

# Tracking floating marine litter in the coastal area by combining operational ocean modelling and remote observation systems.

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The service “Floating Marine Litter Tracking”, or “FML-TRACK” is a downstream service from Copernicus Marine Service, aiming at providing an operational support to reduce Floating Marine Litter (FML) in the coastal area. More precisely, FML-TRACK aims at supporting FML reduction strategies both downstream (interception at sea with collect vessels and on beaches with cleaning facilities) and upstream (source identification and reduction), by tracking the dispersion of FML in estuaries and in the coastal ocean. Using a combination of innovative detection technologies and operational metocean modelling, the service produces tailored decision-aid indicators to monitor and guide FML collect operations, including day-to-day operation support in near real time. Guidance offered by these indicators help maximizing the amount of FML removed from the natural environment, while at the same time contributing to reduce the cost and impacts of operations (i.e. cost per kilogram of collected FML, fuel consumption, carbon footprint). Moreover, tracking technologies contribute to the reduction of FML emission at the source, by helping identifying most probable emission sectors depending on metocean conditions.

To achieve these purposes, FML-TRACK combines innovative detection solutions based on video monitoring in rivers and satellite imagery in the coastal area, together with metocean-based FML transport modelling. In the operational mode of the service, it provides a decision-aid dashboard supporting day-to-day FML collect operations. The dashboard offers indicators aiming at guiding FML collect operations, to monitor and optimize their efficiency. It especially provides a tracking of FML in the coastal area and a prediction of concentration hotspots to guide collect vessel at sea; and anticipate massive onshore arrivals to help beach cleaning at land.

The service was demonstrated in the coastal area of the South-Eastern Bay of Biscay, part of the Iberian-Biscay-Ireland regional seas. It took benefit of pre-existing components developed during the former LIFE LEMA program, which were further improved and complemented to bring the tool and service to a new stage, compatible with a realistic application in an operational context.

Main end-users of the service are coastal public administrations involved in the reduction of FML in their region. End-users can also be private companies operating sea or beach cleaning. Fishermen who can be involved in FML collect effort (actively or passively) may also use the service as a support to operations and/or to participate in the monitoring program. Finally, the service may also be of interest for NGOs and scientists committed to the study of and fight against FML, through either participation to the monitoring and/or use of the database for science, awareness and education.