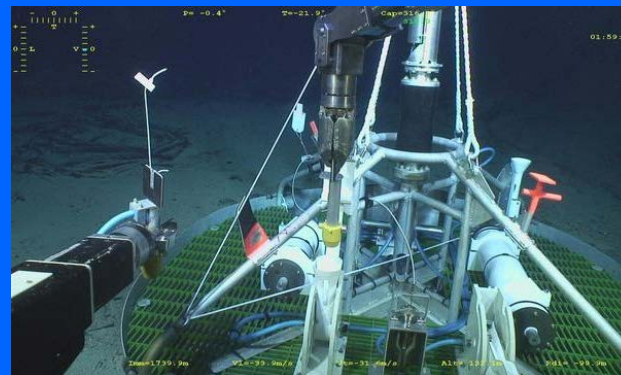


Wave circulation flume



Sea-floor station



Aquaculture research facility

Marine Research Infrastructures : overview, vision and recommendations

Jean-François Masset (IFREMER)

Oceanic
profiler



ROV



Research Vessel



Glider

MRI / Overview, vision and Recommendations

Issues addressed :

- ✓ Mapping of the facilities
- ✓ Open and transnational access to MRI
- ✓ MRI complementary uses for both monitoring and research
=> the EOOS issue (European Ocean Observing System)
- ✓ Set-up common procurement strategies, develop common business models
- ✓ From coordination to integration of distributed MRIs into networks
- ✓ Public-Private collaboration on MRI

1. Mapping of the facilities

An updated and “comprehensive” overview of the marine research infrastructures :

- using 6 categories covering all usual marine sciences :
 - **Research vessels and their underwater vehicles**
 - **In situ data acquisition systems**
 - **Satellites**
 - **Marine data centres**
 - **Marine land-based facilities for ocean engineering**
 - **Experimental facilities for biology and ecosystem studies**
- including the European RI projects type ESFRI, FP7-I3 or éq.

A repository (*developed in continuity within JPI / CSA Oceans*), with information on all facilities involved and opened (or would be) to access for joint activities :

- Information collected for about 800 facilities in Europe,
- Creation with EUROCEAN of a MRI database, now open
- Planned interface with the JPI Oceans web platform
- Targeted users : Scientists, Operators, their engineers et technicians, Policy makers, international, media, public,

1. Mapping of the facilities

>>> MRI Database (EUROCEAN, CSA Oceans, Seas-Era) : <http://rid.eurocean.org/>

EurOcean_RID

CONTRIBUTE YOURSELF TO UPDATE THE DATABASE

If you are aware of any Infrastructure that is not yet in this infobase or any other updates please contact [EurOcean](#) or [insert](#) yourself a new record and updates

SEARCH

NAME

COUNTRY

OPERATOR

MRI CATEGORY

MRI SUBCATEGORY

MRI TYPE

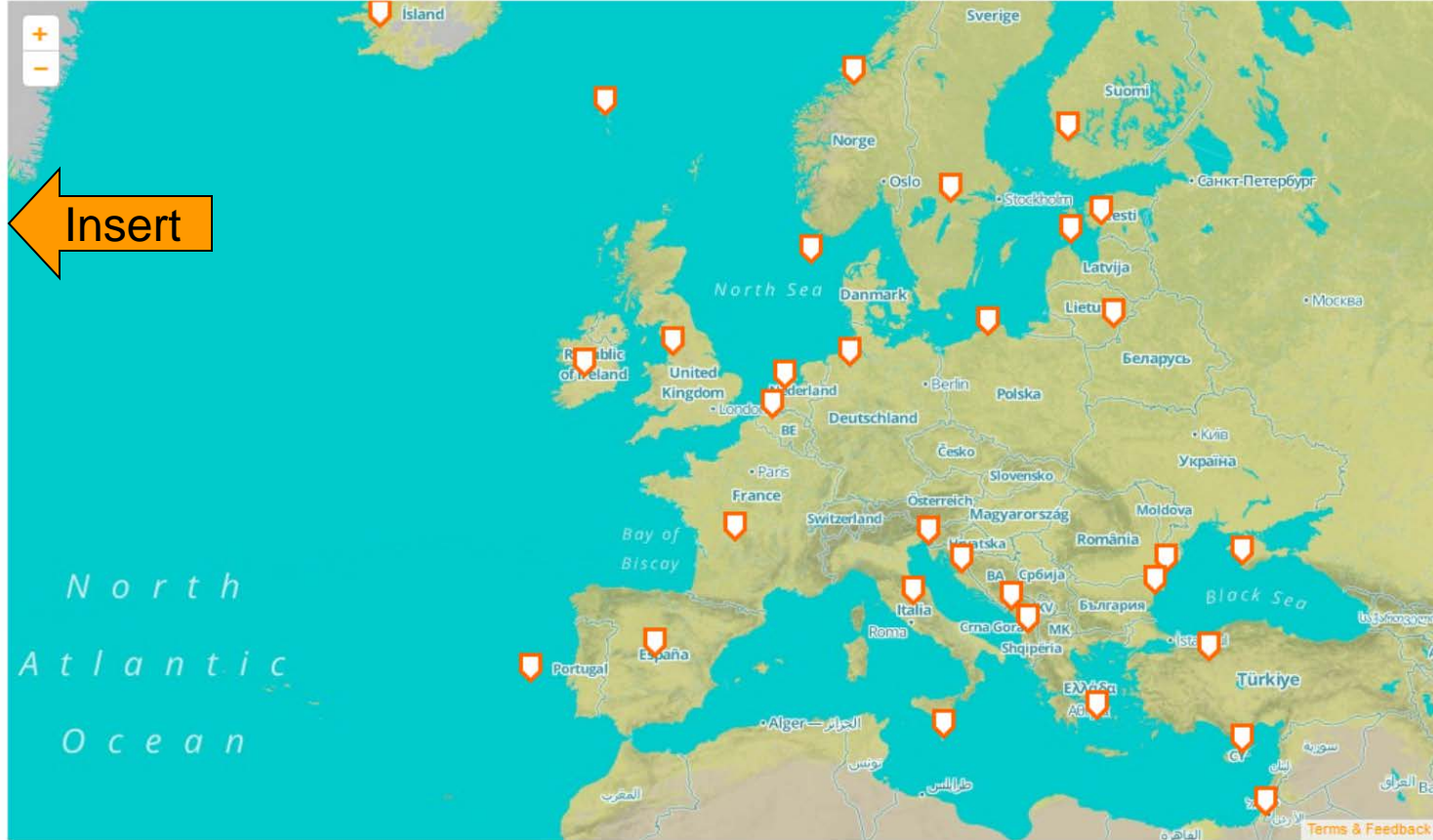
OPERATING AREAS

DISCIPLINES

DISPLAY RESULTS ON THE MAP

DISPLAY RESULTS ON A TABLE

RESET



About the database
 Search tips
 Technical Notes
 Disclaimer

Sources of Information:



Thanks to Sandra Sa and Telmo Carvalho

2. Open and Trans National Access (TNA) to MRI

Typology of Access Formulas :

TNA activity as implemented in the frame of the FP7-I3 projects :

- ✓ The advantage to cover up to 100 % both the access costs and also the travels and subsistences of the scientific teams (up to a certain ceiling).
- ✓ Bottom-up calls, excellence being the main criteria for the evaluation/selection of the applicants.
- ✓ Budget constraints limit its scope to only few % (<< 20%) of the available resources

TNA can also be implemented within the frame of a joint programme :

- ✓ Agreement on a joint scientific programme with multi-annual objectives,
- ✓ Identification of the core MRI needed, and their multi-annual planning,
- ✓ Selection of the scientific teams and organisation of the access,

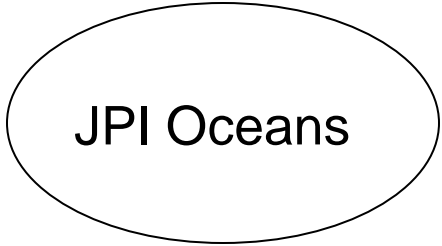
Other specific access with trans national opportunities :

- ✓ OFEG bating process (Ocean Facilities Exchange Group) : TNA to research vessels as a consequence of a logistic first motivation.
- ✓ MRI operator to rent its facility few months a year to another research institute of a nearby country.

3. MRI complementary uses for both monitoring and research => the EOOS issue : from a concept to a « board »

All stakeholders :
(incl. Research, Policies and Industry)

All Funding authorities : EC, MS, Regions, ...

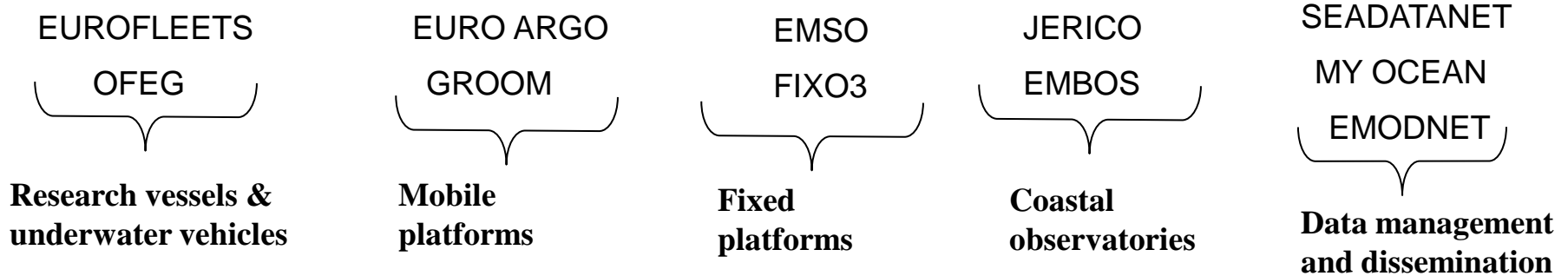


- Key drivers :*
- ✓ Societal needs
 - ✓ Research Frontier
 - ✓ Technology breakthroughs

Observation strategic agenda and priorities



Overarching implementation plan



4. Set-up common procurement strategies, develop common business models

Common procurement strategies and business models are really under developed ! *New investment are still mostly a national affair without real connection with an European vision, with the recent exception of the ESFRI approach.*

General principle : to consult at the Regional / European level before to invest at the national one, to adopt a common rythm to up date the national roadmap.

Regional vessels issue : advisory committee for procurement strategy and implementation, one per region typically, within EUROFLEETS and ERVO (European Research Vessel Operators).

Towards less but modern, multi-purpose and standardised vessels together with mutual programming and use processes at regional level. *An opportunity for adjacent countries sharing the same sea basin !*

The European dimension could also be relevant for small / medium investments of distributed MRI :

- ✓ Observing systems : oceanic profilers, gliders, coastal observatories, ...)
- ✓ Laboratories equipment : marine biology laboratories, experimental facilities for aquaculture, ...
- ✓ Testing facilities for ocean engineering : Ocean energy, ...

5. From coordination to integration of distributed MRIs into networks

With light “Central Offices” heading up the national components :

MRI, like all RI for environmental and life sciences, are distributed into networks. An European ESFRI-like infrastructure could materialize at first by the addition of a light « Central Office » which will head up the national components to bring the adequate degree of European coordination.

The 3 existing ESFRI projects (EURO ARGO, EMSO, EMBRC) are in this process aiming the creation of an ERIC structure.

The 13 projects of particular relevance for the marine sciences, beyond their current EC support, could as well sustain their consortium for coordination and common actions through a similar approach >>> *soon re opening of the ESFRI roadmap for a 3rd revision*

Recommendations include :

- to share a common vision of the governance and missions of such Central Office
- to mobilise the national authorities in supporting the development & strengthening of MRI European consortia in such approach, in the perspective of future joint scientific programmes to implement.

6. Public-Private collaboration on MRI : on shared use (both ways), on shared development

Recommendations :

- ✓ **Improving information of the industrial sector through a dedicated portal :**
 - For information on opportunities and potential of access,
 - For information on current and expected MRI development and their technological challenges.

- ✓ **Designing the appropriate (co-)financing framework :**
 - **More open access to public RI at regional level** for the industrial sector (particularly SMEs) through the instrument of structural funds to stimulate the innovation process,
 - **More use of private infrastructures by public research on two main tracks:**
 - (i) ocean extended observations; (ii) aquaculture purposes,
 - through dedicated FP calls in order to: fill sample gaps, make companies' attitude 'greener', commercially test products,

- ✓ **Adopting the proper managing framework to foster mutual p-p access :**
 - **Providing MRI with a Liaison Office**, acting like a valorization service
 - **Offering incentives and/or adopting directives** (e.g. mixed directive/incentive approach),
 - **Adopting clear methodology according to the different scope of a MRI**, including performance indicators (for p-p collaboration on MRI) and a method to “anticipate the future” together,

Next : 2014-2020 European context and perspective for MRI

From Seas-Era to JPI Oceans :

- o MRI updated overview, repository and database :

 - >>> with EUROCEAN : <http://rid.eurocean.org/>

- o Stakeholders workshop (5-6 june 2013) and consultation :

- o MRI preliminary analysis towards needs and gaps to contribute to the Strategic Research & Innovation Agenda :

 - >>> Deliverable D6.1 (released end of january)

H2020 objectives (DG R&I) :

- o Implementation of 60% ESFRI projects

- o Continuation of the I3 formula,

- o MRI implication in Societal Challenges

EMODNET (DG Mare) , MSFD (DG Env), Copernicus (DG Ent) and Structural Funds opportunities (DG Regio & MS/Regions)

Thank you for your attention



Seas-Era deliverables related to MRI : <http://www.seas-era.eu/np4/19.html>

D4.1.1 “MRI updated overview, European integration and vision of the future” (October 2012) + annexes (Atlantic, Med, Black Sea, Baltic/Bonus RI, Satellites)

D4.2.1 “MRI common management guidelines for joint research activities” (March 2013)

D4.3.1 “Access methodology to both private and public MRI” (October 2013)

CSA Oceans deliverable related to MRI : http://www.jpi-oceans.eu/prognett-jpi-oceans/Nyheter/CSA_Oceans_mapping_and_preliminary_analysis_of_infrastructures/1253992746739/p1253960389452

D6.1 « Mapping and preliminary analysis on marine research infrastructures and human capacity building » (Jan. 2014)

Additional slides

MRI / About the updated overview

Mapping of the Eu projects directly dealing with and operating Marine RI :

About 20 consortia have been constituted in the past 7 years, with operational goals and sustainable perspective, including 3 ESFRI , 7 FP7-I3 and 4 e-infrastructures :

For research vessels and underwater vehicles : EUROFLEETS

For open ocean mobile platforms : EURO ARGO, GROOM

For open ocean fixed point observatories : EMSO, FIXO3

For ocean research drilling : ECORD

For other open ocean in situ measurements : CORIOLIS

For satellites : My Ocean (Copernicus core service)

For costal/shelf seas observatories : JERICO

For data storage and standards : SEADATANET

For data assembling, mining, access : SEADATANET, CORIOLIS, My Ocean, EMODNET, WISE Marine, i-Marine

For marine biology , “omics” and bio-informatics : ASSEMBLE, EMBRC

For marine mesocosms : MESOAQUA

For research on aquaculture : AQUAEXCEL

For ocean engineering : HYDRALAB IV, MARINET

MRI / About the updated overview

A dynamic view, what happens during the 2010-2013 period :

11 new research vessels :

Name	L (m)	Year of launch	Country	Operator
Discovery	99,7	2013	UK	NOC
Angeles Alvariño	46,7	2013	Spain	IEO
Ramon Margalef	46,7	2011	Spain	IEO
Tübitak Marmara	41,2	2013	Turkey	TUBITAK Marmara Research Center
Simon Stevin	36,0	2012	Belgium	VLIZ (Flanders marine institute)
Sanna	32,0	2012	Denmark	Greenland Institute of Natural Resources
Clupea	28,8	2012	Germany	Federal Agency of Agriculture and Food
Aurora	28,0	2013	Denmark	Univ. Aarhus
Socib	23,8	2012	Spain	SOCIB (Balearic Islands)
The Princess Royal	18,9	2011	UK	Univ. Newcastle
Albert Lucas	11,5	2010	France	INSU - CNRS

+ 2 new research vessels under construction :

Sonne II	116	2015	Germany	RF Forschungsschiffahrt GmbH
Kronprins Haakon	100	2016	Norway	IMR

MRI / About the updated overview

A dynamic view, what happens during the 2010-2013 period :

4 new satellites for ocean observation :

Name	Year of launch	Operator	Missions
METOP-B	2012	EUMETSAT	incl. wind speed and direction, sea surface temperature and sea ice concentration.
Meteosat-10	2012	EUMETSAT	incl. sea surface temperature
Saral/Altika	2013	CNES & ISRO	ocean surface topography, surface wind speed, surface wave height
Cryosat-2	2010	ESA	ice sheets that overlay Greenland and Antarctica and marine ice floating in the polar oceans

+ 2 new satellites under construction :

Sentinel 3	2014	ESA / Copernikus	sea-surface topography, sea- and land-surface temperature, ocean colour and land colour
Jason 3	2015	CNES	ocean surface topography, surface wind speed, wave height

MRI / About the updated overview

A dynamic view, what happens during the 2010-2013 period :

8 new subsea/seabed observatories :

Name	Type	Depth (m)	Year of installation	Operators
MOMAR	2 stand-alone acoustic observatories and their transmission buoy	1700	2010	IFREMER, CNRS-IPGP, Univ. Azores
Ligurian sea / Var canyon	1 sub-sea mooring stand-alone observatory	1000	2013	IFREMER, CNRS
LoVe Hovden	1 seabed observatory	255	2013	IMR & Statoil
MARSITE SN4	1 stand-alone seabed observatory	167	2013	INGV, KOERI, IUT / EMCOL, ISMAR, IFREMER
Koljoe Fjord	1 cabled subsea observatory	42	2011	Univ. Gothenburg
MeDON Molene	1 cabled seabed observatory	20	2012	IFREMER, ENSTA Bretagne
MEDA	1 fixed pole subsea observatory	15	2013	GeoEcoMar

MRI / About the updated overview

A dynamic view, what happens during the 2010-2013 period :

, and 7 new subsea/seabed observatories planned in 2014-2015 :

Name	Type	Depth (m)	Year of installation	Operators
PLOCAN / ESTOC & Coastal observatory	1 stand-alone seabed observatory & 1 cabled seabed observatory	3670 & 100	2014	PLOCAN
Poseidon Pylos	1 cabled seabed observatory	1650	2015	HCMR
Ligurian Sea / Nice airport	1 cabled seabed observatory	50	2014	IFREMER, CNRS
Smartbay / coastal observatory	2 cabled subsea stations + 1 power buoy	23	2014	SmartBay Ireland Ltd, MI
OBSEA	A second cabled seabed observatory	20	2014	UPC, SARTI