

## ***Interactive web services and stranding time, the new paradigm of the risk assessment from pollution at sea.***

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Intentional or accidental pollutants release at sea remains a global threat affecting world coastal areas. Ship accidents are frequent in busy waterways and they may cause chemical pollution by oil and other toxic substances with severe impacts on marine and coastal ecosystems and human health. Risk reduction and preparedness to unexpected pollution events are the objectives that policy makers and scientists pursue to build the resilience of communities. Operational risk management systems, usually based on hydrodynamic and particle-tracking models, are widely adopted tools providing efficient support in case of emergency or sustainable planning of the marine space. Here, the authors design and test, in the coastal maritime area of the Strait of Bonifacio (Mediterranean Sea), two main innovations that would bring pollution prediction systems towards a better meet of the end-user needs. The first is given by an operational and on-demand, user-prone *interactive web service* for system setup, geographical representation of the polluted area, oceanographic products and risk assessment. The second is characterized by the introduction of the *stranding time* indicator for the identification of the areas where the slicks of pollutants are expected to quickly reach the coast. A new model for risk evaluation is hence proposed to improve the planning of marine traffic and protect coastal ecosystems. The engine of the adopted numerical system is based on a core of coupled, finite elements models describing hydrodynamics, waves and particle advection and diffusion on a shared computational grid. Using lagrangian measurements, a calibration procedure provided a satisfactory parameterization of the numerical models that read boundary conditions from European, state-of-the-art ocean and atmosphere forecast systems.