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## **Sediment Transport Modeling to Forecast Coastline Changes due to New Port of Fiumicino (Central Latium Coast, Italy)**

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Anthropic impacts mainly affect the coastal areas by the building of ports and the changing of courses of rivers. These activities can potentially interact with the natural coastal dynamics which are ruled by complex climatic, hydrodynamic and sedimentary processes.

Preliminary studies on the environmental impacts are increasingly necessary because the potential disturbances could affect natural coastal system at different spatial and temporal scales. Hydrodynamics and sediment transport models use specific equations to be basing on depict actual phenomena and expect future scenarios.

The present study aims to predict the environmental impact of the building of the new port of Fiumicino (central Latium coast, Italy), in a stretch of coast extended from Capo Linaro to Capo Anzio interested by Tiber River dynamic. Using numerical models, we have been able to give a prediction of the coastline evolution before and after the port construction, with particular attention to the sediment dynamic in the coastal areas affected by high ecological values such as nurseries, seagrass meadows and coastal dunes.

The coastal morphology changes have been investigated using the LITPACK (Littoral Transport and Coastline Kinetics) module of the software MIKE0 developed by the Danish Hydraulic Institute (DHI), a one-dimensional model which describes the dynamic processes that determine the shoreline evolution. The model has been fed with morphology and granulometric data collected along the study area in the 1990, as well as the wave parameters achieved by the WAM model included in COPERNICUS catalogues. LITPACK model has been validated using short- and long-term simulations, comparing the results of the historical analysis of the coastline in the period 1990-2021.

Finally, future scenarios have been carried out to investigate the contribution of the effects of the new port building on the morphological coastline variation.