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Development of innovative remote sensing techniques and tools for mapping marine bioindicators and their potential responses to specific anthropogenic pollutants

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The coastal marine environment is a key area for humans with more than 40% of the European population concentrated on coastal regions. Coastal areas are densely populated and often host industrial activities which have the potential to generate pollution.

Anthropogenic impacts overlap with climate change that can amplify the effects of pollution on marine ecosystems.

A modern strategy of investigation of the coastal marine environment requires the development of remote sensing methods useful to acquire information on numerous characteristics of marine ecosystems. Particular attention is given to the mapping of benthic ecosystems which are capable to record the effects of pollution events and could respond with changes in their composition and community structure, but also in the spectral signature as already studied for some algal species. Importance is given to the selection of new bioindicators to assess the ecological quality of benthic biocenosis of coastal marine ecosystems through remote sensing observations, integrating platforms data at different spatial scales. Moreover, once the target species have been identified, it is possible to interpret variations in the spectral response that allow to identify and quantify the impacts of pollutants that are released into the sea directly or indirectly by human activities.

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