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## **B2IF - Biogéochimie des Écosystèmes Forestiers**

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Department of Research Evaluation

report on research unit:

Biogéochimie Inventaire et Indicateurs du  
fonctionnement des écosystèmes Forestiers  
B2IF

under the supervision of  
the following institutions  
and research bodies:

Institut National de la Recherche Agronomique - INRA  
Institut National de l'information Géographique et  
Forestière - IGN

Evaluation Campaign 2016-2017 (Group C)

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Department of Research Evaluation

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

Michel Cosnard, president

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

Jürgen Bausch, chairman of the committee

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Under the decree No.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:** Biogéochimie Inventaire et Indicateurs du fonctionnement des écosystèmes Forestiers

**Unit acronym:** B2IF

**Label requested:**

**Current number:**

**Name of Director (2016-2017):** Mr Jean-Christophe HERVÉ (LIF)  
Mr Laurent SAINT-ANDRÉ (BEF)

**Name of Project Leader (2018-2022):** Mr Laurent SAINT-ANDRÉ

## Expert committee members

**Chair:** Mr Jürgen BAUHS, University of Freiburg, Germany

**Experts:** Mr Frank HAGEDORN, Swiss Federal Institute for Forest, Snow and Landscape Research, Switzerland  
Ms Pascale LOUVAT, Institut de Physique du Globe de Paris (representative of supporting personnel)  
Mr Philippe NORMAND, Claude Bernard University Lyon 1 (representative of the INRA, CSS, STEA)  
Mr Bernard THIBAUT, CNRS, Montpellier

**Scientific delegate representing the HCERES:**  
Mr Serge DELROT

**Representative of supervising institutions and bodies:**  
Mr Thierry CAQUET, EFPA INRA Division  
Mr Nicolas PAPANODITIS, IGN

**Head of Doctoral School:** Mr Stéphane DESOBRY, Doctoral School n° 410, "Science and Engineering-Resources Process Products Environment"

## 1 • Introduction

### History and geographical location of the unit

The structure proposed for the next contract carries the name B2IF. It results from the merger between the two former units BEF (Biogeochemistry of Forest Ecosystems) and LIF (Forest Inventory Laboratory).

The former BEF unit is part of the INRA EFPA division and is based at INRA's Nancy-Lorraine centre at Champenoux. It originated from the Research Station for Soils, Microbiology and Nutrition of forest trees (created in 1984), which was subsequently split (in 1993) into two parts:

- 1) the Microbiology and Biogeochemistry of Forest Ecosystems unit;
- 2) the Nutrition team, attached to the Plant Ecophysiology unit.

In 2001, when the UMRs were set up, the Microbiology and Biogeochemistry of Forest Ecosystems unit was in turn split into two parts, the UMR Interaction of Trees with Microorganisms (IaM) and the INRA Biogeochemistry of Forest Ecosystems (BEF) Research unit, now headed by Mr Laurent SAINT-ANDRÉ.

The Forest Inventory Laboratory (LIF) was created by the French National Institute of Geographic and Forest Information (IGN), further to the merger of the IGN with the "Inventaire Forestier National" (National Forest Inventory) in 2012, and is led by Mr Jean-Christophe HERVÉ since the beginning. Over the last 4 years, research staff has been recruited (now 4 researchers), a cooperation agreement was signed between INRA, AgroParisTech, and the IGN (2014) and the team was located in the AgroParisTech Centre in Nancy. Since 2015, LIF is also a participant in the ARBRE LabEx.

For the forthcoming five-year term, the two former units BEF and LIF propose to merge under the direction of Mr Laurent SAINT-ANDRÉ.

### Management team

Director: Mr Laurent SAINT-ANDRÉ

Deputy director: Mr Jean-Christophe HERVÉ

### HCERES nomenclature

ST3 Sciences de la terre et de l'univers

### Scientific domains

BEF develops knowledge and expertise in quantitative and functional ecology applied to forest ecosystems and forest inventory. In disciplinary terms, it operates in the areas of soil science, biogeochemistry and forest sciences and at the interfaces between these disciplines.

Unit workforce (BEF)

Unit workforce	Number on 30/06/2016 BEF+LIF	Number on 01/01/2018 B2IF
N1: Permanent professors and similar positions		
N2: Permanent researchers from Institutions and similar positions	13	16
N3: Other permanent staff (technicians and administrative personnel)	10.6	10.6
N4: Other researchers (Postdoctoral students, visitors, etc.)	3	
N5: Emeritus		
N6: Other contractual staff (technicians and administrative personnel)	7	
N7: PhD students and postdocs	6	
<b>TOTAL N1 to N7</b>	<b>39.6</b>	
Qualified research supervisors (HDR) or similar positions	9	

Unit record	From 01/01/2011 to 30/06/2016
PhD theses defended	19
Postdoctoral scientists having spent at least 12 months in the unit	2
Number of Research Supervisor Qualifications (HDR) obtained during the period	3

## 2 • Assessment of the unit

### Global assessment of the unit

This global assessment concerns both the Biogeochemistry of Forest Ecosystems (BEF) unit and the Forest Inventory Laboratory (LIF). Both BEF and LIF, merging to form the new structure, occupy unique niches in the forest research landscape in France.

There is no other research group like the former BEF with this unique focus on the biogeochemistry of forest ecosystems. The unit has an excellent international reputation built on a strategic research direction, solid research infrastructure, and scientific output. It has continued its positive development during the previous period. The main research theme on the bioavailability of mineral elements in forest ecosystems is well suited to focus the different research activities (concepts of bioavailability, biotic and abiotic controls of bioavailability, ecosystem responses to different levels of bioavailability, and indicators of ecosystem functioning) and to link these to current topical issues such as sustainable forest management in the face of global change and a need for intensification of forest use. Over the last four years, the unit has implemented a range of new methods, such as long-term tracing of Ca- and Mg-isotopes in the field, that have helped to progress the understanding of biogeochemical cycles and their interactions with microbial communities. An important asset of the unit is the long-term field sites/experiments. The unit has considerably improved its already excellent publication record, chiefly through targeting high-ranking journals such as *Scientific Reports* or *Biological Reviews*, in addition to publishing in the top disciplinary journals such as *Forest Ecology and Management*, *Plant and Soil*, *Biogeosciences*, *Biogeochemistry*, or *Microbial Ecology*. The number of publications in journals with impact factors higher than 3 has more than doubled when compared to the previous period.

The LIF, considerably smaller than BEF, is a much more recent structure and its past performance is thus difficult to evaluate. LIF develops an enhanced, multipurpose, multi-source and multi-scale national forest inventory in France through:

- a) statistical optimization of the inventory system;
- b) improving the precision of NFI results on a sub-regional scale;
- c) providing enhanced information outputs to address intensification of forest resources use, carbon storage, and impacts of climate change.

The future success of LIF will depend on its ability to secure external funding to carry out research projects, its strategy to recruit PhD students and postdocs, and to develop an international scientific reputation. The success in participating in a highly relevant and important Horizon 2020 project (DIABOLO) represents a critical step in that direction.

Both BEF and LIF follow fundamental and applied research directions and have strong networks with non-academic institutions and practical fields in forestry and soil management. They maintain a high level of outreach activities to inform and support stakeholders.

There are many valid scientific and strategic reasons for the merger of BEF and LIF. While BEF would benefit from extrapolation of their findings to larger scales, LIF would clearly profit from an improved mechanistic understanding in their estimates at a regional and national scale.