



Towards integrated European marine
research strategy and programmes

Seas-era
EUFP7ERA-NET

<http://www.seas-era.eu>



Inventory of Research, Monitoring and Technological programs and identification of the commonalities and gaps

WP2-Task2.1-D2.1.1

March 2013

ANR/Ifremer



D.2.1.1: Inventory of Research, Monitoring and Technological programs and identification of the commonalities and gaps

Grant Agreement n° 249552

Acronym: SEAS-ERA

Title: Towards Integrated Marine Research Strategy and Programs

WP2: Common Programs

Task 2.1: Inventory of Research, Monitoring and Technological programmes and identification of the commonalities and gaps

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Deliverable N°: Seas-era_WP2_D 2.1.1

Due date of deliverable: M16

Actual submission date: M35

Security: PU

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Document Information	
Document Name	Inventory of Research, Monitoring and Technological programmes and identification of the commonalities and gaps
Document ID	Seas-era_WP2_D 2.1.1
Version Date	March 2013
Task Leader	ANR
Author/Organisation	ANR/Maurice Heral – Ifremer/Sophie Sergent
Security	PU

History				
Version	Date	Modification		
1	January 2013	Draft Version	Inventory of Research, Monitoring and Technological programmes and identification of the commonalities and gaps	
2	March 2013	Final Version	Inventory of Research, Monitoring and Technological programmes and identification of the commonalities and gaps	

Diffusion List				

Inventory of Research, Monitoring and Technological programmes and identification of the commonalities and gaps

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Summary

During the first eighteen months the ERA-Net Seas-era focused mostly on updating inventory and analysis of existing national and regional science and technology strategic plans and addressed the priorities of the partners (in general RFOs) at the pan-European and regional level.

One part of this exercise helped at informing the development of Common Programs taking into account the definition of common themes priorities to be addressed at regional levels by the major marine and maritime research components.

In parallel WP2 “Common Program”, has addressed the:

- Objectives of common programs to be built at the regional level and the different steps of the process
- Methodology, follow up of the ERA-Net MariFish and the experience gained

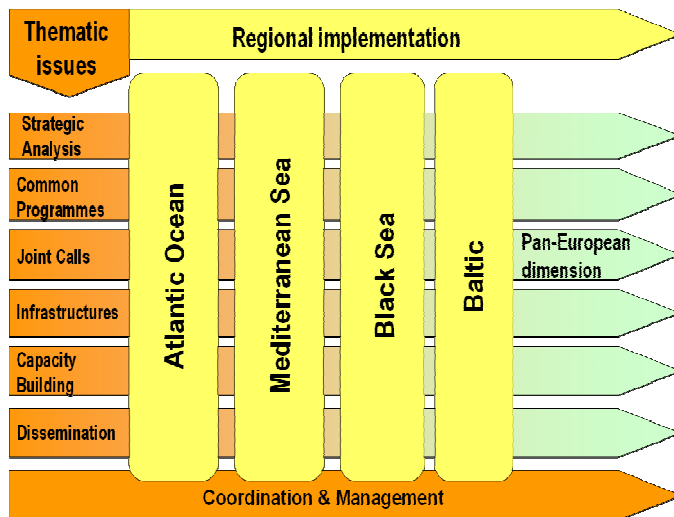
The report presents the first step of implementing Common Programs and explains how the Seas-era partners have established a broad theme to develop collaboration and selected a specific research area which would benefit from enhanced collaboration.

For the Atlantic and the Mediterranean regions, the first step of the Common programs process has been successfully achieved. The list of research themes has been discussed and negotiated to obtain a consensus for each region. The Seas-era regional partners agreed to go further in the proposal and reduce the theme with regional views and needs:

- Atlantic region: **“key physical thermo-haline circulation in North Atlantic, including the Labrador current and the Gulf Stream current”**
- Mediterranean region: **“How climate change impacts physical circulation? And consequences for the biochemistry cycle”**

Introduction

Sea-era project structure



The matrix organization of Seas-era combines thematic and regional approaches. Both components are interdependent. The transverse components (*colored orange in graph*) define strategies, develop procedures, guidelines, design approaches and ensure coordination and harmonization of work in the regions.

The three sea basin regions (the Atlantic, the Mediterranean and the Black Sea), each supported by a dedicated work package, allow for regional specificities to be addressed.

In this context the WP2 “Common Program” proposed a methodology for the implementation of Common programs in Seas-era (See report on [“General concept of the Common Programs and Guidelines for Implementing Common Programs in Seas-era”](#)) and then experienced the feasibility of their implementation in the Atlantic and the Mediterranean regions as two case studies

The similar process is underway in the Black Sea.

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The implementation of common programs at the pan-European level is not excluded. But knowing the ERA-Net ends in May 2014, the expectations were set for the three regions (sea basins). The pan-European level could perhaps be easier to implement after the success of regional approaches. As indicated in the report "General Concept of Common Program" the regional approach is well adapted for common program implementation. The consortium has decided to concentrate primarily on the efforts of regional objectives.



“General concept of the Common Programs and Guidelines for Implementing Common Programs in Seas-era” report is the first deliverable of the WP2

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The report is intended to define the concept of “Common Programs”, and also provides guidance on implementing this approach for collaboration within Seas-era, the conditions for success and explains benefits that can arise.

At this time of decreasing science budgets there is an urgent need to make maximum use of investments in research. A priority for all funders should be to explore ways combining, sharing and optimizing efforts and resources, both human and infrastructure to face the coming challenges.

Common program is cooperation among national programs already funded: The major objective is to push and align existing or planned national research programs in order to stimulate the coordination and to increase the critical masses among the major Research Performing Organizations (RPO) of the EU where appropriate and introduce more complementarity among the National Programs definition.

Building Common Programs is anyway a **new step by step approach** that requires strong commitments and also flexibility from the partners, involving ministries, funding agencies, research operators and experts. The roles of each actor must be well defined in a participative way.

The proposed general guidelines set out main stages in developing and adopting Common Programs:

- (1) **Identifying candidates** : specification by the funding agencies of their requirements and priorities for research, for Regional approaches and at pan European level,
- (2) **Refining the list and developing a work program** : identification of national existing programmes and planned programmes - develop conceptual, innovative and integrative approaches
- (3) **Formalising the collaboration** (pluri-annual MoU)

There are strong opportunities for EU instruments to develop Common research Program avoiding overlapping and increasing mutual benefits.

The results from WP1 “strategic analysis” and its ongoing process into regional research plan are relevant but not sufficient. A process further to define common research theme to develop collaboration is necessary.

Refer to the guidelines, the work performed in **Identifying candidates for common research theme to develop collaboration in Seas-era** (step 1) at regional level is described in this report

1- Strategic analysis - common programs approach must be nested in the exercise

1.1- Inventory and analysis of existing national and regional science and technology plans and strategic priorities

WP1 aims at identifying and prioritising emergent disciplinary and interdisciplinary marine scientific issues of European strategic importance. It has produced an inventory of existing national and regional marine science plans and associated strategic priorities and assisted the regional WPs in delineating the **Strategic Research Agendas**.

The Synthesis report on existing national science and technology plans and strategic priorities is finalised (**D 1.1.1**). It represents a qualitative assessment of the level of importance of the themes and science support mechanisms in the (sub)national R&D strategies. This inventory report is designed to serve as a background to SEAS-ERA partners discussion on future activities, inter alia :

- ▶ Sea basin Strategic Research Agendas and the identification and prioritisation of pressing research issues, assessed against the sea basin research landscape and policy context;
- ▶ **Common Programmes and for instance the juxtaposition of national programmes or merger of (elements of) national programmes (ref. Seas-era Workpackage 2 “Common Programmes”);**
- ▶ ...

WP1 provided a comprehensive strategic approach which presented a shared vision for the European Seas. The analysis has been achieved at a large scale for all domain of activities and foresight studies.

Following Task 1.1, each region has elaborated a Strategic Research Agenda, identifying common large thematic objectives, priorities between the Seas-era partners and a list of research themes.

WP1 provided dedicated support to the organisation of the Regional Strategic Analysis Workshops and developed a common structure for the three SEAS-ERA Sea Basin Strategic Research Agendas, bringing consistency and allowing for comparison of the resulting outputs.

Approaches to developing the SRAs differed slightly from one sea basin to another. The Atlantic SRA has been built on previous work (e.g. the FP6 MarinERA project) and be developed through a consultative process, whereas the Mediterranean SRAs has been developed by dedicated Expert Groups (with balanced representation across disciplines and countries) specifically convened for that purpose. The Black Sea SRA used a mixed approach.

In conclusion, the global reflection has been conducted by the Seas-era partners involving European and international experts contributions and regional stakeholders. Broad internal and external consultations and strategic workshops have been organized.

SRAs delivered a shared vision for the Sea bassins declined in high level objectives and a list of research themes.

1.2- Regional Strategic Research Agenda

1.2.1- List of research themes for Atlantic Sea Basin

Indicative opportunities and challenges to be addressed in the Marine Research Plan for the European Atlantic Sea Basin along with enabling actions or key research topics include:

Atlantic Sea Basin
• Ecosystem functioning and processes
• Climate Change –mitigation & adaptation
• The Deep Ocean Frontier
• Conservation and Protection of Marine Biodiversity
• Transformative and enabling technologies
• Renewable Ocean Energy
• Shipping and Maritime Transport
• Maritime Safety, Security & Surveillance
• Marine Leisure and Tourism
• Marine-BioResources: Fisheries, Aquaculture and Seafood Processing
• Hight-tech Marine knowledge -based Products & Services
• Blue Biotechnology: Harnessing Industrial Value of Sustainable Marine Biomaterials
• Oil and Gas Resources
• Mineral Resources
• The Marine Environment
• Utilising national monitoring and assessment programmes to support the research agenda
• Marine Socio-Economic Capacity building and Assessment
• Data Management and Dissemination
• Seabed Mapping

1.2.2- List of research themes for Mediterranean Sea Basin

The Strategic Research Agenda for Mediterranean Sea Basin advances research in selected priority areas:

Mediterranean Sea Basin
• Climate change and impacts
• Deep Sea Ecosystems
• Biological invasions
• Marine Pollution – MSFD
• Living Marine resources
• Ocean renewable energy
• Marine Biotechnology
• Socioeconomics & policies
• Ocean and Health
• Marine Spatial Planning (MSP) – Integrated Coastal Zone Management (ICZM)
• Natural Hazards
• Operational Oceanography (OO)

As a consequence of the foresight exercises (WP1), the implementation of Common Programs allows to identify the areas or themes which could be considered necessary to developed more cooperation.

2. National priorities – to best address common themes for collaboration

It was proposed to implement Common Program at both regional and Pan-European levels in a way that ensures the priorities and interests of all partners are taken into account.

Following the analysis of the SRAs, the Seas-era partners (National research funding agencies, Ministries, Institutions...) have been requested to establish and prioritize the list of research themes identified in the SRA.

For the Atlantic region an online questionnaire was performed for discussion of national priorities among the Atlantic members. For the Mediterranean, an approach of identifying national priorities through workshops and meetings has been proposed.

Comparing the national priorities, the analysis allowed identifying common themes considered as necessary for a collective development. Then a negotiation phase was necessary to gain a consensus on so called “selected topic” or “research area”.

All partners have jointly conducted this work. The final decision on selected “selected topic” or “research area” for common program implementation was adopted by general consensus in the region and was approved by the Steering Committee .

2.1- Identification and prioritisation– Atlantic Sea Basin

The result of the survey was presented at the Atlantic workshop 7-8 April 2011 – Paris (See table below).

Research Themes	BE	ES	FR	IE	NO	PT	IS	UK	Count	Joint call	Common program
The Deep Ocean Frontier						x			1		
Ecosystem functioning and processes	x	x	x		x		x	x	6	Mitigation of environmental impacts	
Climate Change – including mitigation / adaptive strategies, ocean acidification	x		x	x	x		x	x	6		Workshop to be arranged for more detailed info on this topic
Conservation and Protection of Marine Biodiversity	x	x				x	x		4		
Transformative and enabling technologies		x							1		
Renewable Ocean Energy				x				x	2		
Shipping and Maritime Transport									0		
Maritime Safety, Security & Surveillance									0		
Marine Leisure and Tourism									0		
Marine-BioResources: Fisheries, Aquaculture and Seafood Processing						x	x		2		
Hi-tech knowledge-based Marine Products & Services			x	x					2	New technologies for monitoring (sensors)	
Blue Biotechnology: Harnessing Industrial Value of Sustainable Marine Biomaterials			x	x					2		
Oil and Gas Resources									0		
Mineral Resources									0		
The Marine Environment	x			x	x				3	Human behavior: human capacity/impact and exchange of resources	
Utilising national monitoring and assessment programmes to support the research agenda		x						x	2		
Marine Socio-Economic Capacity building and Assessment		x			x				2	ecosystem approach and economic models	
Data Management and Dissemination	x		x					x	3		
Seabed Mapping					x	x	x		3		
Enabling Infrastructures (Task 6.4)									0		
Building Research and Innovation Capacity (Task 6.5)						x			1		

The two top priorities for collaborative programmes are:

- Ecosystem functioning and processes
- Climate Change – including mitigation/adaptive strategies, ocean acidification

For Common Programmes, the decision was to focus on Climate Change impacts.

2.2- Identification and prioritisation– Mediterranean Sea Basin

THEMES & PRIORITIES	Spain		France		Italy		Malta		Greece		Turkey		Total	
	CP	JC	CP	JC	CP	JC	CP	JC	CP	JC	CP	JC	CP	JC
1 Climate change and impacts	X	J	X		X		X		X		X	J	6	2
2 Deep Sea Ecosystems		J			X								1	1
3 Biological Invasions			X	J			X		X				4	2
4 Marine Pollution - MSFD	X		X	J							X	J	4	3
5 Living Marine resources		J			X						X			1
6 Ocean Renewable Energy					X									
7 Marine Biotechnology													1	2
8 Maritime transport & Marine Environment												J		1
9 Socioeconomics & policies														
10 Ocean and Health														1
11 Marine Spatial Planning (MSP) – Integrated Coastal Zone Management (ICZM)		J											4	1
12 Natural Hazards		J			X					J			1	2
13 Operational Oceanography / Observing Systems	X	J	X		X		X		X	J	X	J	6	3
14 Training and Infrastructures			X								X	J	2	1

CP: Climate & O.O.

JC: MSFD - O.O. / Obs

The two top priorities for collaborative programmes are:


- Climate change and impacts
- Opérational Oceanography / Observing systems

For Common Programmes, the decision was to consider the two priorities into one specific Mediterranean programme

3. Regional theme for collaboration

3.1- Identification and prioritisation– Final

The following table shows the final results of the ranking. No priorities have been identified at the pan european level.



Common projects: priorities

	Atlantic	Med	Pan-European	
Climate change and impacts		6	?	Biology/ Physics
Climate Change – including mitigation / adaptive strategies, ocean acidification	4		?	
Operational Oceanography / Observing Systems		6 (3 JC)		
Biological invasions	?	4	?	
Marine Pollution - MSFD	?	4 (3 JC)		
Marine Spatial Planning (MSP) – Integrated Coastal Zone Management (ICZM)		4		
Living Marine resources		3		

For the Atlantic and the Mediterranean regions, the first step of the Common programs process has been successfully achieved. The list of research themes has been discussed and negotiated to obtain a consensus for each region. The Seas-era regional partners agreed to go further in the proposal and reduce the theme with regional views and needs:

- Atlantic region: **“key physical thermo-haline circulation in North Atlantic, including the Labrador current and the Gulf Stream current”**
- Mediterranean region: **“How climate change impacts physical circulation? And consequences for the biochemistry cycle”**

The Seas-era consortium considers that the topics identified are fully appropriate and reflect areas where cooperation is feasible and realistic.

NB/ The other regional priorities expressed by Seas-era partners have been taken into account through a joint call launched in April, 2012 in the three following topics:

- A** Ecosystem approach and ecosystem models for the North Atlantic Ocean
- B** Risk assessment of invasive alien species - changes in marine biodiversity
- C** Development of indicators and science support and management tools for the determination of Good Environmental Status in the Mediterranean Sea

Trans-regional cooperation was highly encouraged, in particular in topics A and C, i.e. through comparative studies between the different regional approaches, comparison of methodologies and the transfer of knowledge between both regions, etc.

At the end of the call procedure, 6 projects will be funded.

3.2- Preliminary analysis of the two regional candidates.

It might be surprising that after the processes in different regions with different members countries the results of the topics of the common program are quite the same addressing the long term evolution of physical circulations and their bio-chemical consequences in relationship with climate change. There can be caused by several reasons such as:

3.2.1 The scientific relevance and importance of the research topics in relation with:

- Consequences of circulation change on geochemical cycles and biological productivity of the systems,
- Impact of the ocean circulation on future climatic evolution conditions for North European countries,
- Role of ocean in carbon assimilation,
- Impact on biological productivity,

3.2.2 The international context:

- IPCC recommendations to increase knowledge on the role of ocean interactions and to include all these interactions in the models to give more realistic scenarios of evolution of global warming at the regional level,
- The international approach is a necessity as a large number of EU members are concerned as well as North American countries,
- The long duration of the programs: long term monitoring for several decades,
- The absence of International Agreement at the state level despite some coordination under IOCCP, CLIVAR and the GO-SHIP program, and also at regional level: ICES and CIESM,
- No EU strategy and EU support for these long term research activities,
- Each country performs in isolation their own research,
- These studies cross the Atlantic or cross the Mediterranean seas are very expensive: possibility of mutual benefits of the vessel costs,
- At this time of financial crisis, many projects are in danger (OVIDES, BASIN ...) and could be withdrawn for Atlantic or not established for the Mediterranean.

3.3- Comments regarding the development of a Pan European common program

After the demonstration of the feasibility of common program at the regional level, a pan European program could be developed. Common program is a new concept which needs to be well defined and understood.

Some topics have been discussed such as climate change impacts on the functioning of the ecosystem or coordination of the implementation of the Marine Strategy Framework Directive. The MSFD includes many scientific challenges, for example developing suitable Descriptors and Indicators, and developing a better understanding of what is meant by Good Environmental Status (GES). All member states are committing funds to these areas of research and therefore it is an opportunity for the Seas-era partners to work together. At this formative stage when research needs will be identified (in relation with STAGES project), a common program will become an appropriate evidence.

As highlighted in the Guidelines report, building common programs that are effective is dependent on available fundings at adequate level for MSFD and there is still some funding issues which are still pending between the members states and the Commission in relation with the Data Collection Regulation of the DG MARE.

4. Refining the selected topic – Inventory of national programs and projects

Within workshops with experts in charge of their national programs, Seas-era WP2 is preparing the precise content of a long term monitoring program coupling physical, geochemical and biological observations to follow and to model the impact of climate change.

The two groups are refining the selected topic for the key scientific challenge from:

- An inventory and identification of existing national programs/projects and related planned programs/projects for the next years, and
- An analysis of the convergence, the gaps and the alignment of the different projects, leading to identify the contents of the Common Program.

A detailed implementation plan will be submitted soon. It appears there is an urgent need to share vessels between the countries who are interested in participating to the cross Atlantic and cross Mediterranean surveys.

The scientific communities of the EU countries have large difficulties in maintaining long term monitoring activities to follow the physical impacts and biogeochemical changes in relation with climate change. These actions are not supported by grants and proposals of the EU, and the national budget are decreasing. These research activities are in danger. The content drafting of the programmes are still underway but WP2 will urgently address the issue of the common access of large vessels for the EU scientists community (in connection with the WP4 – Infrastructure).

At this stage, the scientific argumentation is essential to convince Member States to endorse the proposed Common program and to commit them through related resources and agreement.

Conclusion

By general consensus of the funding agencies, it was decided to select as cases studies:

For Atlantic Sea Basin : Impact of climate changes in North Atlantic

For Mediterranean Sea Basin: Climate change impact on physical circulation and biogeochemical consequences

The working plan for Implementing Common Programs was the following:

Atlantic	Mediterranean	Connection with pan – European Initiative
“how to merge the different national programs and the scientific background”		
1- Reykavick experts meeting May 2012 ⇒ Deliverable 6.2.1 Pilot Common Program (M24)	1- Toulon experts meeting September 2012 ⇒ Coming deliverable 7.2.1	Infrastructure Workshop (WP4) – November 2012
2- Visio conference (France, Irland, Spain) Dec.2012		Transversal issue of the common access of large vessels for the EU scientists community

It has been decided by the Seas-era consortium that WP2 will lead and financialy support the two cases studies in relation with the regional WPs. This has changed the WP2 work plan and its Pan European commitments are postponed.

Proposed option is to work more closely with the JPI Ocean for regional common program process. The step further could be to propose the regional initiatives for a formal long-term agreement between the countries on the sharing of marine facilities (over the next 10 years).