

Call for applications

Agrocampus Ouest doctoral thesis in Marine Ecology

Benthic communities and benthic-demersal trophic functioning of the continental shelf of the north bay of Biscaye

The continental shelves provide many goods and services today threatened by global change and human activities. Components of the ecosystem's biodiversity, benthic invertebrate communities play a key role as an interface in trophic flows between primary resources (phytoplankton and detrital matter) and benthic-demersal predators (mega-invertebrates, fish) many of which are exploited. Knowing this interface therefore has a double interest as a key to understanding trophic functioning and to the state of these ecosystems of recognized ecological and economic interests.

This project focuses more particularly on the northern part of the continental shelf of Bay of Biscaye. Its hydrological characteristics are known, as are the dynamics of primary production, largely supplied by nutrient flows from the Loire. Nevertheless, knowledge of benthic-demersal communities and their functional role is fragmentary and heterogeneous. Thus, coastal areas (infralittoral) are the most studied compared to offshore areas (circalittoral) yet under increasing pressure from human activities and global change.

The objective of the project is to assess the spatial variability of the trophic functioning of the continental shelf, to identify the own traits of the circalittoral zones and, to contribute to the determination of the ecological state in the context of European directives. The project is based on the study of the taxonomic and functional characteristics of benthic invertebrate communities (macrofauna and megafauna) and their interactions with each other and with benthic-demersal ichthyofauna over four areas of the plateau distributed according to a coast / offshore gradient. The work will be based to a large extent on data which are now available, but could be supplemented by new sampling scheduled for recurrent sea cruises.

Four main steps have been planned. The first concerns the determination of the environmental context (natural factors and anthropogenic pressures) of the areas studied with the objective of its determinism on the structural and functional patterns. The second concerns the determination of the structural and functional characteristics of benthic communities. The third step is centered on trophic interactions and macrobenthic productions. Finally, the last step is devoted to the characterization of the ecological state in view of the knowledge acquired on general functioning via the relationships between biodiversity and trophic processes.

The project is led by three scientific partners belonging to the Institut Agro / Agrocampus Ouest (Rennes), Ifremer (Nantes) and IUEM (Brest).

The candidate should have a solid knowledge of marine ecology. As the thesis needs the constitution of databases and statistical analyses (RDA, GLM, GAM ...), the candidate must have a proven mastery in data analysis and programming (R language).

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