



**18-month post-doctoral position on the quantitative declination of socio-economic scenarios and the definition of indicators for marine ecosystems (health status, ecosystem services)**

BAP N°      A1D47  
GRADE      IR

**1-General information**

- Workplace : Technopole de l'Arbois, Aix-en-Provence, France
- Publication date : January 2025
- Contract duration : 18 months
- Starting date : as soon as possible
- Workload : Full time workload
- Remuneration : according to experience (between 2616 € and 3063 € gross)
- Desired level of study : PhD
- Application deadline : open until selection is made

**2-Missions**

The [MEDIATION](#) project aims at designing methodological developments to produce multi-decadal regional projections of the physical and biogeochemical/biological dynamics of marine ecosystems that are robust and sufficient in number to explore a diversity of trajectories. In this context, the mission of this post-doctoral position is to develop ready-to-use regional quantitative scenarios to force the modeling chains implemented in the project, as well as to define the key indicators that will allow the projections to be compared to each other.

**3-Activities**

The first part of this post-doctoral project will focus on the development of a variety of multi-factorial forcing scenarios, in order to explore the associated trajectories of marine ecosystems in the Channel-Gascona and the Mediterranean. Since the last IPCC report, each SSP scenario associates a radiative forcing trajectory with a narrative summarizing the societal choices potentially made by the end of the century. These narratives need to be translated into a quantitative form before they can be applied to the integrated modeling chain combining atmospheric, aerosol and atmospheric chemistry, hydrological, agro-systems, ocean circulation, and low and high trophic level marine ecosystems models.

The different scenarios of nutrient discharge by rivers and runoff will be generated using the LPJmL model (Bondeau et al., 2007, Fader et al., 2015) for the Mediterranean basin countries (with a focus on France). This implies to have generated beforehand quantitative forcings to be applied to the LPJmL agro-ecosystem model (population, wastewater, land use, agricultural system, inputs, irrigation,...). These forcings will be either regional declinations of the SSP scenarios, or derived from an economic model developed during a previous project. This methodology should also be applied to the calculation of continental discharges for the Channel-

Gascoa region, or failing that, these will be generated through other more direct methods. Fishing scenarios, developed by members of the project team, will also be implemented during this post-doctoral project for the two configurations encompassing the French mainland coast. More theoretical scenarios for fishing or continental forcing can also be developed on several scales.

Another aspect of this post-doc will be to analyze the nitrate and phosphate outputs from the different scenarios, in order to identify the most contrasting scenarios that will be used to force the marine model. A quantification of the uncertainty on nitrate and phosphate outputs could be carried out on one of these scenarios.

#### **4-Skills**

The candidate will have a background in ecology and/or environmental sciences and/or geography and/or environmental and natural resource economics. He/she should be comfortable with the Linux environment and with the Python and/or R languages. Experience in handling large databases (raster/vector data, Excel databases), particularly with GIS software, and/or in numerical modeling will be a plus.

#### **5-Work context**

The candidate will be assigned to the IMBE (Institut Méditerranéen de Biodiversité et d'Écologie marine et continentale), at the Arbois site (near Aix en Provence) and will interact mainly with Alberte Bondeau (CNRS researcher) and Dominique Ami (professor of Economics at Aix-Marseille University, Lab of Sociology and Economics of Labor).

#### **6-Constraints**

The subject requires in essence to collaborate with many people, either by videoconference, or in the form of travel and/or stays outside the laboratory if necessary.

#### **7-Contacts**

Send CV, cover letter, and two reference letters to :

alberte.bondeau@imbe.fr, dominique.ami@univ-amu.fr, melika.baklouti@univ-amu.fr

