

## Call for applications

### Agrocampus Ouest doctoral thesis in Marine Ecology

#### **Biodiversity and trophic carrying capacity of estuarine nurseries in the English Channel and the Atlantic: case of the Loire estuary over thirty years**

Coastal and estuarine ecosystems are subject to local pressures (port activities, coastal developments, chemical contaminations) and global pressures (river flows decrease, temperature and water level increases). Ecological functions can be affected, particularly the renewal of marine populations through the nursery function of these areas. The question thus arises for nurseries in the Channel and the Atlantic, and particularly for the Loire estuary.

The objective of the thesis is to assess over thirty years how the biodiversity and the trophic carrying capacity of this ecosystem have evolved in its various sectors. Their analysis as markers of stability or plasticity and availability of food resources should make it possible to account for possible modifications of the nursery function of juvenile benthic-demersal species. The trends observed can be compared with those of other European estuaries (*e.g.* Seine).

This project will jointly study the spatial dynamics (estuarine sectors) and temporal (thirty years) of the taxonomic and functional diversities of the communities of benthic macro invertebrates and of juvenile species of benthic-demersal fish. Then it will investigate more particularly the trophic relationship between these two components by means of the estimation of the production of benthic prey, on the one hand, and of the consumption of juvenile fish which feed on them, on the other hand, according to an approach similar to those carried out in other nurseries<sup>1</sup>. The project will take as a reference the state of the communities at the beginning of the 1980s<sup>2</sup> and will mobilize the historical series of densities and biomass data collected to date which will be analyzed from the start of the thesis. In addition, sampling campaigns will be carried out in 2021 in order to provide a possible contemporary picture of the characteristics of the two communities over all sectors and their functional links. The results could be placed in a Channel-Atlantic context, particularly in collaboration with European scientific partners.

The work of this thesis is part of the Biotrol<sup>3</sup> project led by Agrocampus Ouest (Rennes), Ifremer (Nantes) and the Bio-Littoral study office (Nantes). The thesis will be supervised jointly by Anik Brind'Amour (Ifremer Nantes) and Hervé Le Bris (Agrocampus Ouest, Rennes) and will take place half in Rennes and Nantes.

The candidate should have a solid knowledge of freshwater or marine ecology. As the thesis needs the constitution of databases, multivariate analyzes, time series analyzes and modeling approaches (GLM, GAM ...), the candidate must have a proven mastery in data analysis and programming (R language).

Recruitment: March 2021. Closing date for receipt of applications: January 18, 2021.

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<sup>1</sup> Tableau et al., 2019. Novel approach for testing the food limitation hypothesis in estuarine and coastal fish nurseries. ([doi.org/10.3354/meps13090](https://doi.org/10.3354/meps13090))  
Saulnier et al., 2020. Food limitation for juvenile marine fish in a coastal and estuarine nursery. ([doi.org/10.1016/j.ecss.2020.106670](https://doi.org/10.1016/j.ecss.2020.106670))

<sup>2</sup> Marchand, J. et Elie, P., 1983a. Contribution à l'étude des peuplements de l'estuaire de la Loire. Etude CSEEL, 3 : 1-128.  
Marchand et Elie, 1983b. Contribution à l'étude des ressources benthico-démersales de l'estuaire de la Loire. Etude CSEEL, 4 : 1-159.

<sup>3</sup> Financement : Agence de l'Eau Loire Bretagne, Région des Pays de la Loire, Grand Port Maritime de Nantes St Nazaire