for evaluating the impacts of marine litter and ensuring consistent reporting to support mitigation efforts.

In Belgium, monitoring marine litter involves both citizen science initiatives and official programs. The Proper Strand Lopers (PSL), a citizen science organization, engages communities in litter surveys, generating valuable data on beach litter distribution and trends. These efforts are critical for raising public awareness and supporting national and regional strategies to combat marine litter. Complementing this, national monitoring programs focus on microlitter in sediment, water, and biota, following international guidelines. While beach litter and microlitter are monitored through distinct approaches, both datasets are vital for understanding the broader extent of marine litter pollution and informing mitigation measures at both national and regional levels.

The Belgian Marine Data Center (BMDC) is developing a harmonized and standardized data infrastructure to manage and share these datasets of beach litters and microlitters, aligning with the FAIR (Findable, Accessible, Interoperable and Reusable) principles. This infrastructure will include a web application featuring advanced visualization tools that enable users to explore trends in beach litter distribution and download relevant data. By offering such tools, stakeholders can better track the impacts of mitigation measures, prioritize areas for intervention, and develop strategies to combat marine litter pollution. Additionally, the BMDC is implementing web services, including APIs, to facilitate seamless data integration, interoperability and accessibility.

This infrastructure will support national stakeholders in conducting environmental assessments and taking targeted actions. Furthermore, harmonized data flows are being established to report collected datasets to international repositories such as EMODnet Chemistry and ICES, following updated guidance for marine litter monitoring under the MSFD (Galgani *et al.*, 2023) and microlitter monitoring guidelines from the OSPAR Convention (OSPAR Commission, 2024). By aligning the data with European standards and reporting procedures, the BMDC will ensure that Belgian data can be centralized and integrated into broader regional and global assessments of marine litter and microlitter. This will enable coordinated action at a larger scale to reduce the impact of marine litter on the environment.

References:

Galgani, F., *et al.* (2023). *Guidance on Monitoring of Marine Litter in European Seas – Update of the guidance on monitoring of marine litter for the Marine Strategy Framework Directive.*
OSPAR Commission (2024). *CEMP guidelines for the monitoring of microlitter (including microplastics) in seafloor sediments for OSPAR maritime area, OSPAR Agreement 2024-06.*

Keywords

Beach Litter, Microlitter, Harmonized Data Infrastructure, FAIR Principles, MSFD, OSPAR Convention, Data Visualization Web Application