The impact of wind stress in modeling of oil pollution distribution in the Persian Gulf

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Oil pollution is the release of a liquid petroleum hydrocarbon into the marine environment due to human activity such as releases of crude oil from tankers, offshore platforms, drilling rigs and piping. The purpose of this study is to use a three-dimensional hydrodynamic multi-purpose model coupled with biological and contaminant modules, in order to simulate the transport and diffusion of oil pollutants. After adjusting the model for the Persian Gulf region, the model was run to reach the steady state. The distribution of oil pollution in the different layers was predicted for different months of the year. The results show that the diffusion of oil pollution in the Persian Gulf is more affected by wind driven currents. The model also indicates that the wind stress is one of the major factors in the transport of contaminant and diffusion in the Persian Gulf and this factor leads to diffuse the contaminant concentration towards the north of the Gulf and then with a northern anticlockwise current pushing them towards the south. The results of this numerical simulation can be used in providing appropriate solutions to prevent oil from spreading further in the region.

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