

IndexMed is a response to a call for project from CNRS (MASTODONS). A consortium is relevant at this time due to the growing interest shown by the participants for multidisciplinary work and organization in order to identify and better understand issues of big data.

IndexMed consortium prepare research projects supported by participants according to their expertise.

We propose a questionnaire to people who attended the seminars or have expressed their interest in the following subjects :

- Decentralized information systems
- Quality of data - Indexing data
- Data mining
- Data visualization
- Processing and visualization tools
- Transposition
- Preservation of the data
- Machine learning and artificial intelligence

An online questionnaire is available in order to list IndexMed members (persons, research units, institutes, agencies, societies), that constitute the strength of this network.

**IndexMed** is a consortium created by the axis « Management of biodiversity and natural spaces » of the IMBE (Mediterranean Institute of Biodiversity and marine and terrestrial Ecology). Its main goal is to develop the knowledge of databases and their effective use in the ecological research community. This consortium responds to calls for projects using databases to address ecological issues in the Mediterranean basin, promoting multidisciplinary and collaboration with other entities of the CNRS, other research organisms and universities. The projects to be developed by IndexMed members must be based on various national and international initiatives and promote international collaboration. This consortium must link existing thematic networks and initiatives at national and international levels.

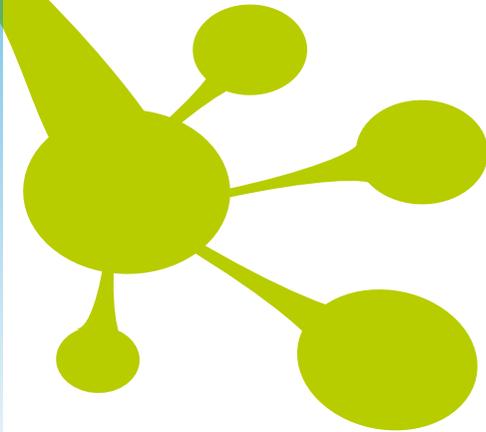
The **short-term goal of IndexMed** is to establish a platform of data indexing of Mediterranean biodiversity and of environmental parameters which are of interest for research. This index will use the tools and methods recommended at both the national (SINP, MNHN/GBIF, RBDD) and international levels (MedOBIS, OBIS, GBIF, LifeWatch, GEOBON, etc.). It will be based on catalogs developed at national and international levels (IDCNP of the SINP, networks of actors of the FRB).



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# IndexMed

*Interoperability  
of databases  
in ecology*



## Consortium



# Interoperability of databases in ecology

## IndexMed



Models and tools proposed will allow data from different disciplines to be combined and to propose methods of scenarios creation by successive approaches, based on concepts currently described in the field of global ecology

## Context

It is clear that the data used by scientists in the field of ecology are no longer entirely produced by scientific institutions, which instead rely on external networks of participants and skills. The development of citizen sciences leaves unanswered questions related to intellectual property and notions of responsibility with respect to this common heritage. The availability of these data is variable, and qualification processes that assess usability and efficiency are still rare. Conversely, production of scientific data is increasingly financed under the condition of accessibility (molecular biology data has been for decades, but for ecological and environmental data accessibility is only recently and rarely required). But the proper tools for this accessibility just don't exist...

## Improve interoperability between disciplines

### Objectives

The project will develop a resolution service that should value the results of ecological research by responding to current demands for social use. The resolution of these indexes Web service relies on the unique identifiers of databases, creates some where none exist, and also creates relationships between them where there is more than one. It is based on large panels of participants, data and skills being developed. The project should develop new transdisciplinary methods of data analysis, focusing on open data, open source and free methods and development tools.

### Method

Bi-, tri-, or trans-disciplinary approaches rely on "interoperable databases modules".

This concept requires that the participants not only develop their metadata, but that they also support data enrichment via common "ontologies". These qualifications allow for the creation of graphs of data from different disciplines and to search them based on common existing knowledge (Aix-Marseille University, University of Montpellier, CESAB, etc.)

### Architecture

The architecture of information systems for projects being developed must be decentralized and should consist of indexing, classifying, mapping, and interfacing of data from coastal and marine Mediterranean environments for research in ecology and management tools of natural spaces.

### A technical challenge faced by many communities

IndexMed seeks the cooperation of mathematicians, physicists, computer engineers, archivists, astronomers, economists, and sociologists in order to best adapt the tools they use and rely on their expertise.

### A scientific AND societal purpose

With an initial level of interoperability, the project will test the creation of "data cubes" by connecting for example, sociological, economic and ecological aspects of Mediterranean biodiversity. It will rely on the latest developments of IT and mathematics (algorithm graphs, data mining) to propose solutions to transdisciplinary issues that directly concern biodiversity.

- Development of nodal points of massive indexation and data classification of the coastal and marine Mediterranean environment.
- Development of configurable graphs to search in multidisciplinary data.

## Participants



This project was initiated as part of a response to the CNRS call of project MASTODONS (Large scientific datasets). Improved and completed, it will be proposed at the call of project as a "work package" of a larger project on biodiversity.