Strategic Research and Innovation Agenda

JPI Healthy and Productive Seas and Oceans
Increase the value of national R&D investments

There is a high degree of compartmentalization in EU expending in RTD that prevents maximizing the return of the investments. Increase efficiency and effectiveness of public RTD spending through cross-border collaboration, coordination and integration of (existing) national RTD activities.
20 Participating countries
(+ Outermost regions)

Coordinating and integrating platform across disciplines and sectors

Added value:
• Increasing value of investments through improved cooperation
• Avoiding duplication
• Strategic alignment (policy measures)
• Range of tools (structural measures, pilot actions)
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pilot actions</strong></td>
<td>(3 started in 2013 + 1 in 2014)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10 Strategic Areas + 3 Cross-Cutting Areas</strong></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>I-Plan</strong></th>
<th>Implementation Plan. A menu of actions which could be taken forward in short and longer term. Endorsement by Management Board in February 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>43 Actions</strong></td>
<td>12 Cross-Cutting Initiatives + related running pilot actions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Operational Plan</strong></th>
<th>Operational Plan. Activities to be carried out in the next two years in joint actions or new pilot actions (to test mechanisms)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2015-2016</strong></td>
<td>In development Spring 2015</td>
</tr>
</tbody>
</table>
Methodology SRIA

- Research Funding Agencies/Ministries
- International Stakeholders and projects
- Open web consultation

10 Strategic Areas + 3 Cross-cutting initiatives
Deep Sea Mining
Technology Sensors
Ocean Observing Systems
Climate Change
Oceans & Human Health
Acidification
Coastal management & planning
Food Security & Safety
GES
Blue Biotech
10 Strategic Areas

1. Exploring deep sea resources
2. Technology and sensor developments (including for extreme environments)
3. Science support to coastal and maritime planning and management
4. Linking oceans, human health and wellbeing
5. Interdisciplinary research for Good Environmental Status
6. Observing, modelling and predicting oceans state and processes
7. Climate change impact on physical and biological ocean processes – Oceans circulation
8. Effects of ocean acidification on marine ecosystems: Synergies with global warming and other stressors
9. Food security and safety driving innovation in a changing world
10. Use of marine biological resources through development and application of biotechnology
Cross-Cutting Initiatives

Science-Policy Interface
Infrastructure
Human Capacity
Implementation Step–by–Step approach

- Flexibility
- Relevance
- Learning

Assessment MB & StAB Agreement of next Implementation Step

Identifying and involving Users & Producers

Agree Lead country and Expression of Interests (1 lead + 3 supporting minimum)

Factsheets from Iplan menu

Implementation Step 1

Adaptation & Implementation Step 2

Breakoff Point
JOINT FUNDING FOR THE SCIENTIFIC INTERCALIBRATION OF THE WFD COASTAL AND TRANSITIONAL WATERS

ECOLOGICAL ASPECTS OF MICRO-PLASTICS IN THE MARINE ENVIRONMENT

MULTI-USE OF INFRASTRUCTURE FOR MONITORING

ECOLOGICAL ASPECTS OF DEEP-SEA MINING

Not just about what we do but how we do it!
Intercalibration for the EU Water Framework Directive

David Cox, Belgium
Memorandum of Understanding (9 countries) + expert lead selection and contracting

Potential solution increased cost-efficiency for 2014 - 2016

1st national level
- BE
- FR
- DE
- NL
- IE
- DK
- UK
- SE
- NO
- PT
- ES

At national level about 55 environmental experts in total
- Submission monitoring data
- Follow-up IC
- Evaluation and approval to reach consensus

3rd level - international

Joint funding through JPI Oceans

At 2nd level - international Expert Leads
303.600 euro (104.000 in 2014) from environmental authorities

4 expert leads for phytoplankton & benthic invertebrates
+ 1 person JPI Oceans Secretariat

In-kind contribution from PT with 2 expert leads (seagrasses + salt marshes)

NEA GIG: 10 MS + NO:

JRC
- General coordination-facilitation
- Evaluation

OBLIGATION + RESPONSIBILITY MEMBER STATES

RESPONSIBILITY EC
Activities & new tools - Successes

- Memorandum of Understanding signed by all participating member countries
- Real common funding pot created, governed by 1 research funding body (BELSPO, Scientific and Technical Information Service).
- A first alignment of timing for budget availability obtained by 1 country for 20% of the total budget for 2014, for which an approval of shifting availability in time was needed.
- 4 + 3 expert leads contracted after a specifically designed questionnaire selection process.
- Joint financing and data compilation enabled an already long-time existing complex problem to be analysed more in-depth with independent solutions proposed.
- Very cost-efficient for countries, financially shared by all!

Activities & new tools - Difficulties

- Correct estimation of necessary man-months with feedback loop with environmental authorities.
- Different VAT certificate requirements among countries for budgets to cross boundaries.
- Time consuming training of expert leads, checks and corrections for correct translation to marine policy consequences (legally adopted environmental quality thresholds).
- Sometimes lack of sufficient calculation capacity to work with huge dataset.
- Variability of pressure data.
Outcome - Phytoplankton coastal waters

- **New milestone achieved** with chlorophyll a and nutrient data from all North-East Atlantic member countries analysed together (common fitting model obtained).
- Comparability analysis performed between legal boundaries of countries on the basis of the model that indicated how regions and countries differ from each-other.
- **Next steps**: Continuation for transitional waters

Outcome - Benthic invertebrates coastal waters

- Regional differences in behaviour of different benthic invertebrate assessment methods of 9 countries verified for the comparison of their legal boundaries.
- The comparability analysis with all countries showed that member countries have developed comparable methods with only few adjustments suggested.
- The results evaluated “+” by IC JRC review panel to include in next Commission Decision

Outcome - Benthic invertebrates transitional waters

- Hugely variable data difficult to analyse, mainly due to variability of pressure data.
- Calculation capacity not always sufficient to work efficiently with huge dataset.
- **Next steps**: continuation to find practical solution with extra analytical and training effort needed.
ECOLOGICAL ASPECTS OF MICRO-PLASTICS IN THE MARINE ENVIRONMENT
Pilot Action: Ecological aspects of Micro-plastics

Aim
- Testing the harmonisation of research methodologies and protocols for an emerging field and conducting a **first joint call** under the JPI Oceans framework.

Activities & new tools
1. Bibliometric study to map microplastics research field
2. Foresight study to identify research needs
3. International scientific experts workshop organised by Belgium, 14 - 16 January 2015, Ostend
   - Review state of science, develop best practices in methodologies and discuss steps towards a risk assessment framework
   - Report with best-practices and recommendations to be published
4. Joint call for proposals
Joint Call on Microplastics

- 10 JPI Oceans member countries (BE, DE, ES, FR, IE, IT, NL, NO, PT, SE) supported the joint call for proposals

- Thematic foci:
  - Validation and harmonisation of analytical methods (inter-laboratory study)
  - Identification and quantification of microplastics
  - Eco-toxicological effects of microplastic – impact on marine organisms

- Total allocated budget of approx. 7.5m €

- Submission deadline closed on 31 March 2015

- 170 partners in 21 joint proposals submitted, requesting 26m € of funding.
Successful Projects

4 Projects were selected for funding from December 2015:

1. BASEMAN – Defining Baselines and standards for Microplastics analyses in European Waters. Coordination: AWI, DE.

2. WEATHER-MIC: How microplastics weathering changes its transport, fate and toxicity in the marine environment. Coordination: UFZ Leipzig, DE.

3. PLASTOX – Direct and Indirect ecotoxicological impacts of microplastics and POPs on marine organisms. Coordination: SINTEF, NO.

4. EPHEMARE – Ecotoxiciological effects of microplastics on marine ecosystems. Coordination: University of Vigo, ES.

Kick-off conference in Madrid in February 2016. Let us know who is interested to receive an invitation.
Marine Litter: A priority of the G7

“We [the G7 Leaders] acknowledge that marine litter, in particular plastic litter, poses a global challenge, directly affecting marine and coastal life and ecosystems and potentially also human health.”

(Leaders’ Declaration G7 Summit, 7–8 June 2015)

“Building upon the European JPI Oceans pilot action we, the G7 partners, are reinforcing our international research cooperation and affirm that increased efforts are needed on analytical method harmonisation and eco-toxicological assessment of the effects of plastic waste in the sea, as well as potentially to our food.”

(Communiqué, Meeting of the G7 Ministers of Science, Berlin, 8-9 October 2015)
MULTI-USE OF INFRASTRUCTURES FOR MONITORING IN THE NORTH SEA
Multi-use of infrastructure in the North Sea

Background

- A better integration and international collaboration is needed to coordinate the North Sea monitoring activities, crossing national borders, as monitoring is extremely costly,
- Acknowledging the limitations in budget, maintaining the time series integrity and respecting the original goals of the programmes.

Aim

- Testing the process of designing a cross-border integrated monitoring strategy, efficiencies in data gathering by covering two policies (Common Fishery Policy and Marine Strategy Framework Directive), through competencies in different ministries.
- Focus on the extension of the International Bottom Trawl Survey (IBTS) of ICES (International Council for the Exploration of the Sea)
- Close cooperation with DG ENV project ‘New knowledge for integrated management of human activity in the sea’. The paper exercise proposed in that project requires input from the field to become aware of the obstacles to overcome and the limitations of monitoring platforms and measurement techniques. This is where the pilot action planned to play a role.
Outcomes

- The experiments at sea have resulted in some simple overviews of costs related to more integrated monitoring.
- The whole process has given an impression of issues and problems related to organising additional monitoring (funded or not from outside the regular funding for the survey), for incorporating flexible, adaptive elements to the traditional approach, allowing for the implementation of future needs as they emerge.
- The pilot action finished end 2014 - final reporting by end 2015.
PILOT ACTION:
Ecological Aspects of deep-sea mining
First Results

DE (lead country), BE, FR, IT, NL, NO, PL, PT, RO, SE, UK

- Plough tracks from 1989 can still be clearly seen.
- Disturbed areas have not been recolonised.
- Normal deep-sea life observed in close vicinity to plough marks.
- Technology for monitoring is available.

Consortium meeting on 25-27 January 2016 in Ghent.

A separate briefing for policy-makers being planned
Further cooperation

“We, the G7 Ministers of Science, acknowledge that some countries have carried out such research cooperatively under other auspices, for example through the European JPI Oceans. We encourage G7 countries that have a desire to carry out research to assess the nature and scale of the potential impacts of mining and how they would affect deep sea ecosystems, consistent with their other national priorities for oceans research.”

(Communiqué, G7 Ministers of Science, 8-9 October 2015).
Strategic Area
Interdisciplinary
Research for Good
Environmental Status
Joint Action
Ecosystem Goods and Services
Joint Action: Ecosystem Goods and Services

Support from 12 countries at Management Board meeting April 2015: FR - SE (lead countries), BE, DE, EE, ES, FR, GR, NL, NO, SE, UK

**Aim**
- to establish interdisciplinary scientific-policy partnerships and human capacity to effectively deliver robust integrated economic, natural and social scientific knowledge as policy advice for ecosystem goods and services’ based decision-making, in order to protect long-term benefits of marine (protected) areas, as needed in MSP.

**Objectives** (connectivity, research and human capacity)

1. Share best practice - e.g. in workshops present and discuss the different uses of the ecosystem approach.
2. Define how ecosystem services can, in practice, improve the assessments that lay the ground for decision making.
3. Improve the knowledge on how pressures from human activity affect different ecosystem services, both direct and indirect.
4. Investigate and conclude on the resilience of ecosystem services - how can the ESS recover after removed or diminished pressures?
Joint Action: Ecosystem Goods and Services

Progress – Summary of key activities to date

1. 1st JPI Oceans GES workshop 5 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.

2. Lead countries + their contact leads actively progressing, assisted by Secretariat

3. Develop a joint research area to integrate economic, natural and social science - find appropriate scientific critical mass to start with, linked to policy implementers

   How? Start to create the JPI Oceans Expert Group on EGS:
   - National experts to be nominated by member countries (funding agencies + government research institutions from different disciplines)
   - External experts to be selected whose experience will benefit the development of the joint action (research institutions + universities)
   - Complementary & aligned with the Member State MSFD Working Group ESA & RSCs …
   - Multidisciplinarity balance of the Expert Group to be taken into account
Joint Action
Cumulative effects of human disturbances
Joint Action: Cumulative effects of human disturbances

Support from 8 countries at Management Board meeting April 2015: NL, EE (lead countries), BE, DE, FR, EE, NO, SE

Aim

- Support managers in the decision making process on measures with regards to reaching GES, building on a network of scientists working on cumulative impact assessment.

Objectives (connectivity and research)

1. Build a **network of scientific institutes and labs working on cumulative impact assessment** and prioritize research needs in the light of management needs. Therefore, management bodies (like OSPAR and HELCOM) need to clarify the aims of cumulative effect assessment (CEA) and scientists can give research priorities (depending on management options);

2. Address the type of research questions in more detail.
Joint Action: Cumulative effects of human disturbances

Progress – Summary of key activities to date

1. 1st MSP workshop 20 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.
2. Lead countries still considering how to progress
3. Start of co-design dialogue at MSFD PCG meeting?

Research questions mentioned (JPI Oceans workshop or OSPAR science agenda)
1. defining from a multidisciplinary perspective when a change is significant, how to (jointly) monitor it and when it should trigger action by policy makers to improve the status;
2. research on different types of cumulative impacts of human activities, e.g. synergistic, antagonistic, additive;
3. development, testing and application of thresholds/targets/assessment levels usable for assessment of cumulative impacts and ultimately GES;

= not necessarily the most important questions to deal with at this moment, but it gives insight in the type of questions that should be addressed in the prioritization.
Joint Action
Integrated assessment of new pollutants
Joint Action: Integrated assessment of new pollutants

Support from 6 countries at Management Board meeting April 2015: ES (lead country), BE, DE, FR, SE, UK

Need

Member States have generally identified that better tools are required to address efficiently the monitoring and evaluation of chemical pollution especially in view of the new pollutants reaching the marine environment. The currently available effect-based assessment systems suffer from scarcity of marine, effect-study based data in general and from target matrices such as sediment and biota.

Aim

- Reinforcing the scientific basis for cost-effective integrated monitoring and assessment of - especially novel - contaminants & the pollution risk they pose.

Objectives (connectivity, research and human capacity)

Short-term:

- Connect national and most relevant regional activities into a broad interdisciplinary community through networks of people for traditional and new pollutants (science and monitoring institutions);
Joint Action: Integrated assessment of new pollutants

Objectives (connectivity, research and human capacity)

Short-term:
- Present action at meetings of potential partners to engage their experts in the groups of the joint action.
- Link with ongoing relevant EU research activities to scope their efforts and means;

Medium-term:
- Research and Innovation: Develop better cooperation of institutions in co-design with environmental authorities.

Progress – Summary of key activities to date
1. 1st JPI Oceans GES workshop 5 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.
2. Lead country identified recently (Spain)
3. Potential fine-tuning of needs with environmental authorities, OSPAR, ICES
Science Support to Coastal And Maritime Planning and Management
Joint Action: Building an Efficient Interdisciplinary Scientific Community for Policy Relevant Knowledge on MSP

Support from 9 countries at Management Board meeting April 2015:
IT (lead country), BE, FR, EE, ES, GR, NO, SE, UK

Aim
- to establish interdisciplinary scientific-policy partnerships and human capacity to effectively deliver robust scientific knowledge and policy advice for maritime spatial planning.

Objectives (connectivity, research and human capacity)
1. to create a forum, in which planners and scientific advisers to the MSP processes from local to international level can network and share experiences of best practice;
2. to develop the needed scientific knowledge base and scientific methodological advice and
3. to build human capacity.
Anticipated impact

1. Increase the academic, cross-sectorial and long-term quality of foresight exercises through a joint process to develop a vision;
2. Link methodologies for strategic planning and analytical scientific thinking to obtain synthetic analyses of appropriate quality;
3. Address priorities for new research in relation to MSP.
Joint Action: Building an Efficient Interdisciplinary Scientific Community for Policy Relevant Knowledge on MSP

Progress – Summary of key activities to date

1. 1st MSP workshop 20 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.

2. Lead country + its contact lead actively progressing, assisted by Secretariat

3. Consolidation of the JPI Oceans Expert Group on MSP:
   - National experts nominated by member countries (2/3 funding agencies + 1/3 government research institutions)
   - External experts selected whose experience will benefit the development of the joint action (research institutions + universities)
   - Complementary to the Member State Expert sub-Group on MSP of DG MARE
   - Multidisciplinarity balance of the Expert Group assessed

4. Informal discussion with DG MARE to ensure complementarity with their activities on 30 September 2015

5. Involvement of MSc student to work on the MSP Joint Action (5,2 months) to prepare 2nd workshop
“Climate change impact on physical and biological processes, ocean circulation" and "Effects of ocean acidification and warming on marine ecosystems”
Optimization of transdisciplinary marine monitoring to support assessments of the physical, chemical, biological and societal consequences of climate change (including ocean acidification)

**Aim**
This action mainly addresses the need for a coordinated European ocean observing system – building on existing national efforts, the work of GOOS/EuroGOOS, OSPAR, ICES, IOC and others - to monitor climate change impacts such as ocean warming and ocean acidification.

**Progress – Summary of key activities to date**
1. 1st workshop 24-25 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.
2. Lead country still considering how to progress
   - Implementation step 1 pending: update picture of the landscape as starting point
   - Implementation step 2 pending: engage a dialog with EuroGOOS and other relevant initiatives/ networks
Improved understanding of how climate change can affect ocean processes, ecosystems and the services they provide

Aim

This action is complementary to the previous one and mainly addresses the need to upscale experimentally-based process studies (mostly under laboratory conditions and short-term) from species-specific impacts on organisms to their consequences for ecosystems and human society, over space- and time-scales relevant to marine management and policy decisions.

Progress – Summary of key activities to date

1. 1st workshop 24-25 March 2015 factsheet outcome agreed at MB meeting 21-22 April 2015 + presented to StAB meeting on 6 May 2015.
2. Lead countries identified
   - Implementation step 1 pending: Workshops to set priority interdisciplinary science questions in climate-sensitive regions and develop transnational cooperation (2016?)