

# JPI Oceans Knowledge Hub Integrated Assessment of Effects of New Pollutants Terms of Reference

Lead countries: Spain & Norway

This document sets out the implementation of the JPI Oceans Knowledge Hub for Integrated Assessment of Effects of New Pollutants (in the marine environment) starting in 2018. The document was approved by the JPI Ocean Management Board at its 17<sup>th</sup> Meeting on 8-9 October 2018.

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## Disclaimer

This publication represents only the consolidated view of JPI Oceans and not necessarily the views of individual JPI Oceans member countries.

## Background

### **The JPI Oceans initiative and rationale for a knowledge hub**

One of the ten areas of the JPI Oceans Strategic Research and Innovation Agenda (SRIA) concerns 'Interdisciplinary Research for Good Environmental Status'. This is linked to the scientific information needs to implement environmental legislation.

The Water and Marine Strategy Framework Directives (WFD and MSFD) have established mechanisms to evaluate 'chemical quality' such as Environmental Quality Standards (EQS) for chemical hazardous substances. The 'substance by substance' approach of EQS requires a sound basis in relevant ecotoxicological data. However, even for known contaminants, sometimes assessment is very onerous due to e.g. the need to compare with very low limit values (which are based on known ecotoxicological information but also reflect uncertainty factors introduced as a safety when there is an absence of good ecotoxicological data, which is the case for marine biota). This means that a significant part of monitoring efforts is already so expensive that it often puts a break on any prospects of extending or redirecting the scope of routine monitoring. As a result, the current monitoring approaches may not address the total risk from chemical substances in a balanced way.

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-related data in general and from ecotoxicological data related to target monitoring matrices such as sediment and biota in particular.

Monitoring and evaluation methods directly based on biological effects of (certain groups of) contaminants have been elaborated in recent decades but have found relatively limited uptake in regular official monitoring programmes in Europe.

Existing integrated assessment methodologies, which aim to broaden the scope and coverage of the monitoring and assessment procedures for chemical status, are also considered to be too costly as a basis for regulatory use.

Hence there is a pressing need to improve the methodological basis for marine chemical status assessment, e.g. by focusing on increasing the efficiency of integrated assessment methodologies. In this development, scientists should at the same time pay full attention to the need to ensure that any new method can only be successful when it is accepted and trusted by society.

JPI Oceans intends to mobilize sufficient scientific critical mass to address this challenge, by:

- finding appropriate scientific critical evaluators /Principal Investigator (PI) leaders for coordination work of the joint action;
- improving the exchange of ongoing activities on ecotoxicological research with monitoring institutions;
- building human and technical capacity in ecotoxicological research;
- providing a platform for dialogue among scientists to address the question of efficiency of possible integrated methods in view of their more widespread application
- contribute so that the resulting scientific conclusions are used by environmental authorities, finally leading to adjustment of their monitoring activities.

### About knowledge hubs

Knowledge hubs are networks consisting of selected experts from JPI member countries. Each participating country is responsible for nomination and funding (in-kind and/or cash) of experts that join the network. The knowledge hub instrument aims at developing a well-balanced network of members providing all the expertise required to reach the defined goals. Each knowledge hub may have different goals, approaches and expected outcomes. However, in general a knowledge hub:

- is flexible and can address different aspects and needs of a range of stakeholders (from researchers to policymakers);
- is able to draw on existing national programs and ongoing European projects, and can concentrate on knowledge gaps;
- could leverage financial resources matching cash and in-kind contributions;
- conducts networking activities to define research gaps and challenges;
- is time-limited: it is created with specific terms of reference and ceases to exist when the parent body that created the knowledge hub considers that the work is completed or that continuation of the knowledge hub would no longer have sufficient purpose.

### Terms of Reference

The Knowledge Hub builds a network of selected research groups within a specified research area. This network will establish a critical mass of research, integration and sharing of knowledge, infrastructures, data and modelling tools, training and capacity building, in addition to improved communication and networking between the scientific community and policy makers.

### Expected Outputs

As an outcome of this networking and information exchange, the JPI Oceans Knowledge Hub will generate a report presenting the currently most appropriate methodology(-ies) for integrated assessments of effects of new pollutants, taking account of the above rationale for a knowledge hub. Further an overview of relevant improvements and refinements of existing methodology(-ies) will be given. This includes also research found necessary for improved effect/hazard studies, monitoring and sampling on the level of new and emerging pollutants. It is anticipated that a set of political, economic and social dimensions will be included as the source and impact of pollutants are utterly linked with society.

The report should provide specific recommendations to actions that can be taken by JPI Oceans

## Alignment

JPI Oceans have a separate activity on Cumulative effects of Human Activities under the strategic area of Good Environmental Status. This action seeks to navigate through the complex suite of ideas on undertaking cumulative effects assessment to consolidate thinking around a set of common agreed principles that should improve compatibility between the inputs and outputs of different methods. This should enhance usability and comparability of approaches whilst not stifling future scientific innovation to accommodate new data, evidence and techniques. This activity does hence have clear relations to the JPI Oceans activity on integrated assessment and alignment should be ensured when and where relevant.

The JPI FACCE, JPI AMR and Water JPI have activities that are related to the needs and actions of JPI Oceans on integrated assessment of effects of new pollutants. JPI Oceans will take initiative to discuss and clarify potential for cooperation on how to ensure alignment and efficient use of resources among others related to coordinated mapping of available data and research infrastructure and mapping of available databases on toxicity and hazard profile of pollutants.

There is a need to have access to all data available on marine pollutants, especially from the REACH regulation. Possibilities of sharing with the European Chemical Agency (ECHA) and REACH results of the research developed in the frame of the JPI Oceans collaborations should be identified.

## Added-Value

The knowledge hub on integrated assessment of effects of new pollutants will contribute to:

- bridging the gap (as regards application of new scientific knowledge and technological possibilities) among the scientific community as well as between the scientific and managerial communities
- fostering joint activities among scientists across various fields of science
- cooperation and collaboration across modelling communities
- facilitating access to relevant competencies for the purpose of discussing and agreeing upon (among others, and where necessary):
  - communications; type of communications will be defined based upon message provided and the receiving part.
  - definitions, example taking initiative to reach consensus on the definition of 'new pollutants', 'emerging pollutants', 'integrated assessment' etc.
  - refinement needs of the integrated assessment methodology(-ies) and their applicability in policy contexts
  - needs for mapping and access to available data on concentration and hazards
  - necessary update of input and output format of data in relevant databases to ensure a format applicable in integrated assessment
  - pilot studies for the purpose of developing and implementing methodology for characterisation of pollutants, threshold values and their hazard potential in a format that is applicable for integrated assessments
  - potential research needs
  - input to research calls that have relevance to the integrated assessment topic
  - scheme for identification, listing and mapping of new (and emerging) pollutants to ensure inclusion into relevant monitoring programmes

- Involvement of policy makers. Policy makers are the target user of the integrated assessment methodology and there is a need for early and active involvement by policy makers in the implementation and use of the methodology. There is an identified need for establishing communication lines with policy makers

## General Timeline

The work of the knowledge hub is planned for a period of 24 months. The key milestones are:

- Approval of the Terms of reference at the JPI Oceans Management Board in October 2018, together with the constitution of an initial list of participating experts by the lead and participating countries.
- The first JPI Oceans Knowledge Hub (including additional participating experts identified after the MB of October 2018) will be set up with a kick off meeting in December 2018.
- Three more meetings of experts: two during 2019 and one in the first quarter of 2020
- Draft report from the knowledge hub to be presented to the Steering Committee in April 2020
- Report from the knowledge hub to be presented at the JPI Oceans Management Board meeting in autumn 2020.
- Recommendations for further work to be presented by the Steering Committee to the JPI Oceans Management Board meeting in autumn 2020
- Final report to be produced by December 2020

## Setting up the Knowledge Hub

The knowledge hub should consist of competency and knowledge necessary to develop and implement an integrated assessment scheme. This implies that the hub should consist of both scientists as well as policy makers/management. This is due to the fact that integrated assessment among others aims to generate useful information for policy making. This implies that the representation of this knowledge hub will deviate from the general definition of knowledge hub applied by JPI Oceans.

The Hub will be the main body providing input on improvements, development needs and implementing an integrated assessment scheme. The process of improving the integrated assessment methodology will be a continuous activity. JPI Oceans will have the overall task of ensuring that the work is carried out while the knowledge hub will provide the necessary competence to ensure the quality of each phase in the process. It should be noted that the quality of input data to be applied by the integrated assessment scheme on effects of new pollutants is included in the term "methodology".

## Governance and Participation from Funding Organisations

Aug 2018 – December 2020:

Funding Organisations participating in the Knowledge Hub will compose the Steering Committee for the Knowledge Hub. The Knowledge Hub Steering Committee will oversee the activities of the Knowledge Hub and ensure their full integration in and complementarity with the overall JPI Oceans activities.

Costs associated with the Steering Committee activities (i.e. attendance at meetings, time, etc.) will be covered by the Funding Organisations of each participating country.

Funding Organisations interested in participating in this action are encouraged to confirm their commitment to JPI Oceans secretariat.

Currently the JPI Oceans secretariat noted the interest of the following countries:

Lead country: Spain & Norway

Supporting/participating countries: BE, DE, FR, SE, UK

### Selection of experts

Aug – Oct 2018:

The initial size of the knowledge hub is expected to be 30 experts:

- Interested Funding Organisations select 1-2 experts from their country, who are involved in relevant EU/national projects, or in scientific activities of regional sea conventions or national WFD/MSFD implementation, to participate in the Knowledge Hub. The selection can be done according to the preferred national procedures.
- In addition to the needed scientific expertise this action requires participation of policymakers as integrated assessment methodology aims to generate useful information for policy making and decisions. Interested funding organisations select 1-2 representatives from relevant policymaking from their country.
- Each country can nominate a maximum of three experts.
- The Knowledge Hub Steering Committee will review the proposed list of experts to be invited to join the Knowledge Hub. The review will among others take into consideration the following criteria to decide whether additional experts are needed for a well-balanced knowledge hub:
  - Researchers collaboration with stakeholders;
  - Representation of stakeholders and their areas of interest;
  - Disciplines covered.
  - Geographical balance
  - National infrastructure in place to support the group
  - Organisations and initiatives working on integrated assessments

The Knowledge Hub will be chaired by a Coordinator selected among the nominated experts (funded by one of the lead countries).

All participating funding organisations will finance the experts to attend meetings over project period, i.e. 2 meetings per year. Possible mechanisms include:

- Funding Organisation allocates additional funding to the national researchers involved or requests their national researchers reallocate a proportion of their current budget to cover Knowledge Hub-related activities.
- Funding Organisation covers the costs on a trip-by-trip basis as Expert Support in the short term.
- Meeting costs incurred in 2018 could possibly be covered partly by the CSA Oceans 2 project (Horizon 2020 Coordination and Support action) to support JPI Oceans in its implementation phase.
- Meeting costs will be covered on a rotating basis, with the host countries' funding agency covering the costs of lunch and meeting room.
- JPI Oceans will provide support via the Secretariat and publication on the JPI Oceans website.

### Invitation of experts

Aug – Oct 2018:

Knowledge Hub Steering Committee members will agree on an invitation template including the added value for experts as well as the expected activities and outputs sections in this document; and must agree on the invitation to the Kick Off meeting.

Participating funding organisations will send a confirmation to the selected experts, confirming their participation in the Knowledge Hub and the associated financial contribution they will receive for knowledge hub activities.

### Knowledge Hub Kick-Off

The Knowledge Hub Kick-Off meeting will take place in December 2018.

Expected attendees include experts invited to participate in the Knowledge Hub and the Knowledge Hub Steering Committee members.

The objectives of the meeting are to:

- ensure that participants get to know each other
- review the scope and objectives of the knowledge hub
- determine the (most useful form of) outcome(s) of the knowledge hub
- provide clarification on the processes involved, etc.
- discuss and report on State of the Art, and identify the most critical parts in need of improvement in view of the knowledge hub's objectives
- discuss and work on an implementation plan
- establish how a KH coordinator will be identified among themselves as soon as possible, preferably a nomination should be undertaken during the kick-off meeting.

### Implementation Phase

Dec 2018 – April 2019:

Within 4 months after the kick-off workshop, the experts involved in the Knowledge Hub will be requested to prepare an implementation plan, providing an indicative timeframe, outlining how they will address the expected Knowledge Hub outputs.

4 meetings will be organised over the project period of 24 months. Side meetings to already planned JPI meetings could be considered, e.g. Networking on on-going projects workshops, Mid-term review meetings, JPI Oceans Conference.

The steering committee will meet as needs arise.

### Monitoring

The Steering Committee together with the coordinator(s) will monitor the progress of the Knowledge Hub to ensure that it achieves its objectives.

## Definitions

Integrated assessment modelling (IAM) or integrated modelling (IM)<sup>[a]</sup> is a type of [scientific modelling](#) often used by the [environmental sciences](#) and [environmental policy](#) analysis. The modelling is integrated because environmental problems do not respect the borders between academic disciplines. Integrated assessment models therefore integrate knowledge from two or more domains into a single framework. Integrated modelling is referred to as assessment because the activity aims to generate useful information for policy making, rather than to advance knowledge for knowledge's sake. Integrated assessment modelling is that part of integrated assessment that relies on the use of numerical models.

Notable centers of integrated assessment modelling are [IIASA](#), [MIT](#), [Netherlands Environmental Assessment Agency](#), and [International Futures](#).

COMMISSION DECISION (EU) 2017/848 of 17 May 2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU (Text with EEA relevance)

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017D0848&from=ES>

NORMAN definition of emerging pollutants:

**“Emerging pollutants”** can be defined as pollutants that are currently not included in routine monitoring programmes at the European level and which may be candidates for future regulation, depending on research on their (eco)toxicity, potential health effects and public perception and on monitoring data regarding their occurrence in the various environmental compartments.

<http://www.norman-network.net/?q=node/19>

The term ‘pollutant’ is equivalent to that of a contaminant that can appear in environmental concentrations leading to pollution effects. Use of the term ‘pollutant’ does not imply existence of actual pollution by that substance.



## Appendix

The following is a list of activities of the JPI Oceans Knowledge Hub which will be carried out to the extent required to reach the objectives:

### **Identification of integrated assessment methodology**

The first major task of the knowledge hub will be to identify, from literature and known case studies, the most appropriate integrated assessment methodology(-ies) present today for the purpose of testing. In selecting methodology(-ies), the factors determining their compatibility with regulatory context(s), or their potential other benefits/costs, will be discussed.

### **Definition of input data to be applied in the integrated assessment methodology**

The next major task for the knowledge hub will be to identify necessary input data and their sources to be able to run the integrated assessment methodology(-ies), such as:

- a) description of necessary work/study that must be undertaken to ensure that a methodology for characterisation of pollutants, threshold values and their hazard potential in a format that is applicable for integrated assessments is developed and implemented
- b) description of statistical requirements in relation to management of uncertainty (related to all main sources of uncertainty, such as natural variability and analytical error) and depending on the intended use of the integrated assessment method (e.g. determination of relative risk, of trends, ...)
- c) design of other long-term monitoring and mapping programme requirements in relation to ensuring necessary data quantity and quality on sources, hazards, concentrations of new pollutants. Increase of collaborative and targeted monitoring efforts in Marine Strategy Framework Directive and Water Framework Directive contexts should be aimed for.
- d) development and implementation of new techniques for the analysis of marine emerging pollutants, as e.g. target screening

### **Identify users of the integrated assessment methodology**

In this process, the knowledge hub will identify and establish contact with the potential users of the methodology and the output thereof and aim at their involvement at useful stages during the work of the knowledge hub.

### **Identify test sites/regions**

Identify test sites/regions (geographical spread) for the purpose of implementing the test scheme of the methodology(-ies).

### **Identify refinement needs of the integrated assessment methodology(-ies)**

- a. Promote pilot studies for
  - i. defining criteria for identification of key species (biological)
  - ii. actual identification of key species applying the defined criteria

- iii. implementation of key species principle into the integrated assessment scheme
- b. Promote pilot studies for the purpose of inclusion of risk assessment into the IA methodology(-ies).
  - i. defining acceptance criteria
  - ii. setting up a risk-based principle in the IA methodology
- c. Identify potential research activities that will benefit from the development, application and quality of the integrated assessment methodology of effects of new pollutants. This includes also research found necessary for improved effect/hazard studies, monitoring and sampling on the level of new and emerging pollutants.
- d. contribute so that the political, economic and social dimensions are included in the research of emerging pollutants as the source and impact of these pollutants are utterly linked with society.

**Recommendations further work**

Provide recommendations for further actions on integrated assessments, specifying which actions JPI Oceans may take a leading position.

Provide specific recommendations to the JPI Oceans activity on cumulative effects.