



Short bibliography on European Marine Research Infrastructures (MRIs)

Deliverable 10.2 Work Package 10 Shared Access to MRIs

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Definition

To understand interactions between the marine environment, climate change and human activities, data, integrated observations and specific experiments require a full range of Marine Research Infrastructures/MRIs (from in situ measurements and experimentations, data management to data assembling) to deliver the best scientific knowledge and services to end-users: *“Infrastructure is the foundation for an ocean observing system, providing the platforms and services to deliver environmental data, information and knowledge. Essential components include both the hardware and core resources including people, institutions, data and e-infrastructure that maintain and sustain operations”* (Navigating the Future IV, European Marine Board 2013).

Without any doubts, MRIs are costly to develop, operate, maintain and upgrade and can benefit from common strategic planning and shared use approaches.

Rationale

Enhancing transatlantic cooperation requires assessing gaps, needs and commonalities on both sides of the Atlantic Ocean. Mapping exercises are therefore needed whether they are based on research topics or cross-cutting areas as infrastructures and communication. The MRIs bibliography presented here is the starting point of such exercise.

Objective

The main objective of this bibliography is to list the most relevant information on MRIs which are of pan-European relevance, targeted especially for Atlantic research and with specific references to:

- 1) MRI related **mapping** exercises;
- 2) MRI **policy/strategy and governance** related position papers;
- 3) MRI **management and operational** initiatives: an attempt has been also made to present and align MRI categories upon Galway research topics, see table1 page 21.

1. MAPPING

Title: *Towards Integrated Marine Research Strategy and Programmes*

Acronym: SEAS-ERA

Type of instrument: EU FP7 Project (Coordination and support action)

Coordinator (organisation/affiliation, country): Beatriz Morales-Nin (Ministerio de Economía y Competitividad, Spain)

Keywords/themes: marine ERA-NET, governance, regional basins

Duration: 48 months (Start Date: 01 May 2010; Completion Date: 30 April 2014)

Funding (if available): € 1.999.927

Abstract/Description:

SEAS-ERA aims at embracing marine and maritime research in its entirety, overarching the previous initiatives which only targeted a given area or basin and, therefore, constituting a stable and durable structure for empowering and strengthening marine research all across Europe.

For MRI, propose a plan for a better and sustainable use of the existing Marine Research Infrastructures (MRIs), developing a coherent vision, in line with the actions undertaken within the Capacity Programme (ESFRI opportunity list). The key issue to be addressed in SEAS-ERA is how to set up scientific joint programs while implementing a regular process for access to these MRIs. Other issues to be addressed are the sharing of a common vision, e.g. an infrastructure strategy for marine research among the Member States and other countries, fostering technological development to improve MRIs quality and service, developing a cooperation frame work and a funding tool box for shared investments, and developing a methodology for the use of industry infrastructures by public research.

Main MRI deliverables:

D4.1.1 (October 2012): *“Marine Research Infrastructures updated overview, European integration and vision of the future”*

+ Annex 1 - Atlantic Region (D 6.4.1),

+ Annex 2 - Mediterranean Region (D 7.4.1),

+ Annex 3 - Black Sea Region (D 8.4.1)

D4.2.1: *“MRIs common management guidelines for joint research activities”*

Results Pertinent to Atlantic Ocean Research Alliance: Updated overview of European Marine Research Infrastructures and strategic discussions on MRI gaps and needs.

US/CA Partners/Interactions: None

South Atlantic Partners/Interactions: None

Links:

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

Marine Research Infrastructures updated overview, European integration and vision of the future:

[http://www.seas-era.eu/np4/%7B\\$clientServletPath%7D/?newsId=19&fileName=D4.1.1_RI_updated_overview_and_vision_V9.pdf](http://www.seas-era.eu/np4/%7B$clientServletPath%7D/?newsId=19&fileName=D4.1.1_RI_updated_overview_and_vision_V9.pdf)

Marine Research Infrastructures common management guidelines for joint activities:

[http://www.seas-era.eu/np4/%7B\\$clientServletPath%7D/?newsId=19&fileName=Deliverable_D_4.2.1.pdf](http://www.seas-era.eu/np4/%7B$clientServletPath%7D/?newsId=19&fileName=Deliverable_D_4.2.1.pdf)

Title: *CSA Healthy and Productive Seas and Oceans*

Acronym: CSA-OCEANS

Type of instrument: EU FP7 Project (Coordination and support action)

Co-ordinator (organisation/affiliation, country): RCN, Norway

Keywords/themes: JPI OCEANS, marine governance

Duration: 36 months (Start Date: 01 Sept 2012)

Funding (if available): EUR 2 337 279

Abstract/Description:

CSA Oceans is a FP7 project which facilitates the implementation of JPI Oceans in its start-up phase. The project will propose tools, procedures and structures for long-term governance and operational cooperation of the Joint Programming activities. Furthermore CSA Oceans will look for best practices and innovative solutions to propose new ways of interaction between the member countries of JPI Oceans.

Main MRI deliverables:

D6.1: Mapping and preliminary analysis of infrastructures, observation - data and human capacity building (2014)

[http://www.jpi-oceans.eu/library?THES\[0\]=169498&page=2](http://www.jpi-oceans.eu/library?THES[0]=169498&page=2)

D6.2: Needs and gaps in infrastructure and human capacity building to feed the SRIA (2014)

Results Pertinent to Atlantic Ocean Research Alliance: Mapping and preliminary analysis of marine research infrastructures and human capacity building.

A repository integrating the results of the mapping was created (<http://rid.eurocean.org/>)

US/CA Partners/Interactions: none

South Atlantic Partners/Interactions: none

Link: [http://www.jpi-oceans.eu/library?THES\[\]=169498](http://www.jpi-oceans.eu/library?THES[]=169498)

Title: *EurOcean Marine Research Infrastructures Database*

Acronym: EurOcean_RID

Type of instrument: Data/infobase informed by results acquired from several EU projects (e.g. SEAS-ERA and CSA Oceans)

Coordinator (organisation/affiliation, country): FCT, Portugal

Keywords/themes: database, InfoBase, projects, infrastructures

Duration: permanent updated/upgraded database/Infobase

Funding (if available): EurOcean members and European projects

Abstract/Description:

EurOcean is a focal point for information on marine science and technology in Europe and its Internet portal is aiming to provide information on topics related to marine science and technology in Europe with a priority given to two main domains: marine research infrastructures and European research, technology and development information. EurOcean contributes to the initiatives aiming to implement a Marine European Research Area and a European maritime policy.

Main MRI deliverables :

European Marine Research Infrastructures Database (RID): <http://rid.eurocean.org/> with includes three specialized modules:

EU Research Vessels Infobase: <http://www.rvinfobase.eurocean.org/>

EU Large exchangeable instruments Infobase: <http://www.lexiinfobase.eurocean.org/>

EU Aquaculture experimental and research facilities Infobase: <http://www.mefinfobase.eurocean.org/>

Marine Knowledge Gate 2.0 (marine EU funded projects, outputs etc.): <http://www.kg.eurocean.org/>

Results Pertinent to Atlantic Ocean Research Alliance

EurOcean maintains a searchable database of all kinds of marine research infrastructures operated in Europe (> 900 facilities recorded) including Research Vessels (RV) for ocean access, underwater vehicles/instruments for deep sea operations, *in-situ* Observing Systems (mobile and fixed autonomous ocean platforms, coastal observatories), Marine Biology labs and Aquaculture research facilities.

US/CA Partners/Interactions: none

South Atlantic Partners/Interactions: none

Link: <http://www.eurocean.org/>

Title: *Aquaculture Infrastructures for Excellence in European Fish Research*

Acronym/reference: AQUAEXECEL

Type of instrument: EU FP7 INFRA I3 project

Co-ordinator (organisation/affiliation, country): INRA/FR (coordinator), NTNU/No (D2.5 main author)

Keywords/themes: aquaculture, research infrastructures, gaps and needs

Duration: March 2011 – February 2015 (48 Months)

Funding: EUR 11,845,000

Abstract/Description:

In order to avoid infrastructure duplication in the planning of new tools and services for future aquaculture development in Europe, a gap analysis was carried out. This in-depth study was based on the conclusions found in the EATIP SRIA and on the currently available expertise and properties in existing RIs in Europe. Conclusions show that European RIs cover a large part of the expertise that is needed to comply with the main challenges in the aquaculture sector. However, several specific goals that were set by the EATIP in its strategic agenda were found not to be sufficiently covered by current RIs in Europe and rely on expertise and/or facilities from 3rd countries or on the development of new research teams and infrastructure.

Main MRI deliverables

The gap analysis revealed a number of knowledge gaps and research infrastructures dealing with gap areas in the thematic areas. This overview includes international RIs including US, Canadian and Brazil ones listed in annex 3 of the deliverable D2.5.

Results Pertinent to Atlantic Ocean Research Alliance: Yes

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: http://www.aquaexcel.eu/images/Deliverables_2015/aquaexcel_d2.5.pdf

Title: *ERA-Marine BioTechnology Open Stakeholder Consultation: Infrastructures and tools*

Acronym/reference: ERA MarineBiotech

Type of instrument : FP7 ERA-NET project

Co-ordinator (organisation/affiliation, country): Steinar Bergseth, Research Council of Norway

Keywords/themes: marine biotechnology, research infrastructures, tools

Duration: 2011-2013

Funding (if available): €1,186,437

Abstract/Description:

Infrastructures and tools could be interpreted as anything from vessels necessary for sampling material for bioprospecting and biodiscovery, but it could also be interpreted as specific tools needed for handling sampled material or processing equipment, including pilot plant facilities. As the toolbox has also been tremendously developed, and continues to develop, analytical equipment and advanced instrumentation at lab scale is also relevant to consider.

Main MRI deliverables

Overall it is estimated that modern infrastructures and tools are essential for the successful development of marine biotechnology, but it is realised that good equipment is very expensive and difficult to get funding for. The quality of existing infrastructure is in general estimated as good, but there is a need for continuous updating if level of research and innovation is to be continued at the present level. Availability is fairly good, but due to lack of collaboration between academia and industry, the two sides are not utilizing existing infrastructure and tools optimally. It is also considered that infrastructures are scattered in Europe.

Results Pertinent to Atlantic Ocean Research Alliance: Yes

US/CA partner interactions: Yes

South Atlantic Partners/Interactions: Yes

Link:

<http://www.marinebiotech.eu/sites/marinebiotech.eu/files/public/D.3.1-3.5%20Report%20on%20ERA-MBT%20Open%20Stakeholder%20consultation.pdf>

Title: *Cooperation EU-US: strengthening the cooperation between the US and the EU in the field of Environmental Research Infrastructures.*

Acronym: COOPEUS

Type of instrument: EU FP7 Project (Coordination and support action) + Support of NSF

Co-ordinator: C.Waldmann (MARUM/University of Bremen, GE)

Keywords/themes: transatlantic cooperation, research infrastructures, ocean observatories

Duration 2012-2015

Funding (if available)

Abstract/Description:

The COOPEUS project was initiated in 2012 bringing together 10 research infrastructures (RIs) in environmental sciences from the EU and US in order to improve the discovery, access, and use of environmental information and data across scientific disciplines and across geographical borders. The COOPEUS mission is to facilitate readily accessible research infrastructure data to advance our understanding of Earth systems through an international community-driven effort, by:

- Bringing together both user communities and top-down directives to address evolving societal and scientific needs;
- Removing technical, scientific, cultural and geopolitical barriers for data use; and
- Coordinating the flow, integrity and preservation of information.

Main MRI deliverables

COOPEUS has come a long way improving the cross-disciplinary and transnational RIs collaboration and inter-workability. COOPEUS' evaluation of the environmental RI landscape and recommendations for actions to facilitate the accessibility of data from research infrastructures to advance our understanding across Earth systems through an international community-driven effort will be presented in the COOPEUS roadmap, which is currently being produced in a collaborative effort by all COOPEUS partners.

[D4.1 – Ocean Observations – fact finding report](#)

[D4.2 – Gap analysis report – Ocean Observations](#)

[D8.2 – COOPEUS RI summary report](#)

Results Pertinent to Atlantic Ocean Research Alliance: Yes

US/CA Partners/Interactions: Yes

US counterparts that are responsible for the NSF funded projects AMISR, EarthScope, DataONE, OOI and NEON

South Atlantic Partners/Interactions: Foreseen

Link: <http://www.coopeus.eu/>

2. STRATEGY & POLICY

Title: *A framework for ocean observing*

Acronym: #

Type of instrument: Position/strategic document

Coordinator (organisation/affiliation, country): post-OceanObs'09 Task Team

Keywords/themes: marine observations, observing systems

Duration: #

Funding: #

Abstract/Description: this Executive Summary of the report on A Framework for Ocean Observing (IOC/INF-1185) was prepared by the post-OceanObs'09 Task Team, commissioned by the sponsors of the conference (www.oceanobs09.net, 21–25 September 2009, Venice, Italy) to recommend a framework for sustained and integrated ocean observing.

Main MRI deliverables

Report: http://www.oceanobs09.net/foo/FOO_Report.pdf

Results Pertinent to Atlantic Ocean Research Alliance

The report has informed a draft resolution on "*Strengthening and Streamlining GOOS*" anticipated as an outcome of the Tenth Session of the Intergovernmental Committee for GOOS (I-GOOS-X, UNESCO, Paris, 20 June 2011).

US/CA Partners/Interactions: Yes

South Atlantic Partners/Interactions: Yes

Links:

<http://www.oceanobs09.net>

<http://unesdoc.unesco.org/images/0021/002111/211196e.pdf>

Title: *Oceans and Society: Blue Planet (GEO)*

Acronym: #

Type of instrument: Position/strategic document

Coordinator (organisation/affiliation, country): POGO (Partnership for Ocean Global observations)

Keywords/themes: Ocean observations, societal challenges

Duration: #

Funding: #

Abstract/Description:

Oceans and Society: Blue Planet" is the over-arching Marine Task within the Group on Earth Observations (GEO). GEO is an intergovernmental body dedicated to the effective use of Earth observation (in situ or via remote sensing) for societal benefit. It is comprised of 90 member nations, the European Commission and 77 Participating Organizations, including POGO, GOOS and CEOS.

"Oceans and Society: Blue Planet" seeks, through the mobilisation of expert knowledge, to raise public awareness of the role of the oceans in the Earth system, of their impacts (good and bad) on humankind, and of the societal benefits of ocean observations; to coordinate the various marine initiatives within GEO and develop synergies between them; and to advocate and advance the establishment and maintenance of a global observing network for the oceans, which acknowledges the value of ocean observations and their contribution to helping alleviate societal issues in multiple areas.

In 2012, GEO was restructured following a new [Work Plan](#) for 2012-2015. POGO submitted a proposal for a new Task on Oceans, with the aim to bring together all the ocean observing elements within GEO and enhance their visibility. The proposal was accepted, and "Oceans and Society: Blue Planet" was included in the "Societal Benefits" section of the Work Plan. The Task was officially launched during a Kick-Off Symposium in Brazil in November 2012.

The Global Earth Observation System of Systems ([GEOSS](#)) aims to supply decision support tools to a wide variety of users, by linking together existing and planned observing systems around the world and support the development of new ones where gaps currently exist. GEOSS addresses nine "societal benefit areas" (SBA) of critical importance to people and society. The ocean impacts on all of these. Blue Planet focuses particularly, but not exclusively, on Climate, Ecosystems, Agriculture and Biodiversity.

Main MRI deliverables

Book: *"Oceans and Society: Blue Planet Book"*

The book is structured around the six components of the Blue Planet Task. Targeted at all stakeholders within the ocean and marine community, this volume discusses current activities and future actions and raises awareness for the further development and implementation of the Blue Planet agenda. Readers will learn more about ocean observations, how they can be integrated, and their applications to benefit society as a whole.

<http://www.oceansandsociety.org/products/book.html>

Blue Planet White Paper: <http://www.oceansandsociety.org/files/white-paper.pdf>

Results Pertinent to Atlantic Ocean Research Alliance: "Global Integration of Ocean observations" and their applications to benefit society as a whole.

US/CA Partners/Interactions: Yes

South Atlantic Partners/Interactions: Yes

Links:

<http://www.oceanobs09.net>

<http://unesdoc.unesco.org/images/0021/002111/211196e.pdf>

Title: *European Strategy for Marine and maritime research*

Acronym: COM (2008)534

Type of instrument: position/strategic document

Coordinator (organisation/affiliation, country): European Commission

Keywords/themes: European maritime policy

Duration: #

Funding: #

Abstract/Description:

The Commission's strategy has been developed along two principal strands. The first consists of improving the capacity of European research to tackle the complexity of marine ecosystems, while the other aims to develop new forms of governance.

A number of actions are proposed which apply to:

- capacity-building in terms of infrastructure (for example, monitoring and data collection facilities, ocean observatories, sub-sea technologies and specialised research vessels), innovation and education;
- the development of integration between knowledge and observation data as well as the promotion of interdisciplinary research activities on cross-cutting themes (for example the impact of human activity on coastal and marine ecosystems or the protection and exploitation of marine biodiversity), including technology transfer ;
- the promotion of synergies through a combination of different forms of funding both private and at regional, national and Community levels. It also plans to develop international cooperation because the problems related to the oceans have a global dimension.

This strategy follows the [Communication](#) of October 2007 called "An Integrated Maritime Policy for the European Union". In this Communication the Commission reasserted that its main objective was to create the necessary conditions for growth in maritime activities, whilst also ensuring the protection of marine ecosystems in accordance with the [Strategy for the marine environment](#).

This strategy constitutes a separate element of the European Research Area. It represents one of the first attempts to fully establish the ERA within a specific research sector.

Main MRI deliverables

http://ec.europa.eu/research/participants/portal4/doc/call/fp7/fp7-ocean-2011/30283-com%282008%29534-a_european_strategy_for_marine_and_maritime_research_en.pdf

Results Pertinent to Atlantic Ocean Research Alliance

European Strategy for Marine and maritime research, of which international cooperation is a key component

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link (same as above):

http://ec.europa.eu/research/participants/portal4/doc/call/fp7/fp7-ocean-2011/30283-com%282008%29534-a_european_strategy_for_marine_and_maritime_research_en.pdf

Title: *Marine Knowledge 2020: marine data and observation for smart and sustainable growth*

Acronym/reference: [COM \(2010\) 461](#)

Type of instrument: Position/strategic document

Co-ordinator (organisation/affiliation, country): European Commission

Keywords/themes: European maritime policy, data management, scientific knowledge

Duration: #

Funding: #

Abstract/Description: this Communication proposes an action plan intended to improve the use of scientific knowledge through a more coordinated approach to marine data collection and assembly.

Results Pertinent to Atlantic Ocean Research Alliance

Improving knowledge of the seas and oceans is one of the three cross-cutting tools of the [EU's integrated maritime policy](#). This instrument can also contribute towards the objectives of the other two instruments, namely [better spatial planning](#) and [integrated maritime surveillance](#).

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV:ev0025>

Title: *Global change: towards global research infrastructure, EU support for research infrastructures in environmental and earth sciences*

Acronym/reference: [EC Report 2012 EUR 25253](#)

Type of instrument: Position/strategic document

Coordinator (organisation/affiliation, country): European Commission

Keywords/themes: environmental research infrastructures

Duration: #

Funding: #

Abstract/Description:

European landscape for environmental research infrastructures: EU support for the development of pan-European research infrastructures including for ocean and marine research.

Results Pertinent to Atlantic Ocean Research Alliance: International cooperation is promoted

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Links: https://ec.europa.eu/research/infrastructures/pdf/global_change.pdf

Update: <https://ec.europa.eu/research/infrastructures/pdf/thematic/KI0414648ENE-environment.pdf#view=fit&pagemode=none>

Title: *Towards European Integrated Ocean Observation*

Acronym/reference: [DG R&I Expert group report on MRI, January 2013](#)

Type of instrument: Position/strategic document

Coordinator (organisation/affiliation, country): European Commission

Keywords/themes: ocean observation, research infrastructures

Duration: #

Funding: #

Abstract/Description:

Launched in 2007, the EU maritime policy (IMP) pursues the broad objective of an integrated and sustainable development of sea-related activities. The EU Strategy for Marine and Maritime Research for Marine and Maritime Research COM (2008)534 was adopted in 2008 to provide a solid science base to the IMP and respond to societal needs such as blue growth, the good environmental status of the seas, the adaptation to climate change and marine/coastal safety. The strategy considers the coordinated development of marine research infrastructures at European level in relation to these needs as an essential objective to be pursued by the Commission in cooperation with Member States. Marine Research Infrastructures (MRIs) must also be managed at the European scale because marine challenges do not stop at national borders and synergies can be achieved at European level. The establishment of the expert group on MRIs, in March 2010, was one of the actions undertaken to pursue the strategy objective of promoting European marine research infrastructures. The objectives of the expert group were to identify important gaps and needs in European scale MRIs, propose mechanisms to link MRI needs with funding opportunities and advise on governance for European scale MRI. The Group focused its work on MRIs, which support directly or indirectly the collection and use of marine data, i.e. marine observation infrastructures, because ocean observation is a key enabling area of activity, which underpins all marine and maritime activities. It also decided to take a strategic approach, looking at the “big picture” in terms of governance and identifies big gaps and strategic issues in qualitative terms.

Results Pertinent to Atlantic Ocean Research Alliance: International cooperation is promoted

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: https://ec.europa.eu/research/infrastructures/pdf/toward-european-integrated-ocean-observation-b5_allbrochure_web.pdf

Title: *Towards a Charter for Access to Research Infrastructures*

Acronym/reference: #

Type of instrument: position/strategic document

Co-ordinator (organisation/affiliation, country): European Commission

Keywords/themes: Research infrastructure transnational Access

Duration: #

Funding: #

Abstract/Description:

The Charter of Access to Research Infrastructures is developed by the Commission in close cooperation with the ESFRI, the e-IRG and the ERA Stakeholder Organisations.

The Charter is a follow-up to the July 2012 ERA Communication on "a Reinforced European Research Area Partnership for Excellence and Growth" and has the purpose of setting out non-regulatory principles and guidelines to be used, on a voluntary basis, as a reference when defining or re-defining rules and conditions for Access to Research Infrastructures. Furthermore, it promotes Access to research in the sense of setting the basis, whenever possible or appropriate, for Users, wherever located, to obtain Access to the best Research Infrastructures (again wherever located) and to the related services in order to conduct innovative research and take part in collaborative research efforts that will finally lead to excellent science.

The Charter sets the basis for a common understanding of what an Access policy for Research Infrastructures is and of its underlying implications and, at the same time, encourages the different infrastructures to ensure a maximum level of transparency of their Access processes and procedures.

Results Pertinent to Atlantic Ocean Research Alliance: research infrastructure access to be promoted through transatlantic cooperation

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link:

https://ec.europa.eu/research/infrastructures/pdf/2015_charterforaccessto-ris.pdf#view=fit&pagemode=none

Title: *EuroGOOS AISBL Strategy 2014-2020 (September 2014)*

Acronym/reference: #

Type of instrument: position/strategic document, network

Co-ordinator (organisation/affiliation, country): EuroGOOS Secretariat, Belgium

Keywords/themes: research infrastructure transnational access

Duration: #

Funding: members contributions, EU projects

Abstract/Description:

The core activity of EuroGOOS is the development and operation of regional operational systems. Five systems are at present part of EuroGOOS: the Arctic (Arctic ROOS), the Baltic (BOOS), the North West Shelf (NOOS), the Ireland-Biscay-Iberian area (IBI-ROOS) and the Mediterranean (MONGOOS). Strong cooperation within these regions, enabling the involvement of many more regional partners and countries, forms the basis of EuroGOOS work, and is combined with high-level representation at European and Global forums.

The present strategy sets the scene for the work of EuroGOOS for 2014-2020 containing the following key elements:

- Identify European priorities for operational Oceanography: main focus will be on defining research priorities and relate to key European initiatives such as Copernicus, EMOD-net and Marine Research Infrastructures. As part of this activity EuroGOOS will also work intensively on linking to the research community, industry, users and EU policies.
- Promotion of operational oceanography: key elements here are networking, publications, conferences, EuroGOOS webpage, social media and increased engagement with various organisations such as GOOS Regional Alliances, GEO, JPI-Oceans.
- Foster Cooperation: EuroGOOS will actively engage itself in close cooperation with key organisations on a global, European and regional scale.
- Co-production: to allow for reduction in costs and higher specialization EuroGOOS will support actions leading to commonly available operational, observation and model-based, products and services among its members. EuroGOOS will specifically aim to better coordinate coproduction for the Marine Strategy Framework Directive (MSFD) Sustained Ocean Observations and will take a leading role to ensure coordination of the European contribution to a sustained marine observational system through the promotion of a European Ocean Observing System (EOOS) with EU Copernicus Marine Service, EMODnet, EU Marine Research Infrastructures, JPI Oceans, EEA, ESA, EUMETSAT and its national members.

Results Pertinent to Atlantic Ocean Research Alliance: research infrastructure access to be promoted through transatlantic cooperation

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link:

https://ec.europa.eu/research/infrastructures/pdf/2015_charterforaccessto-ris.pdf#view=fit&pagemode=none

Title: *Eurocean Conferences*

Acronym/reference: #

Type of instrument: position/strategic document, network, conference

Coordinator (organisation/affiliation, country): European Marine Board (EMB)

Keywords/themes: marine research, governance, science-policy interface

Duration: #

Funding: members contributions, EC

Abstract/Description:

[EuroOCEAN Conferences](#) are major European marine science policy conferences providing a forum for policy makers and strategic planners both at European and Member State level to interface with the marine research community and marine and maritime stakeholders.

Previous EUROCEAN conferences were held in Brussels (1994), Sorrento (1996), Lisbon (1998), Hamburg (2000), Galway (2004), Aberdeen (2007), Ostend (2010) and Rome (2014).

The distinctive feature that characterizes EuroOCEAN conferences is the focus on bringing the stakeholders together to speak with one voice towards policy. Since EuroOCEAN 2004, conference delegates have delivered joint policy statements, EuroOCEAN Declarations, to raise decision makers' awareness of the marine research priorities and propose concrete actions. These statements have been critical drivers of research and policy developments in Europe since.

[EuroOCEAN 2014](#) (07-09 October 2014, Rome, Italy) highlighted the importance of Blue Growth and commercially-driven research, equally emphasizing that a growing and sustainable maritime economy will also require a much greater knowledge and understanding of marine ecosystem functioning and resilience. As key output, EuroOCEAN 2014 delivered the **Rome Declaration** ([PDF](#)) - a common vision on achieving an ecosystem approach to the management of Europe's marine resources as a fundamental requirement for sustainable Blue Growth and European leadership in marine science and technology.

Main MRI deliverables

Since EuroOCEAN 2004, conference delegates have delivered joint policy statements, EuroOCEAN Declarations, to raise decision makers' awareness of the marine research priorities and propose concrete actions. These statements have been critical drivers of research and policy developments in Europe since.

Results Pertinent to Atlantic Ocean Research Alliance: Yes

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: <http://www.marineboard.eu/eurocean>, <http://www.euroceanconferences.eu/>

Title: *Navigating the Future IV (2013)*

Acronym/reference: NFIV

Type of instrument: position/strategic document, network

Coordinator (organisation/affiliation, country): European Marine Board (EMB)

Keywords/themes: marine research, priorities and societal challenges, science-policy interface

Duration: *Navigating the Future* series

Funding: Members' contributions

Abstract/Description:

The European Marine Board provides a platform for member organizations to develop common priorities, to advance marine research, and to bridge the gap between science and policy to meet future marine science challenges and opportunities.

The Marine Board *Navigating the Future* series provides regular pan-European summaries of the current status of marine research, priority recommendations and future scientific challenges in the context of European societal needs. *Navigating the Future* is a blueprint to guide both the research and the science policy agendas at European and national level. Since 2001 when the first *Navigating the Future* position paper was published, the series has been widely recognized, both by researchers and science policymakers, as providing critical periodic foresight and recommendations on emerging marine science topics and needs, and associated societal challenges and opportunities.

Navigating the Future IV (2013) is designed to inform the Commission calls under the forthcoming Horizon 2020 programme. The paper is organized around the framework of key societal challenges in the areas of climate, human health, food security, energy and safe and sustainable use of marine space. NFIV also addresses strategic and enabling issues such as European Ocean Observing System (EOOS), training, the science-policy interface and ocean literacy.

Results Pertinent to Atlantic Ocean Research Alliance: Chapter 11 dedicated to European Ocean Observing System.

US/CA partner/ interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: <http://www.marineboard.eu/navigating-future-0>

Title: *Strategic Research and Innovation Agenda (2015)*

Acronym/reference: SRIA

Type of instrument: Position/strategic document, network

Coordinator (organisation/affiliation, country): Joint Programming Initiative Oceans (JPI Oceans)

Keywords/themes: marine governance, funding agencies

Duration: #

Funding: member states

Abstract/Description:

The Strategic Research and Innovation Agenda contributes to implement the Blue Growth agenda of the European Commission: it presents ten Strategic Areas, developed and agreed by JPI Oceans (with the support of [CSA Oceans](#)) as strategic priorities for marine and maritime research in Europe.

- Exploring Deep Sea Resources
- Technology and Sensor Developments
- Science Support to Coastal and Maritime Planning and Management
- Linking Oceans, Human Health and Wellbeing
- Interdisciplinary Research for Good Environmental Status
- Observing, Modelling and Predicting Oceans State and Processes
- Climate Change Impact on Physical and Biological Ocean Processes
- Effects of Ocean Acidification on Marine Ecosystems
- Food Security and Safety Driving Innovation in a Changing World
- Use of Marine Biological Resources through Development and Application of Biotechnology

Actions within the Strategic Areas will vary in size, scope and duration. Specific actions in the cross-cutting fields of research infrastructures, science-policy interactions, and human capacity building are also identified as being necessary to address the overall vision.

Main MRI deliverables

The SRIA will provide the basis for the selection and implementation of joint actions. Actions will be taken forward when at least four countries agree to participate within JPI Oceans. The actions will make use of a range of fit for purpose tools and will always seek to align efforts at a European level. The Management Board of JPI Oceans is currently discussing which actions will be taken forward in the first phase of implementation. These activities will be published in an Operational Plan.

Results Pertinent to Atlantic Ocean Research Alliance: Yes

US/CA partners interactions: Yes

South Atlantic Partners/Interactions: Yes

Link: <http://www.jpi-oceans.eu/library>

3. Management & Operations

European projects and initiatives dealing with marine research infrastructures are supported by different funding streams to perform various activities and/or objectives, such as:

- Networking activities, from cross-border coordination to pan-European integration;
- Trans-national access;
- Joint collaborative development of new technologies for upgraded facilities,
- Public services (for and beyond research community) through permanent portals.

Most of them, in their respective domain, have developed both strategic visions and implementation actions.

The **table1** below lists different MRIs categories with specific reference to past and on-going MRI initiatives and projects.

PS1: this categorization has been based on previous studies (EC Working Group on ocean observation, Seas-ERA FP7 project, US National Research Council) and intends to link up with the Galway research topics.

PS2: for further details on the different project/initiatives see following Annex 1.

Type of research infrastructure	Operational European projects & Initiatives	Linkages with Galway research priorities						Main International links
		<i>Ecosystem Approach</i>	<i>Observing Systems</i>	<i>Bio-technology</i>	<i>Aquaculture</i>	<i>Ocean Literacy</i>	<i>Seabed mapping</i>	
Research Vessels & equipment								
Research Vessels and their underwater vehicles and instrument (ROV, AUV, Corer, ...)	EUROFLEETS <i>OFEG</i>	XX ¹	XXX			X	XXX	IRSO UNOLS
In situ observing systems								
Mobile ocean observatories (oceanic profilers, gliders, drifters, ...)	Euro-ARGO E-AIMS GROOM	X	XXX			X	X	ARGO/GOOS International Ocean Glider Community
Fixed point open ocean observatories (Oceanic moorings, Seafloor stations, ...)	EMSO FIXO3	XX	XXX	X		X	X	ARGO/GOOS IOOS Neptune-Canada IMOS

¹ X to XXX: from loose to tight interactions

Coastal observatories (Coastal automated stations & buoys, HF Radar, Ferrybox, Gliders, ...)	JERICO GROOM	X	XXX	X	X	X	X	ARGO/GOOS IOOS Venus Canada
Integrated Atlantic Ocean Observing System	ATLANTOS	X	XXX			X	X	ARGO/GOOS IOOS Ocean Network Canada

		<i>Ecosystem Approach</i>	<i>Observing Systems</i>	<i>Bio-technology</i>	<i>Aquaculture</i>	<i>Ocean Literacy</i>	<i>Seabed mapping</i>	
Satellites for ocean and coastal observation								
Satellites	<i>Copernicus Sentinels & other ESA Earth Obs. Sat</i>							NASA
	JASON	X	XXX				X (Coastal)	NOAA
	SARAL-Altikal							CSA
	PLEIADES HR							
Marine Data Management								
Data management (Data collect, validation, storage, assembling, dissemination)	SEADATANET							
	ODIP							
	<i>Copernicus CMEMS</i>							
	i-Marine							
	<i>EMODNET</i>	XXX	XXX		X	X	XXX	IODE
	<i>European Atlas of the Seas</i>							OBIS
	<i>EEA Waterbase JRC EMIS ICES Data Centre</i>							
Land-based facilities								

Ocean Engineering research facilities (instrument and vehicle testing labs and basins, sensors calibration, ...)	MARINET HYDRALAB IV		XX				XX	
Marine Biology laboratories (from genes to macro-species)	EMBRC	X	X	XXX	X	X	X	WAMS-IOC
		<i>Ecosystem Approach</i>	<i>Observing Systems</i>	<i>Bio-technology</i>	<i>Aquaculture</i>	<i>Ocean Literacy</i>	<i>Seabed mapping</i>	
Aquaculture research facilities (land based and sea based facilities)	AQUAEXCEL	XXX		X	XXX	X		
Facilities for aquatic ecosystem studies (Mesocosm)	MESOAQUA	XXX	X	X	XXX	X		

Table 1: Marine research Infrastructures: categories, affiliated projects and initiatives and links with international players

Annex 1 – List of MRIs

1 - The 5 main categories of MRIs

Cat1: Research Vessels & equipment

- **EUROFLEETS (2009-2013) and EUROFLEETS 2 (2013-2016)**
Project name: *New operational steps towards an alliance of European research fleets*
Website: <http://www.eurofleets.eu/np4/home.html>
- **OFEG (since 1996)**
Project name: *Ocean Facilities Exchange Group*
Website: <http://www.ofeg.org/>

Cat2: In situ observing systems

- **EURO-ARGO ERIC (since 2014)**
European contribution to Argo program
Website: <http://www.euro-argo.eu/>
- **E-AIMS (2013-2016)**
Euro-Argo Improvements for the GMES Marine Service
Website: <http://www.euro-argo.eu/EU-Projects-Contribution/E-AIMS>
- **GROOM (2012-2015) :**
Gliders for Research, Ocean Observation and Management
Website: <http://www.groom-fp7.eu/doku.php?id=start>
- **EMSO (ESFRI project since 2006, EMSODEV (2015-2018), EMSO ERIC expected by end 2015)**
:
European Multidisciplinary Seafloor and water column Observatory
Website: <http://www.emso-eu.org/>
- **FIXO3 (2013-2016) :**
Fixed point Open Ocean Observatory
Website: <http://www.fixo3.eu/>
- **JERICO (2011-2015) and JERICO NEXT (2015-2019)**
Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories
Website: <http://www.jerico-fp7.eu/>
- **ATLANTOS (2015-2019) :**
Optimizing and Enhancing the Integrated Atlantic Ocean Observing System
Website: <https://www.atlantos-h2020.eu/>

Cat3: Satellites

- **Copernicus Sentinels and other ESA Earth Observing satellites :**
http://www.esa.int/Our_Activities/Observing_the_Earth
- **JASON satellites (CNES, EUMETSAT, NASA, NOAA) :**
JASON-2 / Ocean Surface Topography Mission (OSTM)

http://www.nasa.gov/mission_pages/ostm/overview/index.html#.VbnNyvm8T6M

JASON-3: launch postponed

<https://sealevel.jpl.nasa.gov/missions/jason3/>

- **SARAL-Altika satellite (France/CNES + India/ISRO) :**
Ocean surface topography

<https://altika-saral.cnes.fr/en/SARAL/index.htm>

- **PLEIADES HR satellites (CNES) :**
High resolution observing and mapping Earth's surface (incl. coastal areas)

<https://pleiades.cnes.fr/en/PLEIADES/index.htm>

- **Copernicus Marine Service CMEMS (since May 2015) :**
Copernicus Marine Environment Monitoring Service (following MyOcean (2009-2012), MyOcean2 (2012-2014) and MyOcean follow-on (October 2014- March 2015) projects)

<http://marine.copernicus.eu/>

Cat4: Marine data management

- **SEADATANET (2006-2011) and SEADATANET 2 (2011-2015) :**
Pan-European infrastructure for Ocean and Marine data management

<http://www.seadatanet.org/>

- **ODIP (2012-2015) :**
Ocean data Interoperability Platform

http://www.odip.eu/content/content.asp?menu=0010000_000000

- **CMEMS (since May 2015, following MyOcean (2009-2012) , MyOcean2 (2012-2014) and MyOcean follow-on (October 2014- March 2015) projects) :**
Copernicus Marine Environment Monitoring Service

<http://marine.copernicus.eu/>

- **i-Marine (since 2011)**
Data e-Infrastructure Initiative for Fisheries Management and Conservation of Marine Living Resources

<http://www.i-marine.eu/pages/Home.aspx>

- **DG Mare EMODNET (since 2009) :**
European Marine Data and Observation Network

<http://www.emodnet.eu/>

- **DG Mare European Atlas of the Seas :**
http://ec.europa.eu/maritimeaffairs/atlas/maritime_atlas/#lang=EN;p=w;

- **EEA Waterbase - Transitional, coastal and marine waters**
<http://www.eea.europa.eu/data-and-maps/data/waterbase-transitional-coastal-and-marine-waters-11>

- **JRC EMIS (Environmental Marine Information System) :**

<http://emis.jrc.ec.europa.eu/>

- **ICES Data Centre**
<http://admin.ices.dk/Submissions/index.aspx?t=1>

Cat5: Land-based facilities

Ocean Engineering research facilities

- **HYDRALAB IV (2011-2015)**
More than water, dealing with the complex interaction of water with environmental elements, sediment, structures and ice
<http://www.hydralab.eu/>
- **MARINET (2011-2015) :**
Marine Renewables Infrastructure Network
<http://www.fp7-marinet.eu/>

Research facilities for marine biology, aquaculture and ecosystem studies

- **EMBRC (ESFRI project since 2010) :**
European Marine Biological Resource Centre
<http://www.embrc.eu/>
- **ASSEMBLE (2009-2013)**
Association of marine biological laboratories
<http://www.assemblemarine.org/>
- **AQUAEXCEL (2011-2015) and AQUAEXCEL 2020 (2015-2019)**
Aquaculture infrastructures for excellence in European fish research
<http://www.aquaexcel.eu/>
- **MESOAQUA (2009-2012)**
Network of leading MESOCOSM facilities to advance the studies of future AQUATIC ecosystems from the Arctic to the Mediterranean
<http://mesoaqua.eu/>

2 – Others related marine research infrastructures projects/initiatives

2.1 – An all embracing EU Environmental project: the ENVRI-Plus project

- **ENVRI (2010-2014) & ENVRI-Plus (2015-2018) connecting all marine ESFRI and EU RTD projects together**
Environmental research infrastructures providing shared solutions for sciences and society
<http://envri.eu/>

Liaising with

- o **LIFEWATCH: e-Science EU Infrastructure for Biodiversity and Ecosystem research**
<http://www.lifewatch.com/>
- o **ICOS: Integrated Carbon Observation System** (atmospheric, terrestrial + marine)
<https://www.icos-ri.eu/>
- o **SIOS : Svalbard Integrated Arctic Earth Observing System**
http://www.sios-svalbard.org/prognett-sios/Home_page/1234130481072

2.2 - European joint collaborative development of new technologies for upgraded facilities

In complement to the above mentioned projects which themselves include usually new technologies development, there are other collaborative projects (granted through FP7 Oceans of Tomorrow and H2020 Blue Growth calls), which are directly focused either on new in situ sensors or on new fixed/mobile platforms or underwater vehicles.

For new in situ sensors development

- **BRAAVOO (2014-2016) :**
Biosensors, Reporters and Algal Autonomous Vessels for Ocean Operation
<http://www.braavoo.org/#slide-1>
- **EnviGuard (2014-2018) :**
Development of a biosensor technology for environmental monitoring and disease prevention in aquaculture ensuring food safety
<http://www.enviguard.net/>
- **MariaBox (2014-2017) :**
MARINE environmental in situ Assessment and monitoring tool BOX
<http://www.cyric.eu/projects/mariabox.html>
- **SEA-ON-A-CHIP (2014-2017) :**
Real time monitoring of SEA contaminants by an autonomous Lab-on-a-CHIP biosensor
http://www.sea-on-a-chip.eu/V1/SOC50V4_Main.php
- **SMS (2014-2017) :**
Sensing toxicants in marine waters makes sense using biosensors
<http://www.project-sms.eu/>
- **COMMON SENSE (2013-2016) :**

Cost-effective sensors, interoperable with international existing ocean observing systems, to meet EU policies requirements

<http://www.commonenseproject.eu/>

- **NEXOS (2013-2017) :**
New cost-effective, innovative and compact integrated multifunctional sensor systems (ocean optics, ocean passive acoustics, and sensors for an Ecosystem Approach to Fisheries (EAF))
<http://www.nexosproject.eu/>
- **SCHeMA (2013-2017) :**
Integrated in Situ Chemical Mapping Probes
<http://www.schema-ocean.eu/>
- **SenseOCEAN (2013-2017) :**
Marine sensors for the 21th Century
<http://www.senseocean.eu/>

Multi-use offshore platforms new concepts

- **H2OCEAN (2012-2014) :**
Development of a wind-wave power open-sea platform equipped for hydrogen generation with support for multiple users of energy
<http://www.h2ocean-project.eu/>
- **MERMAID (2012-2015) :**
Innovative Multi-purpose offshore platforms: planning, design & operation
<http://www.mermaidproject.eu/>
- **TROPOS (2012-2015) :**
Modular Multi-use Deep Water Offshore Platform
<http://www.troposplatform.eu/>

New or upgraded underwater vehicles

- **DexROV (2015-2018)**
Dexterous ROV: effective dexterous ROV operations in presence of communication latencies.
<http://www.dexrov.eu/>
- **BRIDGES (2015-2019) :**
Bringing together Research and Industry for the Development of Glider Environmental Services
<http://www.bridges-h2020.eu/>
- **SWARMS (2015-2018) :**
Smart and Networking UnderWater Robots in Cooperation Meshes
https://www.etsist.upm.es/uploaded/eventos/eventos/SWARMS_kickoff.pdf
- **ARROWS (2012-2015) :**
ARchaeological ROBot systems for the World's Seas
<http://www.arrowsproject.eu/>

2.3 Global structures/initiatives in close relation with marine research infrastructure developments and strategies

- **EFARO**
European Fisheries and Aquaculture Research Organisation
<http://www.efaro.eu/>

(e.g. interactions with AQUAEXCEL)

- **EGO (since 2006)**
Everyone's Gliding Observatories
<http://www.ego-network.org/dokuwiki/doku.php?id=start>

(links with GROOM and BRIDGES)

- **EuroGOOS (since 1994)**
European Global Ocean Observing System
<http://eurogoos.eu/>

(links with with EuroArgo and all Ocean observing systems)

- **European Marine Board (EMB)**
Pan-European platform to develop common priorities, to advance marine research and to bridge the gap between science and policy, in order to meet future marine science and societal challenges and opportunities.
<http://www.marineboard.eu/>

- **ERVO (since 1999)**
European Research Vessel Operators
<http://www.ervo-group.eu/np4/home.html>

(links with EUROFLEETS and OFEG)

- **ESONET-Vi (since 2009)**
Virtual Institute of Scientific Users of Deep Sea Observatories
<http://visobservatories.webs.com/>

(links with EMSO and FIXO3)

- **MARS**
The European Network of Marine Research Institutes and Stations
<http://www.marsnetwork.org/>

(links with EMBRC and Lifewatch)