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Linking species and habitat observations: Cross-Thematic Integration in EMODnet for Context-Enriched Marine Biodiversity Data

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Abstract
The European Marine Observation and Data Network (EMODnet) is a marine data service providing free access to harmonized and FAIR data and data products. The data holdings and products of the seven disciplinary themes – bathymetry, geology, physics, chemistry, biology, seabed habitats and human activities – are presented on the EMODnet Portal, spanning the entire marine environment from coast to open ocean and seafloor, while also supporting Blue Economy sectors and Maritime Spatial Planning, policy, research and civil society.

EMODnet Biology and EMODnet Seabed Habitats curate complementary datasets: EMODnet Biology focuses on marine species occurrences, while EMODnet Seabed Habitats collates habitat data as point records and maps. While these data might be collected together during surveys, they have traditionally been published and stored separately, limiting their use in ecosystem-level analyses.

In response, the two themes have launched a cross-cutting collaboration to integrate species and habitat point data, led by VLIZ (Flanders Marine Institute) and JNCC (Joint Nature Conservation Committee), and enabling enriched biodiversity datasets that are more ecologically informative and ready for synthesis. This initiative uses Darwin Core, the biodiversity data standard to publish linked taxa–habitat records, applying shared identifiers and protocols to maintain their association.

This effort aligns with broader initiatives to incorporate contextual data into global biodiversity platforms, such as OBIS or GBIF, via the Darwin Core extended Measurement or Fact (eMoF) extension which allows for the use of controlled vocabularies, thus improving interoperability between datasets and different types of data. It supports improved modelling, ecosystem assessments, and policy reporting (e.g., EU Marine Strategy Framework Directive and the EU Nature Restoration Law). The approach offers a replicable model for adding ecological context to biodiversity records and lowering barriers to interdisciplinary marine data integration.