

IT – OSRA: applying super-ensemble simulations to estimate the oil spill hazard associated to operational and accidental oil spills

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Every year, over 410,000 tonnes of oil are introduced to the oceans through accidental (26[*Sepp-Neves et al. (submitted to the Journal of Environmental Management)*]) proposed a new OSRA framework based on the ISO 31000:2009 standard, obtaining significant improvements compared to the original standard and to other frameworks. In addition to the inclusion of operational spills in the calculation of risk, the authors employed, for the first time in the literature, ensemble oil spill simulations to address uncertainties in the calculation of the risk. Their positive results encouraged its application to a wider area and to a more complex risk scenario. Based on the methodology proposed by [*Sepp-Neves et al.*], so-called Information Technology (IT)-OSRA, we estimated the oil spill hazard represented by vessel-related operational and accidental spills in a trafficked coastal area. Six ensemble members were generated covering different oil spill characteristics (i.e. oil density, spill volume and duration of the spill) and hydrodynamic forcings (operationally available outputs of MERCATOR, IBI-ROOS and MOHID-PCOMS systems) in order to address the main sources of uncertainties in oil spills events. Simulations were repeated along a release grid every 10 days throughout a year. The experiment was performed in the Southern Portuguese coast, Algarve. The area is known for its high ecological value and its high dependence on marine resources. Concomitantly, the area is exposed to one of the busiest maritime routes in the world in which over 200 million tonnes of oil flow yearly. The results obtained are paramount for the definition of necessary oil spill response equipment and for the positioning of traffic lanes.

REFERENCES

Sepp-Neves, A.A., Pinardi, N., Janeiro, J., Martins, F., Samaras, A., Zodiatis, G. and De Dominicis, M.,. Towards a common oil spill risk assessment framework : Adapting ISO 31000 and addressing uncertainties . Submitted to the *Journal of Environmental Management*.