

How the French Scientific Community deals with Biodiversity & Climate change issues

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The Scientific Challenge

- For life scientists the question is: are we facing a Human activity related 6th extinction event and what will be its consequences on ecosystem functioning and fate.
- For scientists and stakeholders involved in resource use and management the question is: How deeply climate and biodiversity changes will affect the availability and sustainability of all kind of terrestrial and marine ecosystem services used by human communities.
- For Human, animal or plant health scientists and officers the question is: how climate and biodiversity changes will bring back new diseases, or new pests or vectors.

The Scientific Challenge

- Huge and increasing amount of **data and publications** on biodiversity and climate change, but...
 - Need of **synthesis analyses** of available data to identify **knowledge gaps** and to help identifying **problems related to data sharing and data comparisons**.
 - Lack of **relevant long term data** on the respective and synergistic role of the different **pressure factors** (including human policy responses to environmental changes) on marine and terrestrial biodiversity dynamics and ecosystem functioning.
 - Need of a better understanding of **the complex and non linear relationships between biodiversity, ecosystem functioning and ecosystem services** in its broader sense (services and... disservices).

FRB, The French Foundation for Research on Biodiversity

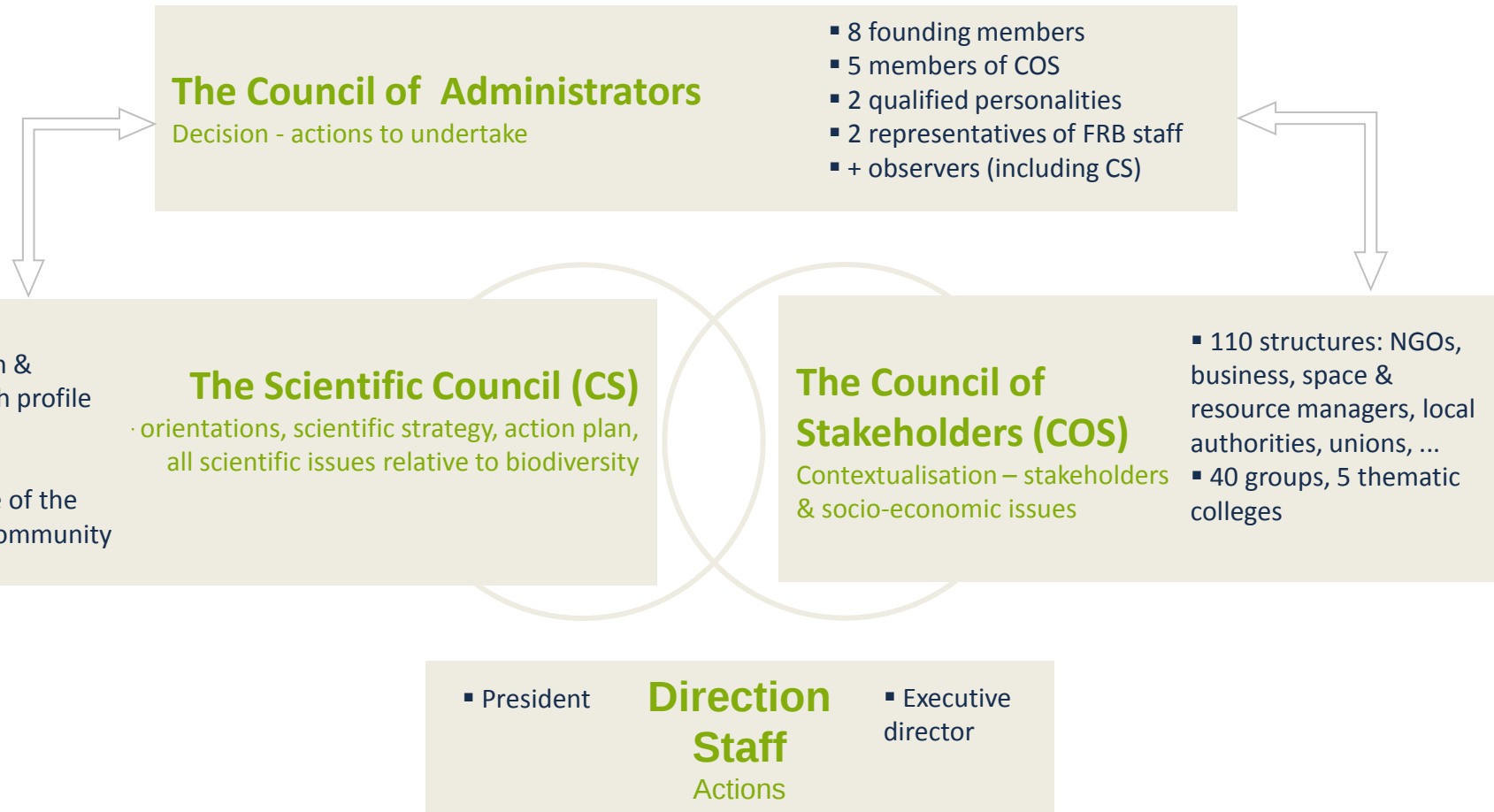
A science-society interface to tackle scientific challenges of biodiversity



<http://www.fondationbiodiversite.fr>



FRB GOVERNANCE



FRB ACTIONS

- ✓ Mobilizing **scientific expertise** to support **decision & policy making** at national and global scales (national database, studies, **IPBES**, EFESSE – the French Assessment of Ecosystem and Ecosystem Services -)
- ✓ Stenghtening the **Science & Society dialogue** & disseminating **scientific knowledge** (CS, COS)
- ✓ Providing **orientations** and **co-construction of research** (CS, COS, AllEnvi – The French alliance of research institutes engaged in Environmental studies -)
- ✓ Fostering the development of **innovative research projects / analysis / synthesis** & making existing **metadata available** (Modelling & Scenarios Program, CESAB, ECOSCOPE)
- ✓ Fostering the development of **research programs on priority topics** (CS, COS, Programs)
- ✓ Developing **partnerships & sponsorships**

FLAGSHIPS PROGRAMS 1: MODELLING & SCENARIOS

Modelling & scenarios

- ✓ Aims: **To make models & scenarios of biodiversity evolution available to address major challenges in conservation & sustainable management of biodiversity and ecosystem services**
 - ✓ What is the future for the biodiversity & associated ecosystem services?
 - ✓ What kind of adaptation to changes in biodiversity are needed?
 - ✓ **To reinforce the French scientific community working on models and scenarios of biodiversity dynamics**
 - ✓ **To support local actors in the management of biodiversity**
 - ✓ **To support policy makers for a better integration of the biodiversity in human activities**
- ✓ Started in 2010 with calls for projects, workshop & networking, synthesis

The **BIO-THAW** project

Modelling **BIO**diversity in **Tropical High Andean Wetlands**



FLAGSHIPS PROGRAMS 2: ECOSCOPE



- ✓ **Network of French biodiversity research observatories**
- ✓ **Aims: To coordinate & reinforce the biodiversity research observatories to understand and anticipate changes in biodiversity and associated networks**
 - ✓ Enhancing the visibility of the observatories and access to data
 - ✓ Ensuring the cohesion between the different observation systems
 - ✓ Promoting scientific synergies between observatories
 - ✓ Contributing to national & international initiatives
- ✓ **3 components**
 - ✓ **Citoscope** – Citizens science, participatory monitoring
 - ✓ **Observatories focusing on ecosystems or by thematic**
 - ✓ **RGscope** – Genetic resources: Animals, Plants, Fungus, Microorganisms
- ✓ **Started in 2011 – SOERE/Research Infrastructures AllEnvi – BON**

ECOSCOPE

Landscape analysis
Metadata database
Information systems
Protocols
Research projects
(Organisms + CESAB)
SINP, ONB...
LifeWatch,
GEO.BON, GBIF,
FAO...

Biological data
Environmental data
Socio-economic data

From infra-specific
to ecosystem levels

FLAGSHIPS PROGRAMS 3: CESAB

- ✓ Center for Synthesis and Analysis on Biodiversity
- ✓ Aims: **To provide a set of tools (meeting points, human & technical resources) to get a better use of existing biodiversity data to foster research on biodiversity**
 - ✓ Advancing knowledge in the area of biodiversity
 - ✓ Developing a culture of synthesis and collaboration
 - ✓ Developing ideas and innovative concepts
 - ✓ Facilitating connections between all scientific fields and society actors
- ✓ Started in 2011 with approx. 1 call for projects/y.
 - ✓ In progress



CESAB

Only 2 countries with
comparables initiatives
- USA (NCEAS, NeScent)
- Australia (ACEAS)
Aix en Provence



Strong scientific links with other international synthesis centers (NCEAS, USA; ACEAS, Aus.; sDiv, Ger.; ...)

<http://cesab.org/index.php?lang=en>



CENTER FOR SYNTHESIS AND ANALYSIS OF BIODIVERSITY



A centre created and developed by the

Home ▶ Current Projects ▶ **BIODIS**

CONTACT

The
CESAB

PRESENTATION
ORGANISATION
LOCATION
PARTNERSHIPS
JOBS & INTERNSHIPS

Research

CALLS FOR PROPOSALS
CURRENT PROJECTS
PROJETS PASSÉS
RESEARCH AT CESAB'S
WORKING GROUPS

Resources

INFOS
SCIENTIFIC SEMINARS
RESULTS
PRESS-COMMUNICATION

BIODIS



Disentangling the Linkages between Biodiversity and Emerging Infectious Diseases

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Co-PIs: Benjamin Roche (IRD - UMMISCO, Paris) and James N. Mills (Emory University, Atlanta, USA)

Post-Doctor: Gabriel Ernesto García-Peña, National and Autonomous University of México (UNAM), Mexico

10 participants : Felicia Keesing, Bard College, Annandale, NY, USA; Parvize Hosseini, EcoHealth Alliance, NY, USA; James N. Mills, Emory University, Atlanta, GA, USA; Vanessa Ezenwa, University of Georgia, GA, USA; Simon Blanchet, CNRS-SEEM, Moulis, France; Michel Gauthier-Clerc, Fondation Sansuire, la Tour-du-Valat, France; Gwenaél Vour'ch, INRA, Clermont/Theix, France; Benjamin Roche, IRD, Paris, France; Annapaola Rizzoli, Centro di Ecologia Alpina, Trento, Italy; Gerardo Suzan, Universidad Nacional Autonoma de Mexico, Mexico City, Mexico; Anne-Hélène Prieur-Richard, Diversitas, Paris; Marco Vignuzzi, Institut Pasteur, Paris.

Abstract :

75% of emerging diseases are zoonotic. Intuitively, the greatest number of zoonotic pathogens should exist in areas with greatest biodiversity; nevertheless, emergence frequently is associated with biodiversity loss, often anthropogenic in origin. Several hypotheses have been proposed, including the dilution effect hypothesis and selection for opportunistic species. Yet, much of the science remains theoretical and data available are spread among unrelated groups of investigators. The best chance for understanding the relationships between biodiversity and infectious diseases lies in multi-institutional and multidisciplinary collaboration.

FLAGSHIPS PROGRAMS 4: BIODIVERSA



- ✓ **EU network of national funding agencies promoting pan-EU research for conservation and sustainable management of biodiversity**
- ✓ **Aims: To build a sustainable platform to support high-level biodiversity research on an international scale**
 - ✓ Creating synergies between European teams working on the same research topic (cross-border)
 - ✓ Promoting innovative research project in adequacy with societal issues
 - ✓ Ensuring a powerful financial lever
 - ✓ Disseminating & sharing best practices
- ✓ **Started in 2005 (Framework Program 6, n1) – 2007 (FP7, n2) – 2014 (H2020, n3) with approx. 1 joint call for projects + co-funds from EC/year**
 - ✓ **35 projects (pre)funded for 2010-2014 (40 M€)**

BiodivERsA

ERA-net
21 partners
17 countries

<http://www.biodiversa.org>

MOBILIZATION OF EXPERTISE: IPBES

- ✓ **IPBES: Intergovernmental Platform on Biodiversity & Ecosystem Services**
- ✓ **Aims: To provide a mechanism recognized by both the scientific and policy communities to synthesize, review, assess and critically evaluate relevant information and knowledge generated worldwide by governments, academia, scientific organizations, non-governmental organizations and indigenous communities.**
- ✓ **FRB:**
 - ✓ To provide a scientific support for French ministries during negotiations and IPBES plenary (Panama City, Bonn, Antalya)
 - ✓ To lead the Scientific secretariat of the IPBES' French committee
 - ✓ To promote the mobilization of French experts in the work program of IPBES
- ✓ Started in 2012 (preparatory – 2011)



Strategies and priorities for research on Biodiversity established by the FRB Scientific Council in partnership with the FRB Stakeholder Council

[The 2013 Strategy](#): Six main thematic axes have been discussed:

- 1. Biodiversity values & actors
- 2. Ecosystem functions & services
- 3. Pressures & risks
- 4. Information and Knowledge systems
- 5. Biodiversity and ecosystem responses and adaptation
- 6. Innovations & actions

Each axis report is structured according to the following entrances: to [document](#), to [understand](#) and to [model](#) and develop [scenarios](#).