MARBEC-Obs: Towards a virtual observatory of marine and coastal ecosystems, mainly in Mediterranean and tropical areas

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the largest French research unit in **marine biodiversity** (IRD IFREMER CNRS and University of Montpellier)

with many **international partnerships**

~ 240 people
### 3 main objectives:

1. To describe marine biodiversity, understand its dynamics and the functioning of marine ecosystems
2. To analyze the impact of anthropogenic pressure on these ecosystems and develop responses scenarii to global change
3. To reconcile exploitation (especially fisheries and aquaculture), and conservation and respond to societal expectations (expertise, innovation, remediation)

### 8 scientific topics:

<table>
<thead>
<tr>
<th>Number</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>Evolutionary ecology and adaptation</td>
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<tr>
<td>2</td>
<td>Individuals, populations and habitats</td>
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<td>3</td>
<td>Communities’ dynamics and functioning</td>
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<td>4</td>
<td>Micro-organisms and interactions with macro-organisms</td>
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<tr>
<td>5</td>
<td>Contaminants, future and answers</td>
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<td>6</td>
<td>Sustainable aquacultures</td>
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<td>7</td>
<td>Coastal systems of multiple uses</td>
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<tr>
<td>8</td>
<td>Ecosystem approach to fisheries</td>
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</table>
MARBEC-Obs in charge of 21 long-term observatories

**Aims:** contributing to research and expertise on the state of coastal and marine ecosystems, biodiversity and the impact of human activities exploiting this biodiversity

**Geographical coverage**
Western mediterranean sea, Indien, Atlantic and pacific Oceans

~ 45 people involved
11 leaded by MARBEC & 10 with our participation

Focus on 

www.umr-marbec.fr/fr/poles/observatoires,576.html
Demersal resources (bottom): MEDITS (MEDITerranean Trawl Survey) - DCMAP-EU

Lead: A. Jadaud, L. Metral

Halieutic, Hydrology, Bony fish, elasmobranchs, cephalopods, crustaceans, contributes also to Marine Strategy Framework Directive,

- May-June, since 1994, 12 counterparts European countries
- International protocol (MEDITS group)
- Biodiversity at the bottom (+ megabenthos)
- Bottom trawling
- DCSMM: physics (CTD), zooplankton (WP2), PFB, macrowastes, stomach contents, isotopes, contaminants...

www.sibm.it/SITO%20MEDITS/principaleprogramme.htm
Observatory of Exploited Tropical Pelagic Ecosystems (Obs7)

Lead: P. Bach

Biological Information
Collection, Fisheries Informations, Tuna Fisheries,

www.ob7.ird.fr
ReefTEMPS : Network of temperature, pressure and salinity sensors in the coastal area of the South, West and South-West Pacific

Temperature, Conductivity, Salinity, Pressure, Waves, pH, Acidity, Fluorescence

Lead: Jérôme Aucan - Régis Hocdé

http://reeftemps.observatoire-gops.org
Monitoring of Mediterranean lagoons, ecological and chemical status (phytoplankton, nutrients, macrophytes, chemical contaminants),


Lead: Valérie Dérolez

Recovery

Summer state of the water column (nutrients)

2001-2006

2010-2015

www.ifremer.fr/surval2/...
We promote –to our team- the adoption and use of the best practices

Within FAIR guiding principles for scientific data management (Findable, Accessible, Interoperable and Re-usable)
Observation data management and access

- Provide access to data and products
  Provide a combined array of services and Functionalities: 
  *metadata exchange, visualisation of data, data acces, transformation of data...*

- Interoperable services (each tailored to a specific scientific user community):
  *SOS / Sensor ML (Sensor Observation Service), NetCDF services and others...*

- Management of the national fisheries information system (Obs7)

- Additional quality control. Storage in the information systems of all values (raw, validated) along the qualification process. Guaranteeing the quality of the measurements and the traceability of observations and analyzes.
Starting a national or european labeling process (for several observation networks)

Feeding the regional and international data centers and web data portals:
SeaDataNet/EDIOS, Seanoe/ODATIS data portal, IMOS, GBIF, EMODnet in a soon future for macrolitters in Mediterranean (MEDIT)

Identifying of the dataset archives (DOI)
ReefTemps: doi.org/10.17882/55128 Medits: dx.doi.org/10.18142/7 Pelmed: dx.doi.org/10.18142/19
The services and functionalities offered by the information systems combine modeling, statistical analysis, data management and data visualisation.

We also target to share and to interconnect some datasets, to optimize the exploitation of already acquired data by facilitating access, to allow comparisons between data of different origin and nature (observation data *versus* model results).

The results, including indicators and innovative products, are designed for Institutional stakeholders, Government Services, EU Water and Marine Strategy Framework Directives and scientific communities.

MARBEC-Obs also has developped a Tuna Fisheries Expertise and a wider expertise on marine and coastal ecosystems mainly in Mediterranean and tropical areas.
Automation of tasks with a simple & easy-to-use Workflow:

**Users:** CSVs to fill (via google doc => collaborative inputs): infrastructure metadata, dataset metadata

**Developers:** **R codes for easy handling** (on Github) (i.e. R packages created by a very good developer of the FAO (java, web)

**Data sources:** photos, semi-structured (CSV ..), SQL, NetCDF

**Reference standards for interoperability:** metadata, data and access protocols (OGC/INSPIRE, EML/GBIF...)

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**Diagram Description:**

1. **HETEROGENEOUS DATASET**
2. **DATABASE**
3. **THREDDS**
4. **XML METADATA**
5. **DATA VISION AND PROCESSING**
6. **DATA ACCESS**
7. **DATA DISCOVERY**
8. **GeoServer**
9. **GeoNode**

**End Users:** Accessible and reusable data through GeoServer and GeoNode.
MARBEC-Obs has now different components: from sensors, to data dissemination and interoperability, to data processing combining modeling.

MARBEC-Obs can evolve towards a virtual observatory of marine and coastal ecosystems, mainly in Mediterranean and tropical areas.
Thank you

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