



A Lagrangian approach to study the coastal surface transport of marine litter in the south-eastern Bay of Biscay using modelling and observations

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Marine litter is today a major contribution to ocean pollution with multiple impacts on environment, economic and societal activities. As a consequence, the management of marine litter is a major challenge for coastal areas. However, the dispersion of marine litter in the coastal ocean remains poorly understood. In this context, transport in the surface ocean layer is investigated in the coastal area of the south-eastern Bay of Biscay. This work is part of the LIFE LEMA project, aiming at evaluating the feasibility of using real time ocean observations and operational forecasts to support marine litter collection both at sea and onshore.

Two kinds of ocean surface current information are used to advect Lagrangian tracers: (i) measurements from High Frequency Radar, (ii) results from the IBI Copernicus model configuration. Based on this surface current data, a Lagrangian transport model was set up and validated against measurements. Then a multi-year numerical simulation of Lagrangian transport was performed and analysed to characterize surface ocean transport patterns in the area. Post-processing of the results allows to search for accumulation areas at sea, or possible marine litter “hotspots”, as well as privileged areas of onshore beaching.

Finally, the use of these results in an operational context is considered, in order to help collection operations depending on surface ocean dynamics along French and Spanish coasts of the south-eastern Bay of Biscay.