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### Multi-source data integration in assessing the Environmental Status of the Basque Coast (Bay of Biscay)

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#### Abstract

In the context of the Marine Strategy Framework Directive (MSFD 2008/56/EC), a multidisciplinary study was carried out, with researchers from different disciplines, bringing together solutions for management practitioners in the Basque coastal zone (SE part of the Bay of Biscay). This area was selected as case-study and divided into Marine Reporting Units (MRU), following the MSFD terminology, collating, and integrating information from coastal and offshore marine areas, from a variety of sources (i.e., *in-situ* long-term monitoring data, data coming from annual/triannual surveys, multibeam data, satellite data, open-source data, etc.). These data, from a period of 2010 to 2019, were used to assess the environmental status in a holistic way, by using NEAT (Nested Environmental status Assessment Tool). A total of 68 indicators were used, covering several ecosystem components: physico-chemistry of sediments and waters, phytoplankton, benthic fauna and flora, fish, birds, mammals, alien species, and litter. The analyses include spatial scenarios (weighting and no weighting by MRU), as well as filtering by different MSFD descriptors (i.e., biodiversity, alien species, eutrophication, sea floor integrity and contamination).

NEAT classified the Basque coast into good status, with no clear spatial gradient in the status. Most of the ecosystem components were classified in high and in good status, except mammals, birds (in territorial waters) and some commercial fish species (*Merluccius merluccius*, *Trachurus trachurus*, *Lepidorhombus whiffiagonis* and *Sardina pilchardus*) classified in poor and in bad status, depending on the species. The main human pressure, affecting the area is fish trawling. In addition, it is evident that the more indicators were used, the more representative is the assessment of the area. We show the ways to combine this wide range of complex information for the assessment of the health status and for the management of coastal and marine waters.

#### Keywords

environmental assessment, holistic approach, Nested Environmental status Assessment Tool, coastal and marine management