Ichthyoplankton assemblages and fish early life stages dispersal pathways in the South-Central Tyrrhenian Sea

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Project Summary

The South Central Tyrrhenian Sea (STCS) (mid-western Mediterranean) is a transition zone of physical processes and bathymetries, and hosts highly diversified and productive fish assemblages. It is characterized by a relatively shallow shelf and the presence of two large canyons: the Dohrn canyon, in the middle of the Gulf of Naples, and the Cuma canyon at the south end of the Gulf of Gaeta. Submarine canyons are hotspots of species abundance and biodiversity (including cetaceans), provide spawning and nursery habitats for slope and demersal fish species, and favor the exchange of planktonic organisms and nutrients between the deep sea and shelf habitats.

Although this is one of the most intensely and productive fisheries regions of the Tyrrhenian Sea, ichthyoplankton assemblages in the STCS are poorly known. We lack an understanding of how ichthyoplankton assemblages vary over space and time, especially in correspondence of bathymetric features, such as shelf-slope edge and submarine canyons.

The present PhD proposal is aimed at observing, understanding, and modeling key bio-physical properties that affect the distribution, abundance, and population structure of marine fish during early life stages.

The PhD project will conduct two main activities:

- Observation: oceanographic and biological properties, at key locations and during different stages of fish early life, will be monitored with the use of state of the art technologies.
- Modeling: numerical simulation of fish early life stages including larval drift pathways, distribution, and connectivity among populations and habitats.

The expected results will provide new scientific knowledge on the impacts of multiple stressors and climate variability on fish assemblages in the STCS. Besides preparing the next generation of marine ecosystem oceanographers, the proposed project will provide data and infrastructures necessary to sustainable manage coastal fisheries. The study leverages existing projects and members of the team are outreaching with local schools and engaging with regional managers to foster the link between data, knowledge, discoveries and user-inspired applications.