

Project Endorsement Form

1. PROJECT TITLE

Full title	MA he Plateau ecosystem Survey
Acronym	MAPS
Website	To be developed later as a dedicated page under the MARBEC web site
Keywords (up to 10, describing the project research)	Artisanal fisheries, population abundance, acoustic survey, fish tagging, ocean acidification, microplastics
New initiative or continuing programme?	New

2. APPLICANTS

Lead applicant / Project Leader / key research contact person:

First name	Francis
Last name	Marsac
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Other key participants / research team leaders: (repeat as needed)

First name	Pascal
Last name	Bach
Role in the project	Fishing and tagging operations
Affiliation	Institut de Recherche pour le Développement (IRD), MARBEC
Country	France
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First name	Vincent
Last name	Lucas
Role in the project	Fisheries management and marine spatial planning
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First name	Laure
Last name	Corbari
Role in the project	Benthic biodiversity survey
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N.B.: Please note that all these names and contact details will be added to the IIOE-2 membership database.

3. ABSTRACT– Brief description of the project: (1/4 page maximum)

This will be placed on the IIOE-2 Website after endorsement.

The Seychelles is currently developing the National Blue Economy Roadmap to diversify the economy, create high value jobs, ensure food security, and sustainably manage and protect the marine environment. Fishing is the second most important sector in the Seychelles economy after tourism. The artisanal fishery, with 1500 fishers and an annual production of 4000 tons (valued as 12.5 million USD) is of paramount socio-economic importance to the Seychellois. There are signs of overfishing for several demersal fish stocks and a rebuilding programme is underway. A Marine Spatial Planning is also being developed to allocate activities minimizing impact on ecosystems. These aims require a consolidated scientific background. The MAPS cruise will perform novel multidisciplinary observations on the Mahe Plateau. It will assess trends in the abundance of demersal fish stocks by using the results of research cruises undertaken in 1979 and 1980 as a baseline, evaluate changes in carbonate system parameters from historical data and contemporary pCO₂/pH and total alkalinity measurements (SDG 14.3), and finally will investigate a possible jellification of the area by comparison with previous work. MAPS will deliver through 7 specific objectives : 1) to update of the seabed topography of the Mahe Plateau; 2) to describe the circulation, physical, chemical and biological properties of the Mahe Plateau during the inter-monsoon season; 3) to investigate the spatial distribution of the demersal fish species by acoustic methods; 4) to provide abundance indicators of demersal fish stocks of major importance for the artisanal fishery by fisheries-independent methods; 5) to describe the movements of demersal fish and connectivity across the Mahe Plateau; 6) to explore hotspots of marine benthic biodiversity in selected sites; 7) to assess the degree of contamination by microplastics of the most consumed demersal fish. The measurements will include temperature, salinity, dissolved oxygen, fluorescence profiles, pH, total alkalinity, currents (S-ADCP and L-ADCP), chlorophyll pigments and macro-zooplankton abundance. Demersal fish will be tagged to investigate movements and connectivity over the Plateau. Microplastic particles will be searched by filtering water collected at various depths and in the stomach contents of the fish. MAPS will be conducted with the French R/V ANTEA, a 35 m catamaran, that can accommodate a crew of 10 scientists. The 2-month cruise will be composed of 3 consecutive legs of 18 days each. Scientists from France (IRD, National Museum of Natural History, University of La Réunion) and Seychelles (Seychelles Fishing Authority, University of Seychelles) will work together on the vessel.

4. LINKS TO IIOE-2 SCIENCE PLAN: (1/2 page maximum)

How do you anticipate your project to contribute to the IIOE-2 strategy and science delivery, with reference to which (either one or more) of the six IIOE-2 Science Plan themes that your project responds. Please state the specific issues and questions addressed by your project in the context of the IIOE-2 Science Plan themes and key issues.

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MAPS qualifies as a science-to-governance project by addressing societal issues of a Small Island Developing State (SIDS): sustainable artisanal fisheries and marine spatial planning in order to develop an optimized national fisheries and environmental policy in Seychelles. Ensuring fish stocks are kept in good health is critical as 90% of the production is sold on the domestic market, reminding that Seychellois are among the highest fish consumers per capita globally (57 kg). IIOE-2 has been designed to stimulate good science to support development goals. By implementing core research activities to fill knowledge gaps and to inform policies, MAPS reflects well the spirit of IIOE-2.

Moreover, MAPS includes a capacity building component which is also one of the IIOE-2 foci. The scientific crew will include French and Seychellois scientists, and several Seychellois students of the University of Seychelles will rotate to participate in the three legs of the cruise.

In terms of alignment to the IIOE-2 scientific themes, MAPS is connected to two of them: ST1 “Human benefits and impacts” and ST3 “Monsoon variability and ecosystem response”. The Mahe Plateau is subject to excessive fishing pressure, a stressor affecting the breeding capacity of the stocks. We also suspect that changes may have occurred in the ecosystem (including pH and pollution by microplastics) and a research cruise made in 1980 will serve as a reference. ST1 focuses on the threats faced by marine ecosystems by the combination of multiple stressors. MAPS will address such issues, in line with the ST1 core questions: impacts of human-induced changes on biogeochemistry, ecology and human populations (in this case through the artisanal fishery).

Seychelles is under the influence of the monsoon. MAPS will take place during the Oct-Nov inter-monsoon, a transition period in the annual cycle, which also triggers the start of the spawning season for most of the demersal fish species. Investigating the link between the environmental conditions and this biological phase for stocks of economic importance in Seychelles relates to the 3rd core question of ST3: the effect of monsoonal conditions on ecosystem and fisheries.

5. INTERNATIONAL COLLABORATION(S):

Is the project part of a related multi-national activity? **YES : Seychelles and France**

If No, would you welcome international collaboration in your project? **n/a**

6. REGION(S) OF STUDY

Provide a description of ‘where’ the research is to be conducted (for field based activities) and/or the region or regions to which the research pertains (you are encouraged to consider providing either the coordinates of the area of studies or the coordinates of the planned cruise tracks, as well as a figure as an addendum to your proposal).

MAPS will take place on the Mahe Plateau (area: 42 000 km²), also known as the Seychelles Bank, where the granite islands of the archipelago are located. The average depth of the plateau is 65 m, ranging from 25 m along the edges to 75m in the deepest area inside the plateau.

6. TIMETABLE OF THE PROJECT

Start date: 1 st October 2021	End date: 30 November 2021
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IIOE-2 Joint Project Office (JPO)

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7. LINKAGES WITH OTHER PROJECTS / PROGRAMMES / INITIATIVES

Is the project part of a related national or multi-national activity? **YES**

If yes, provide the related activity title and website for reference, if available:

The SWIOFish3 programme, funded by the World Bank (2018 to 2024) to assist Seychelles in developing its Blue Economy Roadmap, would provide a partial financial support to MAPS.

Is your project part of, or affiliated to, another SCOR, IOC or IOGOOS activity or project?

If “yes”, please indicate which activity or project:

No

8. DATA MANAGEMENT AND SHARING

1. Will new data be collected as part of this project (yes or no)?

Yes, in particular all physical, biogeochemical data (incl. carbonate system parameters) and biological data (fluorescence, zooplankton, movements of fish by tagging).
The shelf waters of the Seychelles archipelago have been poorly sampled. Multidisciplinary cruises in shallow ecosystems were only performed in 1979-1980 (French expeditions) and intermittently during 1998-2001 with the Shoals of Capricorn (UK).

2. Contact information if any, of the person in charge of the data management from whom the metadata can be accessed by interested IIOE-2 stakeholders.

Please note that for all IIOE-2-endorsed projects, IIOE-2 will have developed its own metadata portal. Once the project is endorsed, the project leader will be asked to provide the metadata information of the project.

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3. Recognizing the need for an initial period of exclusive data use, would you be willing to provide timely access to all data generated under this project and associated metadata in accordance with relevant national and funding agency data sharing policies? **YES**

9. FUNDING

Please note that IIOE-2 strongly encourages funded/resourced projects. However, IIOE-2 may endorse projects yet to receive funding/resourcing if IIOE-2 endorsement can be clearly shown to significantly aid in prospects for funding/resourcing.

Has funding and resources to successfully achieve and undertake the project been obtained? Indicate the sources of funding and resources that have been approached and/or secured.

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The provision (and running costs) of the research vessel, by far the most expensive component of the project, will be paid by France. The other expenses (travel costs for participants, shipment of scientific equipment, consumables and analyses) will be partly covered by the SWIOFish3 programme. Supplementary funding sources for the benthic biodiversity surveys need to be sought.

10. BENEFITS FROM IIOE-2 ENDORSEMENT (1/4 page maximum)

Specify why you are seeking endorsement and how the activity would benefit from endorsement, and how the IIOE-2 SC could assist in the implementation of your project.

The first benefit will be to increase the international visibility of the cruise. The French engagement in oceanic research in the Indian Ocean is already well recognised. For instance, IRD (Institut de Recherche pour le Développement) has been collaborating directly with several countries of the West Indian Ocean by posting researchers in national institutions (India, Seychelles, Mauritius, Madagascar, South Africa). Many cruises undertaken with French research vessels took place in a wide range of latitude and ecosystems, from the Arabian Sea to the Sub-Antarctic domain, in line with national and international projects. IIOE-2 will therefore place MAPS within this international context.

The second benefit will be to attract collaborations among the IIOE-2 community in the post-cruise analyses which encompass several disciplines. There will be a great potential for comparison between the Seychelles and other archipelagos and coastal ecosystems

Finally, the IIOE-2 label may facilitate the access to supplementary funding which is necessary to wrap up some aspects of the project.

11. OPTIONAL: OTHER COMMENTS/INFORMATION/MATERIAL (length and detail may be at the discretion of and as deemed necessary by the applicant)

Please feel free to provide any other comments, information or materials that you feel relevant to your proposal for the IIOE-2 Steering Committee's information and benefit. You may provide this as general information or provide the additional comments/information/materials as relevant to any of the specific Sections above.

n/a

(Signature of the PI)

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