

FINAL RESUME ON THE RESEARCH UNIT
BEEP - Biology and Ecology of Deep Sea Ecosystems

UNDER THE SUPERVISION OF THE
FOLLOWING INSTITUTIONS AND RESEARCH
BODIES:

Université de Bretagne Occidentale - UBO

Institut français de recherche pour l'exploitation de la
mer - IFREMER

Centre National de la Recherche Scientifique - CNRS

EVALUATION CAMPAIGN 2020-2021
GROUP B



In the name of Hcéres¹:

Mr Thierry Coulhon, President

In the name of the experts committee²:

Mr Eric Pelletier, Chairman of the committee

Under the decree No.2014-1365 dated 14 November 2014,

¹ The president of Hcéres "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5);

² The evaluation reports "are signed by the chairman of the experts committee". (Article 11, paragraph 2).

Tables in this document were filled with certified data submitted by the supervising body on behalf of the unit.

UNIT PRESENTATION

Unit name:

Biology and Ecology of Deep Sea Ecosystems

Unit acronym:

BEEP

Current label and N°:

UMR 6197 LM2E and LEP

Application type:

Fusion, restructuring

Head of the unit (2020-2021):

Mr Mohamed Jebbar (LM2E) / Ms Daniela Zeppilli (LEP)

Project leader (2021-2025):

Mr Pierre-Marie Sarradin

Number of teams and/or themes:

4

EXPERTS COMMITTEE MEMBERS

Chair:

Mr Eric Pelletier, CEA, Evry

Experts:

Mr François Lallier, Sorbonne Université, Roscoff

Ms Valérie Michotey, Université d'Aix-Marseille (representative of CNU)

Ms Sylvie Rebuffat, Muséum national d'Histoire naturelle, MNHN, Paris
(representative of CS IFREMER)

Mr Benjamin Rey, Université de Lyon / CNRS (supporting personnel)

HCÉRES REPRESENTATIVE

Mr Pascal Simonet

REPRESENTATIVES OF SUPERVISING INSTITUTIONS AND BODIES

Mr Christian Brosseau, Université Bretagne Occidentale

Mr Philippe Goulletquer, IFREMER

Mr Gilles Pinay, INEE, CNRS

The BEEP unit project proposes a multidisciplinary approach of the biology and ecology of deep-sea ecosystems. Three scientific themes cover i) the biodiversity of deep ecosystems (schematically : exploring and sampling *in situ*), ii) the interactions in the deep sea (*ex situ* studies) and iii) the responses and adaptation of organisms (focus on molecular mechanisms). A fourth transverse action associated with the three themes covers the needed methodological and technological developments. These themes, by considering both microbial and faunal compartments of the environments, appear as the natural continuation of the knowledge, expertises and « savoir-faire » of the previously collaborating LM2E and LEP structures.

Fusion of the two existing structures (LM2E and LEP) should increase the potential of the BEEP unit for studying deep-sea and its extreme environments along a complete trajectory from exploration to molecular mechanisms, and including animal/bacterial models and cell levels.

LM2E - INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

The LM2E (Extreme Environments Microbiology Laboratory) unit (UMR 6197) created in 2004 from merging the Ifremer Laboratory of Microbiology and Biotechnology of Extremophiles (MBE) and the team « Diversity and Adaptation » is under the joint supervision of the University of West Brittany (UBO), the CNRS and Ifremer. It is located on two adjacent sites in Brest, the Ifremer Center and the European University Institute for Marine studies (Institut Universitaire Européen de la Mer, IUEM) at UBO. The LM2E is a plural-themed single team comprising 44 permanent members (including fifteen researchers or lecturers-researchers). The laboratories are located in two closely located buildings within the Technopôle Brest Iroise, in Brest.

RESEARCH ECOSYSTEM

The LM2E is devoted to the study of the microbiology of deep-sea ecosystems from molecules up to microbial communities and to their biotic-abiotic relationships.

LM2E covers the exploration and sampling of deep-sea environments via manned and unmanned means to study their microbial organisms and communities, the enrichment, isolation and cultivation of some of these organisms, the deciphering of the molecules and pathways involved in the communication between organisms, the study of their biotic and abiotic interactions and the exploration of their specific adaptive processes. It also tackles the identification of new sources of molecules of biotechnological interest, such as antimicrobial peptides or quorum sensing molecules.

LM2E has a rich portfolio of well-established ongoing collaborations and is connected with various research structures devoted to marine studies, from the local to the international level. At local and regional levels : Brest IUEM (OSU) and Ifremer transdisciplinary structures ; at national level : CNRS DIPEE network structure, Institut Carnot-Ifremer EDROME, GDR Archaea and LabEx MER (co-funders and coordinators) / EUR (École Universitaire de Recherche) IsBlue, and at the European and international levels : the Sino-French associate laboratory MicrobSea.

The LM2E unit is also involved in the socio-economics outreach of the Brittany area.

HCÉRES NOMENCLATURE AND THEMATICS OF THE UNIT

It relates to the HCERES axis SVE1 (SVE1_2), SVE2 (SVE2_1 and SVE2_2) and ST4.

MANAGEMENT TEAM

Mr Mohamed Jebbar (DU), Mr Didier Flament (DA)

UNIT WORKFORCE

Name of the unit: LM2E

Active staff	Number 06/01/2020	Number 01/01/2022
Full professors and similar positions	1	
Assistant professors and similar positions	5	
Full time research directors (Directeurs de recherche) and similar positions	0	

Full time research associates (Chargés de recherche) and similar positions	1	
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	8	
High school teachers	0	
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	15	
Permanent staff	30	
Non-permanent professors and associate professors, including emeritus		
Non-permanent full time scientists, including emeritus, post-docs (except PhD students)	2	
PhD Students	12	
Non-permanent supporting personnel		
Non-permanent staff	14	
Total	44	

LM2E - GLOBAL ASSESSMENT OF THE UNIT

The LM2E (Extreme Environments Microbiology Laboratory) research unit, structured in three themes, is devoted to the study of the microbiology of deep-sea ecosystems from molecules up to microbial communities and to their biotic-abiotic relationships. Its activities cover the exploration and sampling of deep-sea environments via manned and unmanned means to study their microbial organisms and communities, the enrichment, isolation and cultivation of some of these organisms, the deciphering of the molecules and pathways involved in the communication between organisms, the study of their biotic and abiotic interactions and the exploration of their specific adaptive processes. It also tackles the identification of new sources of molecules of biotechnological interest, such as antimicrobial peptides or quorum sensing molecules.

It is, among other structures, part of the Brest IUEM (OSU), of the LabEx MER / EUR IsBlue, and member of the Sino-French associate laboratory MicrobSea.

The overall scientific output of the LM2E, both quantitatively and qualitatively, is rated as very good to excellent, despite a low return on investment for their involvement in oceanographic campaign organisation. The international and national notoriety and recognition as assessed by academic contracts, invitations and organization of congresses are excellent. The research activity is supported by a broad portfolio of fundings, from the local to the international level. Training through research is rated as excellent.

The unit showed an excellent commitment in teaching and training of students as well as for its diverse outreach set of activities.

Overall, the unit's life organisation is considered very good with a large part of the items pertaining to the management organisation, parity, health and safety, environmental impact and intellectual property, being satisfied.

Globally, despite a very good to excellent overall scientific output, the unit LM2E was evaluated excellent with very good to excellent outputs for the « Exploration and understanding of the functioning of deep extreme » and the « Characterization and activities of microbial actors in these ecosystems » themes and excellent outputs for the « Adaptive processes », in particular due to their strong commitment in scientific oceanographic cruises and production of multiple prototypes for measurements and sampling in deep oceans.

LEP - INTRODUCTION

HISTORY AND GEOGRAPHICAL LOCATION OF THE UNIT

Ifremer LEP (Laboratory of Deep Environments) is located on the Ifremer campus within the Technopôle Brest Iroise, in Brest. It is integrated in the EEP (Étude des Écosystèmes Profonds) Ifremer research unit together with the LM2E within the REM department (Ressources Physiques et Écosystèmes du fond de Mer), as for the previous AERES evaluation in 2012.

RESEARCH ECOSYSTEM

The LEP is an Ifremer laboratory, which has strong collaborations at the local (with other Ifremer laboratories and UBO groups), national (via the Connect national workshop, MNHN, Universities of Lille, Toulouse, Sorbonne Université, IPGP) and international levels (European and non-European collaborations).

HCÉRES NOMENCLATURE AND THEMATICS OF THE UNIT

The LEP activities relate to the HCERES axis SVE1 (SVE1_2).

MANAGEMENT TEAM

Ms Daniela Zeppilli (2017-2020), Ms Jozée Sarrazin (2015-2017)

UNIT WORKFORCE

Name of the unit: LEP

Active staff	Number 06/01/2020	Number 01/01/2022
Full professors and similar positions	0	
Assistant professors and similar positions	0	
Full time research directors (Directeurs de recherche) and similar positions	0	
Full time research associates (Chargés de recherche) and similar positions	0	
Other scientists ("Conservateurs, cadres scientifiques des EPIC, fondations, industries, etc.")	9	
High school teachers	0	
Supporting personnel (ITAs, BIATSSs and others, notably of EPICs)	12	
Permanent staff	21	
Non-permanent professors and associate professors, including emeritus	0	
Non-permanent full time scientists, including emeritus, post-docs (except PhD students)	4	
PhD Students	7	
Non-permanent supporting personnel	6	
Non-permanent staff	17	
Total	38	

LEP - GLOBAL ASSESSMENT OF THE UNIT

Ifremer LEP (Laboratory of Deep Environments) is an Ifremer laboratory located on the Ifremer campus within the Technopôle Brest Iroise, in Brest.

The LEP focuses exclusively on the ecology of deep-sea ecosystems, essentially on the faunal components. It aims at understanding their structure, functioning, dynamics and temporal variability. Part of the activities are at the interface between ecosystems and mining exploration. The LEP is also developing, in a complementary fashion, new approaches and new tools for investigating deep-sea ecosystems. The activities combine the management of oceanographic campaigns for deep-sea exploration and sampling, taxonomical, analytical and laboratory studies.

Studies focus on chemosynthetic and other deep-sea ecosystems (cold seeps, deep-sea canyons, hydrothermal vents, polymetallic nodules, deep-sea corals), considering megafauna, macrofauna, meiofauna, their assemblages and symbiotic associations. They involve a wide range of disciplines including ecology, genetics, chemistry and instrumentation, and are organized along three main lines : i) Structure and functioning of deep-sea ecosystems, ii) Temporal variability, rhythms and life cycles of deep-sea communities, and iii) Deep-sea ecosystems facing anthropogenic pressures.

The scientific production, supported by a strong network of national collaborations and an important number of foreign scientists is excellent, but despite the organization of oceanographic campaigns, the international notoriety is only very good to excellent.

Public outreach is considered excellent to outstanding. The quality of the science produced by the unit and the development of instrumentation are excellent, but the interaction with the non-academic world and impact on the economy is fair. Openness to the society is outstanding.

LEP is excellent in training PhDs and postdoctoral fellows through research even though the number of HDRs needs to be increased.

Globally, the LEP unit was evaluated as excellent.

The evaluation reports of Hceres
are available online: www.hceres.com

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