

Science for Environment Policy

Shipping oil pollution: new hazard mapping method developed

A new method for mapping the spread of oil released by ships is presented in a recent study, where it is applied to the Adriatic and Ionian Seas of the Mediterranean. The method pulls together a range of data, including information on shipping routes, oil particle behaviour, currents and climate. In this case study, it reveals pollution hotspots in the south-western Adriatic Sea and north-eastern Ionian Sea.

Accidental oil spills at sea are becoming rarer. However, ships still deliberately release some oil into the sea as part of normal operations. For example, they release oily water from the bilge (the lowest compartment in a ship), oily ballast water and fuel oil sludge. Hazard maps which show the spread of this oil in the sea can be used to help manage the health of the [marine environment](#).

The mapping method developed by the authors of this study focuses on operational discharges in the southern Adriatic and northern Ionian Seas. The researchers say that their method could be used anywhere, however. They used it to produce maps of oil pollution on the surface of the sea and along the coastline for 2009–2012, as well as for each season and month during this period.

To create these maps, they first collected shipping data from the Italian coastguard. This gave them the number of ships in each geographic area per month.

They combined this traffic data with estimates of oil discharges and simulated the spread of oil in the region using a freely available model, [MEDSLIK-II](#). This model predicts the movement of oil particles based on sea currents, wind, waves and sea-surface temperature. The researchers gathered information on these factors from the [European Centre for Medium-Range Weather Forecasts](#) and the [Mediterranean Forecasting System](#).

The maps show how hotspots of oil occur in areas that have both high traffic levels and weak currents, such as the semi-closed area between Corfu and the Greek coastline, in the eastern Ionian. In contrast, the Bari Port area (Italy) does not show high oil concentrations, despite high levels of traffic, because strong currents carry the oil away.

During the 2009–2012 period, areas that were shown to be continuously and severely polluted were offshore in the south-western Adriatic and the path of the Western Adriatic Coastal Current. Moderate but persistent levels of oil can be seen for the entire coastline of the study region.

The maps indicate that surface concentrations in the open sea varied throughout the period, however. The lowest surface concentrations were during the winter, and the highest in the summer. This is because stronger winds in winter generate waves that disperse the oil in the water column.

They also reveal that some important marine protected areas (MPAs) could be affected by operational oil pollution. These include Torre Guaceto (Italy) and the Kalama Delta Natural Reserve (Greece).

The researchers believe these maps can be used to help predict future levels of oil contamination, assuming that traffic and oil discharge levels do not change significantly. They compare well with aerial and satellite images of the area produced by other studies.



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