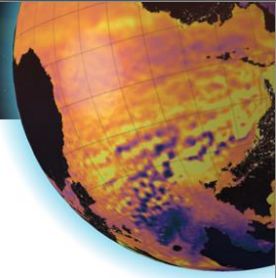




## Demonstration of three Focus Applications using the underlying models for the European Digital Twin Ocean

The European Digital Twin of the Ocean (EDITO) will provide an innovative set of user-driven and interactive decision-making tools. Within that framework, EDITO-Model Lab's Focus Applications (FAs) are demonstrators of the capabilities of the next generation of ocean models that the project is building. We will deliver our Focus Applications with high technology readiness level within three thematic areas that are related to key EU policy questions: marine biodiversity, greenhouse gas emissions from maritime shipping, and marine pollution. The FA on marine biodiversity maps habitat suitability and produces biodiversity indicators. This enables the creation of third-party services that support policy makers in effectively (re-)assigning the targeted Marine Protected Areas and (re-)defining active legislation that facilitates the EU Biodiversity Strategy and other international goals such as the those in the EU's Nature Restoration Law, that states that 30% of the ocean should be conserved and 30% of degraded ecosystems need to be restored by 2030. The FA on zero-carbon shipping provides optimal routes for large ocean-going vessels to enable the saving of fuel and carbon emissions. Preliminary tests indicate that EDITO's route optimisation can help to save on the average 5% of the emissions, with two-digit percentage savings on specific dates. This is a crucial step for the EU's Sustainable and Smart Mobility Strategy and for a more sustainable Blue Economy. In parallel, this FA can represent a contribution to the decarbonisation strategy of the International Maritime Organization. The FA on zero marine pollution targets oil spills and microplastics. The application on oil spills enables the calculation of coastal oil spill hazard index and cumulative oil spill trajectories for operational events, thereby increasing disaster preparedness and strengthening disaster response capacities, in line with the goal of the European Civil Protection and Humanitarian Aid Operations agency. The application on microplastics simulates the fate and pathways of microplastics, which enables policymakers to design the most effective measures to reduce the amount microplastics in the Baltic Sea, and in the global ocean, in line with the EU Zero Pollution Action Plan. The FAs are interactive virtual demonstrators hosted on the EDITO platform that incorporate powerful technical components (such as data, software, and computational infrastructure) into a user-friendly environment. To provide transparency into the technical solution, input datasets, all processing tools, and the generated outputs will be published in different formats through various channels. This enables the fast creation of new user applications.



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