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Plastic waste dominates seafloor litter in Mediterranean and Black Sea surveys

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Researchers have trawled coastal areas of the Eastern Mediterranean and Black Sea for waste and found up to 1211 items of litter per km^2. Plastic bags and bottles were some of the most commonly found items. They present the results in a recent study, which they say supports Marine Strategy Framework Directive (MSFD) implementation, as well as efforts to discourage plastic carrier bag use.

Marine litter has a range of damaging impacts. For instance, marine creatures can become entangled in floating nets or eat the litter. Floating litter can also transport non-native species into new environments and tiny plastic fragments, 'microplastics', have been shown to be long-term sources of pollutants, such as phthalates.

This study, conducted under the EU PERSEUS project[1], assessed marine litter on the seafloor of five areas in the Eastern Mediterranean and the Black Sea — three gulfs in Greece, one gulf in Cyprus and one bay in Romania.

The researchers say this study highlights the need for action to tackle marine litter and is relevant to 'descriptor 10' of the MSFD. This is one of eleven qualitative criteria describing 'good environmental status' listed by the Directive and states that '*Properties and quantities of marine litter do not cause harm to the coastal and marine environment*'. An important first step in satisfying this descriptor is to quantify marine litter. There is only limited information on quantities in the Mediterranean and Black Sea, however.

The study trawled the seabeds of the five areas for litter at a total of 94 sampling stations in early 2013. The researchers point out that rocky areas cannot be trawled, and that they focused on fishing grounds with sandy or muddy floors.

In total, 5398 items of marine litter were collected. The majority (3269) came from the Saronikos Gulf near Athens, where 1211 items were gathered per km^2 of area trawled. The Limassol Gulf in Cyprus was the cleanest area, with 46 items collected and a litter density of 24 items/km^2.

In all areas except the Constanta Bay in Romania, the majority of items were made of plastic. Nearly all (95%) items from the Saronikos Gulf were plastic, which exceeds the global average of 75%. Between 60-67% of finds in the Limassol Gulf, the Gulf of Patras and the Echinades Gulf were plastic. The figure was 45% in the Constanta Bay.

Half of all plastic items (49.6%) were bags. This result provides further support for the EU decision to reduce the use of plastic bags, the study says. Bottles accounted for 17.5% of plastic waste and sheets 13.5%. Fishing debris, such as lines and nets, contributed 6.7% of all plastic litter. After plastic, metals were the most common material, at 8.7%–22%, depending on the area, of items found. Glass and ceramics accounted for 6–22% of litter.

In all areas, over half (50.8–71.8%) of litter was between 5 x 5 cm and 20 x 20 cm in size. Small items, under 5 x 5 cm, also made up a significant percentage of litter, with ranges between 7% and 23%. Small fragments are a particular concern because they are difficult to remove from the sea, and are more likely to be ingested by animals or to transfer pollutants.

1. PERSEUS (Policy-oriented marine Environmental Research for the Southern European Seas) is supported by the European Commission under the Seventh Framework Programme. See: www.perseus-net.eu