Postdoctoral position

Modelling the dynamics and exploitation of large pelagic fish in global marine ecosystems. Analysing MPA scenarios from the perspective of the CBD's 30 by 30 target and the BBNJ agreement.

https://umr-marbec.fr/poste/marbec-sete-postdoctoral-position-modelling-the-dynamics-and-exploitation-of-large-pelagic-fish-in-global-marine-ecosystems/

We are advertising a 36-month post-doctoral position funded by the FFEM / TARA project PlanktEco and the PEPR BRIDGES project AVATAR.

We are seeking a talented quantitative scientist to work at the intersection of marine ecosystem modelling, bio-economic fisheries modelling, and biodiversity conservation. The position is based in Sète, France, in the MARine Biodiversity, Exploitation and Conservation (MARBEC) laboratory (https://umr-marbec.fr/en/).

The successful candidate will use the marine ecosystem model APECOSM[1] to simulate the dynamics of **global marine ecosystems**, from physics to fish communities. He/she will also use the APECOSM bio-economic **fishing fleet** module, which will be coupled to the FishMIP-OSP modelling framework (Maury et al., 2025) to represent the **exploitation of the modelled communities by artisanal and industrial fleets, as well as the associated markets**. He/she will focus particularly on the two communities of large oceanic predators represented in the model (see Dalaut et al., 2025), as they underpin oceanic fisheries. Historical simulations will be compared with available **fishery catch, effort and price** data to assess the model's performance. Using the coupled modelling framework, the postdoctoral scientist will simulate **future MPA implementation scenarios** in areas beyond national jurisdiction (ABNJ), following the **OSP Nature Future Framework protocol** (OSP-NFF) planned in the FishMIP-OSP project (see Maury et al., 2025). This protocol is dedicated to mapping the SSP-based OSP scenarios to the **IPBES perspective** that is conveyed in the NFF scenarios (Pereira et al., 2020; Kim et al., 2023). The OSP-NFF scenarios consist of alternative **transition pathways towards sustainability**, incorporating climate and socio-economic changes. These scenarios will enable the study of the ecological and socio-economic effects of various **MPA development scenarios** in the open ocean.

[1] APECOSM (e.g. Maury, 2010; Dalaut et al., 2025a and b) is a 3D eulerian marine ecosystem model that represents the dynamics of size-structured communities (small and medium epipelagic organisms, large oceanic predators -e.g. skipjack and yellowfin tuna-, large deep-diving predators -e.g. bigeye tuna, swordfish-, migratory and resident mesopelagic organisms, demersal and benthic fish, and benthic invertebrates). It integrates individual, population and community levels mechanistically with a trait-based approach (Maury & Poggiale, 2013). In APECOSM the uptake and use of energy for individual growth, maintenance, development, reproduction and mortality are modelled according to the DEB theory (Kooijman, 2010). Physical drivers from the OGCM NEMO (temperature, currents, mixing) as well as biogeochemical drivers from PISCES (phytoplankton, zooplankton, particles, light and oxygen) control the biological and ecological dynamics at various levels in APECOSM.

Duration and salary: The successful candidate will be hired by IRD for a maximum of 36 months. Salary will depend on experience and will be in accordance with IRD rules. Social security and paid leave will be in accordance with French legislation.

Required Experience: A PhD is required, with an experience in oceanography, fishery science, marine ecology or bio-economy, as well as very good quantitative skills (applied mathematics or engineering) and a strong interest for numerical modelling. The ability to use linux and programming languages (python, C/C++) is necessary, as is the ability to write scientific publications.

Contact for applications: Applications should be sent as soon as possible to Olivier Maury (olivier.maury@ird.fr). They should include a CV with publication record, a statement of research interests and the names of two referees. Review of applications will begin as soon as received, and the position will remain open until filled.

References:

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