Geophysical Research Abstracts
Vol. 21, EGU2019-3289, 2019
EGU General Assembly 2019

Corsica oil spill, October – November 2018: fusion of modeling and observations

Svitlana Liubartseva (1), Malek Smaoui (2), Giovanni Coppini (1), Gabino Gonzalez (2), Rita Lecci (1), and Ivan Federico (1)

(1) Fondazione CMCC - Centro EuroMediterraneo sui Cambiamenti Climatici, OPA Division - Ocean Predictions and Applications, Lecce, Italy (svitlana.liubartseva@cmcc.it), (2) REMPEC - Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea, Valletta, Malta

In the early morning of October 7^{th} 2018, a Ro-Ro/passenger ship *Ulysse*, registered in Tunisia struck the hull of a Cyprus-based container ship *Virginia*, which had been anchored around 16 miles north of the French Island of Corsica. There were no casualties, but the collision caused a fuel leak of around 530 m^3, threatening the marine environment and coastal areas.

During the operational phase 11–16 October 2018, the Regional Marine Pollution Emergency Response Centre for the Mediterranean Region (REMPEC) collaborated with the Mediterranean Operational Network for the Global Ocean Observing System (MONGOOS) to obtain the scientifically sound forecasts of oil drift and fate. Apart from the overflight and satellite data, REMPEC provided a real-time coupling the information flow between MONGOOS and end users. As a result, 5 pollution forecast bulletins were delivered to competent authorities.

Oil drift and fate predictions were simulated by the Lagrangian oil spill model MEDSLIK-II (http://medslik-ii.org/). The model was forced by hourly forecast datasets on ocean currents at a horizontal resolution of $1/24^o$ provided by Copernicus Marine Environment Monitoring Service (CMEMS http://marine.copernicus.eu/services-portfolio/access-to-products/), and ECMWF wind at 0.125^o with a temporal resolution of 6 h. To calculate the Stokes drift, the empirical, so-called JONSWAP wave spectrum as a function of wind speed and fetch was used. The changes in the surface oil volume were attributable to four main processes, known collectively as weathering (evaporation, spreading, emulsification, and natural dispersion). When the oil arrived on the coastline, the model simulated the adsorption into the coastal environment, taking into account a probability that the oil may be washed back into the water.

In the present work, we have reconstructed the spill drift using (1) as many as possible observations; (2) CMEMS analyses and; (3) *a posteriori* corrected oil spill scenarios. To obtain as realistic as possible oil distributions MEDSLIK-II is repeatedly re-initialized from the observed locations.

Calculated oil drift animation shows that the coastlines of Italy, Monaco, and France were at risk of oil pollution during the operational phase. The model reveals the consistent patterns in oil trajectory foreseeing that the oil reached the coastline of Levant Island (France) on 15^{th} 2018. In reality, on 16^{th} 2018, the oil hit the coastline of Saint Tropez (France) located of $\sim$20 km from the predicted site. Simple metrics introduced demonstrate a rather good prediction skill of the model.

Model validation in the context of the real case scenarios will help to improve the forecasting quality and expand the MEDSLIK-II functionality.

This work is performed in the framework of the IMPRESSIVE project (#821922) co-funded by the European Commission under the H2020 Programme.