



MEDIATION project

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 : May 2023
- Contract duration : 18 months
- Starting date : October 2023
- Workload : Full time workload
- Remuneration : according to experience
(between 2173 € and 2697 € gross)
- Desired level of study : PhD

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) 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 will also be constructed during this post-doctoral project for the two configurations encompassing the French mainland coast. In addition to regional scenarios developed with stakeholders for the French fisheries, more theoretical scenarios will also be developed at several scales.

The other part of this post-doc will focus on the definition of integrative quantitative indicators that will allow the comparison of the different socio-economic-climatic projections that will be made. These indicators (intended for "end-users" and developed, as much as possible, in consultation with stakeholders) will aim to summarize in a quantitative way the state of marine ecosystems and ecosystem services they provide, based on what already exists in the bibliography in a first approach, and by proposing new indicators better adapted if necessary. The implementation of these indicators and the evaluation of their relevance will be tested on an existing 3D historical simulation.

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.

The candidate will also have to show a great capacity to take initiatives, in particular to interact with different interlocutors within the MEDIATION project and outside (associations, fisheries stakeholders, researchers not involved in the project...).

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 at the University of Aix-Marseille).

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

