



An 'Early Warning System' for the prevention of dredging potential impacts on sensitive areas

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Coastal marine ecosystems are increasingly subject to multiple pressures and stressors produced by the effects of human activities. Intense and frequent disturbances which affect marine environment can derive from dredging activity, which is a fundamental management for most ports and harbours. The potential environmental effects of dredging procedures are generally due to the excavation of material from the sea bottom and the relocation elsewhere for disposal, overflow from the dredger and loss of material from pipelines during transport.

Depending on the location and the intensity of these activities the marine environment, particularly sensitive areas, may be affected by dredging. The main environmental effects can be associated with suspended sediments and increases in turbidity into the water column, which can have adverse effects on marine animals and plants by reducing light penetration and by physical disturbance.

For this reason it is fundamental to implement a real time monitoring system to control and prevent negative effects, enabling a rapid response to adverse water quality conditions and a fast activation of mitigation procedures, in agreement with all the reference authorities.

In this work we present the development of an innovative 'Early Warning System' based on fixed stations, ad hoc in situ surveys and forecasting models, which was applied to a dredging activity carried out in the Gulf of Gaeta (Latium, Italy). It represents an extension of the C-CEMS (Civitavecchia Coastal Environmental Monitoring System) network, which is operative in the Tyrrhenian sea since 2005.