



Floating litter on the coastal waters of the south-eastern of the Bay of Biscay: abundance, composition, sources and spatial distribution

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Marine litter is a global concern affecting all the oceans of the world. It threatens not only marine environment and human wellbeing, but also it hampers economic activities such as coastal tourism, fisheries and shipping. Floating items represent the mobile fraction of marine litter that is located at the surface of the water column. Recent studies point the south-eastern of the Bay of Biscay as an accumulation zone of floating litter. In this region, local authorities have shown interest in addressing this challenge. For that, they are coordinating and participating in Life LEMA project that aims to define an optimized solution to manage floating litter. A good understanding of the behavior of floating litter is crucial to enable effective management measures for facing this issue, particularly important in the south-eastern of the Bay of Biscay. Yet, precise knowledge about quantities, composition, sources and distribution of floating litter is still limited in this area. Here we show the results of the work undertaken in Life LEMA project, where floating litter was collected by retrofitted fishing vessels on coastal waters using an adapted superficial trawl. Litter was quantified and characterized to define its abundance, composition, mainly sources and mapping its spatial distribution. Nearly 4,000 items were counted, weighted and classified according to a standardized Master List of litter items created within in the framework of the project. Results highlighted the prevailing presence of floating plastic litter regarding number and weight. Plastic pieces between 2.5 cm and 50 cm sized were most frequent in number but fishing nets topped the analysis in terms of weight. Sea-based sources and in particular, the fisheries sector, represented almost 60 % by weight of floating litter but only 16 % by number. The analysis also indicated a patchy distribution of floating litter that depends on temporal variability, reducing its presence from beginning up to the end of the summer season. These outcomes provided insights into the transboundary problem of floating litter in south-eastern of the Bay of Biscay and they are aligned to Marine Strategy Framework Directive monitoring requirements. Moreover, they can help decision makers to settle efficient strategies at local but also at regional level for preventing further pollution.



Monitoring riverine litter by advanced technology

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Rivers are according to literature key vectors of marine litter input into the oceans. And the on-growing concern towards plastic pollution is making authorities to seek for new technology and approaches. We developed a riverine floating litter detection and monitoring system to quantify the litter passing through a river mouth. The system, that is comprised of a hardware (camera system) and a software (detection algorithm), has been implemented in 3 sites, 2 in the SE Bay of Biscay (Orio in Spain; Bayonne in France) and 2 in the NE Mediterranean Sea (Marseille, France). We investigated the effectiveness of different configurations and camera settings for litter detection at rivers. Particularly we focused on the validation of the algorithms to detect litter under different environmental conditions. The system provides a near-real time quantitative indicator of the floating riverine litter released in the coastal area by a specific river. The information provided by the system is currently being embedded in the LEMA tool, platform devoted to gather and display information on: (1) the floating marine litter collection activities undertaken in the SE Bay of Biscay, (2) the prediction of floating marine litter hotspots to guide the vessels devoted for the collection activities where to go to do such activity, and (3) the historical data regarding these activities and data. Our results provide useful information regarding the amount and size of litter coming from the rivers, the role of the rivers in the onshore plastic inputs into the ocean, and the onshore and offshore black hotspots that need attention in order to prevent the plastic pollution in water bodies.