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Use of observations and models to support oil spills emergency management in the North-Western Mediterranean: models intercomparison and reduction of forecast uncertainty.

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Monitoring and forecasting services to limit the potential impact of pollution events at sea, such as major oil pollution accidents, benefit greatly from the availability of regional scale observations and numerical products, such as HF radars, high-resolution satellite observations, and downscaling of basin scale models.
The availability of these data was recently tested during the important oil spill in October 2018 in the Ligurian Sea, north of Cap Corse and Capraia.
The accident occurred in a situation of good coverage of the observation data.
In this area there are indeed HF radars that are part of a large network dedicated to monitoring the coastal zone of the North-Western Mediterranean. Although these radars provided only data near the point of the accident, and not in the areas affected by the subsequent oil slick propagation, these observations were useful during the emergency phases to assess the forecast reliability and provide better support to the competent authorities for emergency management.
During the initial stages of the accident, the availability of satellite data, in particular from Sentinel 1, allowed not only to map the area affected by the pollution, but also to validate the models of evolution of the spill. Other data available through observations by aircraft, have allowed to follow the evolution of the hydrocarbon spots that eventually reached part of the coasts of southern France. All such information have also been used for the model re-initialization of the slick position during the emergency response.
The quality of the model forecasts generated as a Copernicus downstream service was useful not only to delimit the marine areas affected by this oil spill, but also to identify even from the initial forecasts, although with some temporal uncertainty, the potentially invested coasts.
The availability of this data is essential to improve the performance of the computational models in use, in terms of resolution, meteorological forcing, and parameterization of physical processes.
In particular, methods are being testing to reduce the model uncertainty on a regional scale, through the assimilation of HF radar data, whose benefit extends in this case well beyond the radar coverage area.
In this context it is also extremely useful to compare the results of the simulations carried out by different institutions, through the cross-comparison of the results of the models, in order to refine the response capabilities, to better identify the sources of uncertainty on this type of simulations, and finally to develop common and shared procedures for emergency management.