Hindcast of Oil Spill Pollution during the Lebanon Crisis, July-August 2006

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Abstract

The Mediterranean Operational Oceanography Network (MOON[1]) provides near-real-time information on oil spill detection and predictions that have been used during the Lebanese oil pollution crisis in summer 2006. A MOON decision support system for oil spill monitoring and prediction comprising ocean colour satellite and SAR images, ocean current forecast (MFS-Mediterranean Forecasting System and CYCOFOS-CYprus Coastal Ocean Forecasting & Observing System) and the MEDSLIK oil spill model has been developed. The oil spill predictions obtained with MEDSLIK coupled to the CYCOFOS high-resolution ocean fields are compared with the oil spill predictions obtained using the lower resolution MFS hydrodynamics and both are validated against satellite observations. The predicted beached oil quatity along the Lebanese and Syrian coasts are compared with the in-situ observations.

It is found that predictions with both CYCOFOS and MFS ar capable to simulate the northward movement of the oil, with the higher resolution CYCOFOS predictions in better agreement with satellite observations. Among the free MEDSLIK oil spill parameters tested in the sensitivity experiments there are the wind corrections (wind factor and angle) and the depth of coupling between eulerian fields and wind correction. Among them the drift factor appeared the most relevant in order to improve the quality of results suggesting that operational models such as MFS and CYCOFOS still lack of enought resolution and physical process at the air-sea interface. The oil moved from Lat 33°40'N Lon 35°24.75'E northward toward Syria, which was reached in 10 days at Lat 34° 38.451'N Lon 35° 58.377'E; the oil movement is followed up to August 6 when the oil reached 35.5°N.

[1] http://www.moon-oceanforecasting.eu

Keywords: Lebanese oil pollution event, oil spill modelling, operational oceanography, remote sensing, Levantine Basin.