Potential risk of Sicily Marine Protected Areas to oil spills' pollution

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The institution of a Marine Protected Area (MPA) is always linked to biodiversity and habitats protection needs, due to the high environmental value of the involved areas. In Sicily, three MPAs are situated close to oil ports: Capo Gallo - Isola delle Femmine MPA, Isole Egadi MPA and Isole Ciclopi MPA, respectively close to the areas of Palermo, Trapani and Catania oil ports. Because of their proximity, they were chosen to evaluate their exposure to eventual oil spill contamination from oil handling in ports as function of the environmental conditions. In order to do this, every three days a 72 hours long simulation of oil spill was performed for each port in issue, covering the whole year 2016, with the aim to determine a seasonal index of MPAs exposure to probable oil spill pollution. To perform the experiments, the integrated numerical system implemented for the project "SOS-Piattaforme e Impianti offshore" of the Institute for Coastal and Marine environment (National Research Council) of Oristano (Italy), was used. The system is composed by a hydrodynamic operational model, the Tyrrhenian and Sicily sub-Regional Model Forecasting System (TSCRM), which provided the best estimate of the local sea state (daily production) required to force the oil spill numerical model MEDSLIK-II. The surface distribution of oil spill particles obtained after each simulation was also correlated to the main currents' field and circulation features. For each season, the relative occurrence of oil particles reaching the MPAs was used to define a seasonal index of incidence, that could help responsible agencies for the arrangement of damage containment and mitigation measures in case of actual incident occurring near these sensible areas.