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## EIO - Environnement insulaire océanien

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on research unit:

Écosystèmes Insulaires Océaniques

EIO

Under the supervision of the following  
institutions and research bodies:

Université de la Polynésie Française

Institut Français de Recherche pour l'Exploitation de la  
Mer - IFREMER

Institut de Recherche pour le Développement - IRD

Institut Louis Malardé

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

*In the name of HCERES,<sup>1</sup>*

Michel COSNARD, president

*In the name of the experts committee,<sup>2</sup>*

James CLOERN, chairman of the committee

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Under the decree N<sup>o</sup>.2014-1365 dated 14 november 2014,

<sup>1</sup> The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

<sup>2</sup> The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

## Evaluation report

This report is the sole result of evaluation by the expert committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial reviewing by the committee.

**Unit name:** Écosystèmes Insulaires Océaniens

**Unit acronym:** EIO

**Label requested:** UMR

**Current number:** UMR 241

**Name of Director (2015-2016):** Ms Nabila GAERTNER-MAZOUNI

**Name of Project Leader (2017-2021):** Ms Nabila GAERTNER-MAZOUNI

## Expert committee members

**Chair:** Mr James CLOERN, United States Geological Survey, USA

**Experts:** Mr Jean-François AGNÈSE, IRD (representative of the CSS IRD)

Mr Nicolas FABRE, Université de Toulouse 3

Mr Mohamed LAABIR, Université de Montpellier

Mr Guillaume MITTA, Université de Perpignan Via Domitia (representative of the CNU)

**Scientific delegate representing the HCERES:**

Mr Steven BALL

Mr Gabriele SORCI

**Representatives of supervising institutions and bodies:**

Ms Chantal CAHU, IFREMER

Mr Éric CONTE, Université de Polynésie Française

Mr Frédéric MENARD, IRD

Mr Pascal RAMOUNET, ILM

**Head of Doctoral School:**

Mr Alban GABILLON, Doctoral School n° 469 « École Doctorale du Pacifique »

## 1 • Introduction

### History and geographical location of the unit

The Joint Research Unit “Écosystèmes Insulaires Océaniques”(UMR-EIO) has been created in 2012 as a response to the need to have a better structuring of the research activity on insular ecosystems in French Polynesia. The unit has, at the moment, about 70 members from four Academic Institutions [Université de Polynésie Française (UPF), Institut Français de Recherche pour l’exploitation de la Mer (IFREMER), Institut de Recherche pour le développement (IRD), Institut Louis Malardé (ILM)]. While all unit members are located in French Polynesia, they are nevertheless spread over four different sites (60 km between the most distant sites): University Campus, IRD, ILM, Centre IFREMER du Pacifique.

### Management team

Head: Ms Nabila GAERTNER-MAZOUNI

Deputy head: Mr Benoit BELIAEFF

### HCERES nomenclature

Principal: SVE2\_LS8 Évolution, écologie, biologie des populations

Secondaire: SVE1\_LS2 Génétique, génomique, bioinformatique

SVE1\_LS1 Biologie moléculaire et structurale, biochimie

SVE1\_LS7 Épidémiologie, santé publique, recherche clinique, technologies biomédicales

### Scientific domains

The unit has four main scientific aims:

- 1) understanding the functioning and evolution of oceanic insular ecosystems;
- 2) identify natural compounds of interest as to improve the sustainability of natural resources in Polynesia;
- 3) identify risk factors for oceanic insular ecosystems;
- 4) monitoring of the biodiversity of oceanic insular ecosystems.

## Unit workforce

Unit workforce	Number on 30/06/2015	Number on 01/01/2017
N1: Permanent professors and similar positions	13	12
N2: Permanent researchers from Institutions and similar positions	16	14
N3: Other permanent staff (technicians and administrative personnel)	21	16
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers from Institutions (Emeritus Research Director, Postdoctoral students, visitors, etc.)	11	
N6: Other contractual staff (technicians and administrative personnel)	10	
N7: PhD students	12	
<b>TOTAL N1 to N7</b>	<b>83</b>	
Qualified research supervisors (HDR) or similar positions	10	

Unit record	From 01/01/2010 to 30/06/2015
PhD theses defended	7
Postdoctoral scientists having spent at least 12 months in the unit	3
Number of Research Supervisor Qualifications (HDR) obtained during the period	2

## 2 • Overall assessment of the unit

### Introduction

The UMR-EIO plays a central role in French Polynesia to advance fundamental knowledge of coastal ecosystems in the under-studied subtropical regions of the world oceans, the services they provide to benefit human welfare, and the risks they face. The assemblage of 4 research institutions into a UMR in 2012 was an innovative step to address an urgent need for a coordinated scientific program to build the knowledge base required to anticipate, understand, and adapt to changes that will come from anthropogenic pressures and global climate change. UMR-EIO is a consortium between four research institutions (UPF, IFREMER, IRD, ILM) comprising 70 researchers, teachers, engineers and postgraduate students. Its purpose is to direct coordinated research around four themes: (1) functioning of insular oceanic ecosystems exploited by humans, (2) potential human uses of natural substances unique to Polynesia, (3) risks to sustainability of these ecosystems and the services they provide, (4) measurement and sustainability of Polynesia's oceanic biodiversity. These themes provided the foundation of a strategic plan that was absent when the last evaluation was done in September 2011, and they represent progress as this still-young UMR continues to evolve.

## Global assessment of the unit

Researchers of UMR-EIO are conducting studies of both regional and global significance, attacking fundamental and applied science problems targeted to Polynesia's oceanic ecosystems. In the context of its setting, the overall research quality of this UMR is good and for some aspects very good to excellent. Each of the four teams has worked to establish collaborations across an array of partners including other research institutions, decision-makers, and commercial enterprises, many of which provide funding support through contracts. The research of UMR-EIO scientists is recognized and highly valued at the local and regional scales, but recognition could be strengthened at the international scale through new collaborations and further engagement beyond the South Western Pacific. A notable achievement was establishment of a new master 2 program, reflecting a commitment to postgraduate education. However, student support and training vary across teams and could be stronger through greater effort to fund, recruit and train doctorates and post-doctorates. Researchers have worked collaboratively to develop a sound science plan for the next five years.

## Strengths and opportunities in the context

Unit members recognize and are exploiting the exceptional opportunities within French Polynesia to advance marine science and its relevance to people in the under-studied subtropical ecosystems of the southern hemisphere.

The research conducted within the unit is strongly tied to Polynesian societal demands, such as the management of Ciguatera risk, sustainability of pearl oyster farming, biodiversity conservation, and commercial development of natural resources grounded in traditional knowledge. This implies close connections to local stakeholders, including decision makers, and a high level of success at supporting science through contracts.

Members of the unit established the first master 2 program in natural sciences at UPF, and the UMR has opportunities to broaden its training of masters and PhD students and post-docs through research.

The unit project has given considerable effort and thought into a new science strategy organized around three themes to promote new collaborations, build cohesiveness and encourage synergistic work.

## Weaknesses and threats in the context

The unit lacks a well-defined scientific animation that largely comes from the personal skills of team and theme leaders. Students and scientific staff are eager to have more opportunities for engagement within and beyond the UMR through, e.g., scientific meetings shared with other research groups in Tahiti and Moorea.

Potential threats, recognized by UMR leaders, include distribution of the research unit across four localities, geographic isolation, and turnover of researchers in the non-university agencies. Minimizing these threats requires innovative leadership toward adaptation (rather than acceptance of these threats). Other threats to research progress are limitations in access to modern instruments (e.g. for chemical analyses) and computing resources (e.g. a cluster for analyzing big data sets).

UMR members are not pro-actively reaching out as much as they could to interact with other national and international programs of marine science in the region, such as the US Long Term Ecosystem Research Program in Moorea (<http://mcr.lternet.edu>).

The EIO website is outdated, incomplete, has errors, misses the opportunity to communicate the excitement and importance of research conducted in French Polynesian coastal ecosystems, and it does not communicate a sense of welcoming and opportunities to students. It does not indicate that data collected by EIO teams are publicly available, suggesting that they are not.

## Recommendations

The unit should develop a strategy for adapting to staff turnover through, e.g., annual assessments of expected staff changes to allow buffering the possible negative impact of departures on the unit research activities.

The unit should develop a plan to improve the scientific animation by, e.g., funding some science along new directions, organizing meetings of the entire unit staff dedicated to scientific exchanges on PhD/post-doctoral programs and transversal projects funded by specific budgets. This will promote interactions, develop a sense of belonging by all, and contribute to building a strong team.

The unit should contemplate a strategy to have a better positioning, aimed at attaining complementarity with respect to the other research units located in French Polynesia. For example, it could exploit opportunities for students to interact with visiting scientists working in the region who could give lectures, serve on thesis advisory committees, launch collaborations, discuss opportunities for post-docs, etc.

UMR scientists should recognize that some of their work merits publication in higher profile journals, so they should develop a practice of aiming higher.

A substantial effort is required to modernize and energize the EIO website. Consider adding a section that makes observational data and metadata available from the website (e.g. data that will come from rTHOT).

The unit should improve the recruitment of PhDs and post-docs.

Research devoted to fish and shrimp farming could be better structured and exploited.

The integrative approach could still be improved by developing population and functional genomic tools.

A new additional axis is the study of chemical contaminants (organic and inorganic) in marine food webs and related population eco-health. This is an interesting and complementary topic and many scientific questions could be raised concerning the effect of these pollutants on toxic algae, pathogenic bacteria and marine organisms. Identifying biotic and abiotic factors determining *Gambierdiscus* blooms in Polynesia faced to global change will be an interesting research question to be addressed in the near future by developing intra-UMR and regional collaborations.

The unit should encourage and reward high-productivity, high-impact, members and call on them as leaders to strengthen the overall productivity, international stature and impact of the unit research.

The unit should devote a bit more time to engage the public, including local schools and local politicians to teach them about the exciting marine science conducted by EIO members.