



Marine Litter in the Algarve Coast: Main sources and Distribution using a modelling approach. Author: Eloah Rosas, João Janeiro, Flávio Martins.

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Anthropogenic debris, particularly plastics, represent a highly persistent threat to global marine ecosystems. In name of the convenience, population are choking the planet with plastic that does not simple “goes away”. Since 1950, the production of plastic has grown exponentially, from 1.5 to 335 Mt of plastic in 2016 (PlasticsEurope, 2017), and around 1.7 to 4.6 % of the total global plastic waste produced ended up in the ocean ...(.)(.)(.)(Jambeck et al., 2015). After entering the ocean, buoyant items will remain in the sea surface, being transported by wind and sea surface currents, until they sink to the seafloor, get deposited on the shore or degrade over time)(.)(.)(.)(Andrady A., 2015). Litter in marine and coastal areas has environmental, human health, aesthetic and economic negative impact.

With an regional economy closely linked to the sea, depending mainly from tourism and fisheries, and important natural parks with high biodiversity, the Algarve region, located in the south Iberian Coast, is vulnerable to marine litter. It is thus, paramount to understand their distribution and amounts to help develop and implement effective strategies to address the regional problem of marine litter. The Portuguese National Directory of Marine Resources has compiled marine litter data following the standardized method, OSPAR for monitoring marine litter, along the Portuguese coast. In Algarve coastal surveys are performed on Faro Island and Batata beach. The vulnerability of each coast section to litter is a function of its morphology, hydrodynamic and meteorological conditions, among other parameters.

Using a numerical modelling approach, this research aims to characterize the main pathways of marine litter in the region. Local meteocean conditions, hindcasted by the Algarve Operational Modelling and Monitoring System (SOMA) were used to evaluate the Lagrangian transport of macroplastics from different sources (land and marine based), thus assessing potential regional hotspots for these pollutants. Part of the MOHID Modelling System, the Lagrangian model used as the advantage of allowing both hydrodynamic and Lagrangian run simultaneously, increasing the accuracy of the trajectories)(.)(.)(.)(Janeiro et al., 2012). Assuming different sources (land and maritime-based), passive tracer particles were released forward in time for 15 days (45 days total) with and without the assumption of extra wind forces influencing particle movement.

Results show that paper and plastic are the main constituent of litter and the majority of traceable items originate from land, specifically tourism activities and higher concentration were found in Faro Island. It was observed a significant seasonal effect on the abundance of litter from land and marine sources on Faro Island. Mathematical models results show be sensitive to particular episodes of local meteocean conditions. In addition, both particle drift velocities and distribution of drift paths are highly sensitive to wind drift forcing.