

## POSITION ANNOUNCEMENT

Research Associate (Postdoctoral): Effects of climate and socio-economic changes on ecosystem services provided by the Mediterranean region using an integrated terrestrial-marine model

**Deadline for application:** September 30, 2018.

**Employer:** Aix-Marseille University (France), LabEx OT-Med

**Location:** Marseille (MIO) and Aix-en-Provence (IMBE)

**Duration:** 18 months, starting on November 1<sup>st</sup> 2018.

### General context

This post-doc fellow will be engaged in the Laser-Med project (Towards an integrated prediction of Land & Sea Responses to global change in the Mediterranean Basin), a multi-disciplinary project involving economists, agronomists, geographers and oceanographers, funded by the “laboratoire d'excellence” Labex *OT-Med* (see: <http://www.otmed.fr/>) which includes ten research laboratories and one research federation specialized in different fields: environmental sciences, law, economics and social sciences.

The main objective of Laser-Med is to study the impact of climate and land use changes on key ecosystem services provided by the terrestrial and marine ecosystems. This goal will be achieved by the integration of state-of-the-art models for agroecosystems (LPJmL) and marine ecosystems (NEMO-MED12/Eco3M-MED) models forced by a common regionalized RCP 8.5 climate scenario (Sevault et al., 2014, Damaraki et al., in prep.).

The agrosystem model (LPJmL) is a coupled global vegetation and hydrological model which simulates the carbon and water fluxes between the soil, the vegetation (including the harvested part), and the atmosphere. Nine plant functional types represent the potential natural vegetation and eighteen crops and managed grasses represent agriculture. The model is written in C, more details can be found in Bondeau et al. (2007), Rost et al. (2008), and Fader et al. (2015, 2016). The representation of the nutrient transfer from land to sea has been introduced in the frame of the present project. The marine model combines a physical regional model (NEMO-MED12) and a biogeochemical model (Eco3M-Med). Both models are written in Fortran 90. The physical model is driven by atmospheric forcings and simulates marine dynamics at a 1/12° spatial resolution (Hamon et al., 2016). The biogeochemical model includes 6 compartments of the planktonic food web (from bacteria up to mesozooplankton) with variable stoichiometry. More details can be found in Baklouti et al. (2006a,b), Alekseenko et al. (2014) and Guyennon et al. (2015). The marine model also provides inputs for a Lagrangian jellyfish model.

A further objective is to investigate the impact of changing climate and socio-economic (SE) conditions on terrestrial and marine ecosystems. To do this, SE scenarios, already available at this stage, are used to explore the effects of agricultural practices and land-use/land management on food availability and sufficiency for the Mediterranean populations, also taking also into account their ecological footprint. These scenarios will force the agro-ecosystem model (through land-use and land-management) and indirectly impact the marine model through rivers discharge and water runoffs.

### Specific mission of the post-doc fellow

This post-doc will join the LaSeR-Med project in its concluding phase. The work will therefore benefit from the development and validation efforts already done on the terrestrial and marine models. The expected task are:

- (i) running the remaining climatic and socio-economic scenarios with the terrestrial and marine models and the Lagrangian-Individual Based model for the jellyfish *Pelagia noctiluca*,
- (ii) analyzing the outcomes of these calculations for relevant indicators (to be defined),
- (iii) contributing to the synthesis of the project outputs through the writing of several high impact scientific publications

### Desired skills and experience

Candidates must hold a Ph.D. degree, or equivalent, in geophysical, environmental, or geographical sciences

(terrestrial or marine). He/She should have an experience in running complex numerical models, processing large datasets, and be comfortable with geospatial analyses and mapping. Strong analytical and summarizing skills, fluency in English and good capacity to write articles in high impact journals are required. Knowledge of the Mediterranean area will be an advantage. The candidate should be familiar with the Linux/unix environment, with the C and FORTRAN 90 languages, and with R or Python

## Appointment

Full-time, 12-month fixed-term appointment. The monthly salary is about 1900-2400 € (depending on qualifications and professional experience). The funding is for 18 months. Support is also available for travel expenses, equipment, and supplies.

The candidate will be based in Marseille (Luminy campus) but will have to make regular visits to the other labs, especially in Aix-en-Provence (Arbois campus), or in AMSE (center of Marseille).

## Application procedure

Candidates should submit their application along with the following supporting documents: motivation letter and CV (with contact details and personal data, degrees, language skills, computing skills, work experience and a list of degree projects/theses/publications) in pdf format. At least one reference is also required.

**Applications should be sent to [melika.baklouti@univ-amu.fr](mailto:melika.baklouti@univ-amu.fr), [alberte.bondeau@imbe.fr](mailto:alberte.bondeau@imbe.fr) and [dominique.ami@univ-amu.fr](mailto:dominique.ami@univ-amu.fr)**

## References

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