24 months postdoc position in benthic coastal ecology/impacts of non-indegenious species available the University of Bordeaux (UMR 5805 EPOC laboratory)

Context:

Coastal ecosystems host intensive human activities and then have to face so-induced multiple threats and pressures (i.e. eutrophication, seafloor abrasion, coastal erosion, invasive non-native species introduction). More specifically, the introduction of « non-native » species must retain special attention because at the same time contributing to biodiversity but also adversely affecting benthic habitats structure and functioning.

The Asian date mussel *Arcuatula senhousia* (Benson, 1842) is a small mytilid bivalve occupying coastal soft sediments where it lives semi-buried. It has successfully colonized many coastal/estuarine ecosystem worldwide, thereby altering benthic biodiversity and ecosystem functioning, especially within seagrass meadows. In Arcachon Bay (southwestern French Atlantic coast), *A. senhousia* mostly occupies dwarf eelgrass *Zostera noltei* meadows, and until recently never reached high abundances comparable to other previously invaded ecosystems. These last years, Field observations have however shown a clear increase in *A. senhousia* densities, suggesting a progression in the invasion process.

The research project ARCUATULA (2022-2025), jointly funded by the French Office for Biodiversity and the University of Bordeaux, then aims at:

-Quantifying the population dynamics as well as the surface area colonized by *A. senhousia* within the Arcachon Bay, as a working example of the invasion process in the French Atlantic coasts. It will also consist in the characterization of the main environmental drivers associated with the observed dynamics. Finally, this work aims at establishing a typology for Atlantic coastal ecosystems and habitats prone to be colonized/invaded by the Asian mussel.

-Quantifying the impacts of *A. senhousia* invasion on biodiversity and ecosystem functioning within *Z. noltei* seagrass meadows. More particularly, it will consist in the evaluation of such impacts given the complex relationships existing between the Asian mussel and (1) benthic community structure, (2) seagrasses, (3) exploited bivalve species (clams, oysters) and (3) macroalgae, as well as on (5) biogeochemical fluxes across the sediment interface.

-Exploring the effects of Extreme Climatic Events (marine and/ or atmospheric heatwaves, extreme precipitation (rain) events, those frequencies of occurrence are very likely to increase with climate warming) on invasion dynamics of *A. senhousia* and associated impacts. These objectives will be achieved through a combination of the analysis of costal ecosystems observation data and ex-situ (mesocosm) manipulative experiments.

Responsibilities and tasks:

Under the responsibility of the research project PIs and in close collaboration with the other researchers and technicians involved, the Postdoc researcher will coordinate the research activities needed to achieve successfully the objectives of the ARCUATULA project. He/She will carry out field sampling and survey during a full seasonal cycle. He/She will design and run experiments in controlled conditions. He/She will also participate to the different lab analyses of the gathered sampled (benthic macrofauna identification and biometry, seagrasses; sediment biogeochemical characteristics, Carbon

and Nitrogen stable isotopes) and lead the analysis and the interpretation of the results, taking into account existing literature and external datasets (metadata, meteorological data, numeric model outputs…). He/She will participate to the writing of projects reports and deliverables, and write scientific articles.

Profile:

-Phd in Marine Biology/Ecology

-Advanced knowledge in community ecology, seagrass meadow ecology

-Advanced knowledge in population dynamics and/or benthic biogeochemistry (fluxes) and/or foodweb (isotopes)

-Advanced knowledge and skills in data analysis and statistics

-Experience with experimental design

Skills:

-Field sampling in sometimes-difficult conditions

-Advanced skills in data analysis of complex datasets (data of different nature), familiar with statistic (R) and GIS tools.

-Communication and collaboration skills, organization

-Good written and oral skills in English

-Driving license

Contract duration:

24 months

Salary:

Varying depending on the experience of the candidate

Starting date:

Between November 2022 and January 2023

Workplace:

Arcachon marine station (UMR 5805 EPOC CNRS/U. Bordeaux) and/or Ifremer station of Arcachon

Application and Contacts:

To apply, please provide a curriculum vitae and statement of research interests (contact information for references will be appreciated) before the **3rd of October** to:

-Hugues Blanchet (UMR EPOC) hugues.blanchet@u-bordeaux.fr

-Guillaume Bernard (IFREMER LERAR) guillaume.bernard@ifremer.fr