

**Title joint action:** Cumulative effects of human activities

**SRIA strategic area:** Interdisciplinary Research for Good Environmental Status

**Lead country:** Presently Norway

**Responsible MB member:** Hanna Behrens (N)

**Contact leads for joint action:** Inger Oline Røsvik

**Supporting countries:** BE, DE, EE, FR, IS, IT and NO

**Required resources:**

## BACKGROUND – STATE OF PLAY

One of the ten areas of the JPI Oceans Strategic Research and Innovation Agenda (2015-2020) concerns 'Interdisciplinary Research for Good Environmental Status', where cumulative effects of human activities are one of the activities. Our ability to protect ocean health can be increased by extending our knowledge about **current and emerging environmental pressures** such as **pollution, overexploitation and climate change** and their impacts across longer timescales, broader geographic scales, and all essential ecosystem components. Further key improvements can come from improving the tools for assessing the environmental impacts of pressures and the efficiency and socio-economic impact of measures to their reduction or elimination. This is even more essential when put in the context of **cumulative effects assessments** where the interactions between multiple activities, pressures and ecosystem components are investigated in a systemic way. (JPI Oceans Strategic Research and Innovation Agenda 2021).

Cumulative effects assessments (CEA) are holistic evaluations of the combined effects of human activities and natural processes on the environment in a defined area. The understanding of cumulative effects (synergistic, antagonistic and/or additive effects) and how to manage the causal human activities and pressures are still underdeveloped.

Notwithstanding the scientific challenges, different European directives (EIA, SEA, MSFD, WFD & Habitats directive) recommend or require a type of cumulative effects assessment (CEA). According to these directives, it is expected that responsible authorities make a CEA before allowing new activity in an area. At sea, this would apply to expansion of ports, road embankments and new bridges, new sites for aquaculture, the establishment of wind turbines and so on. European authorities/policy makers at all levels often make decisions that require a CEA, and the countries have dealt with this in different ways.

There is a great demand for a common handbook/ procedure for how to implement a CEA. The development of such a guideline must be based on current research, and act as an ABC for users in how to proceed to create a CEA. This is a task that is very suitable for working across national borders and where JPI Oceans can make a special contribution.

## Previous activity

The preparations for the activity started in 2016, and in April 2017 a workshop was held in Utrecht with the objective to draw up a roadmap on cumulative effects of human activities. In January 2018 the JPI Oceans Management Board adopted the roadmap and decided to set up a Knowledge Hub.

Knowledge hubs are networks consisting of experts/ knowledgeable people from the JPI Oceans member countries. Each participating country nominates and funds (in-kind and/or cash) their experts that join the network. The knowledge hub instrument aims at developing a well-balanced network of members providing necessary expertise/ knowledge required to reach a defined goal.

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## REVISED TERMS OF REFERENCE

The main objective of this activity is to **develop guidelines and common principles on how to assess cumulative effects of human activities**, and this will be the task that the knowledge hub will deliver on. Target groups for the guidelines are authorities/policy makers who frequently take decisions/ give permits expected to be based on CEA's, and scientists who need this tool for further research.

Participating JPI Oceans member countries have nominated experts who can form a knowledge hub for this task.

In this document, the definition of cumulative effects assessment is based on a definition outlined by Judd et al. (2015) with some adjustments in bold:

*“Cumulative effects assessment (CEA) is a systematic procedure for identifying and evaluating the significance of effects from multiple **natural and non-natural** pressures and/or activities on single or multiple receptors. CEA provides management options, by quantifying the overall expected effect caused by multiple pressures and by identifying critical pressures or pressure combinations and vulnerable receptors.”<sup>1</sup>*

### In its work with guidelines the knowledge hub should consider the following:

- Common understanding of CEA, what it is for and the needs of variability and flexibility
- Level and quantity of data, how to utilize available data, harmonization and use of metadata. What if there is almost no data?
- Utilizing existing data sources
- Use of knowledge/ experience from locals, experts, and stakeholders
- Consider the large variation in areas in terms of properties, access to data and complexity
- Transparency and documentation,
- Identify relevant effects/pressures, how to characterize and separate different pressures and single out dominant pressures, identify non-additive combined effects (synergy, antagonism), assess the consequences of omitting some pressures

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<sup>1</sup> A.D. Judd et al. / Environmental Science & Policy 54 (2015) 254–262 255

- How to apply risk assessment principles to understand and prioritize basic pressure-state interactions (and gaps)
- Evaluate the robustness of CEA results considering level of data, knowledge gaps and associated uncertainties
- Develop a framework for combining results from the above

### **Expected output of the action**

The Knowledge Hub is expected to generate a short report with suggestions to a guideline/ procedure targeting decision makers at all levels on how to assess cumulative effects of human activities. The report should provide specific recommendations on actions that can be taken by JPI Oceans to follow up the work, including knowledge gap importance for assessing CEA.

### **Alignment**

JPI Oceans knowledge hub on Integrated Assessment of Effects of New Pollutants (in the marine environment) finalised its work in 2020. The policy brief from this is relevant to the JPI Oceans activity on Cumulative effects of human activities and alignment should be ensured.

In 2020 the International Council for the Exploration of the Sea (ICES) created a new working group on Cumulative Effects Assessment Approaches in Management (CEAM), that will review existing guidance and approaches to develop a CEA framework that could provide practical advice in the development of management measures which would be better aligned with operational management and regulatory processes. This will include to *produce generic guidance on data and knowledge needs for CEA's including using qualitative and quantitative data, accommodating uncertainty, identifying information gaps based on the application of the framework in the above case studies.* ". Alignment between the JPI Oceans activity and the work of ICES must be ensured.

There will most likely be a Horizon Europe call on Cumulative Effects Assessments with the HORIZON-CL6-2021-BIODIV-01-04 on "Assess and predict integrated impacts of cumulative direct and indirect stressors on coastal and marine biodiversity, ecosystems and their services". There could be some overlap with the Knowledge Hub, but with a call in spring 2021, the projects will only be launched in spring 2022, with the earliest deliverables some time in 2023.

Assessing CEA is relevant for other Joint Actions of JPI Oceans (i.e., Aquatic pollutants, Plastics, S4GES, Integrated pollution, Noise). It could be worthwhile to explore or establish a high-level discussion to streamline the activities of these efforts to avoid duplications. This will be followed up by the JPI Oceans secretariat.

### **General Timeline**

The initial timeline of the work indicates a total duration of 24 months, with six working meetings (2-3 days physical meetings). However, the Covid19 pandemic is a major element of uncertainty and will affect the possibility to have physical meetings as well as potentially expanding the timeline of the work.

The key milestones are:

- Approval of the Terms of Reference at the JPI Oceans Management Board meeting in May 2021,
- Kick-off meeting in September 2021,

- Frequent meetings in the knowledge hub through 2021/ 2022/ 2023
- Draft report from the knowledge hub to be presented to the Steering Committee of the knowledge hub in spring 2023
- Report from the knowledge hub with a suggested guideline/ procedure on how to make CEA will be presented at the JPI Oceans Management Board meeting in autumn 2023.
- Recommendations for further work to be presented by the Steering Committee to the JPI Oceans Management Board meeting in autumn 2023
- Final report to be produced by December 2023

### Kick-off meeting

The objectives of this first meeting in the knowledge hub are to:

- Get to know each other
- Provide clarification on the processes, timeline, key milestones, etc.
- Discuss and report on State of the Art,
- Setting up a working plan
- Nominate coordinator and co-coordinator for the knowledge hub.

### **Knowledge Hub**

Following experts are presently nominated from the participating countries:

Name	Country	Institution	Expertise
<b>Thomas Kerkhove</b>	Belgium	Royal Belgian Institute of Natural Sciences (RBINS)	Marine multi-use, developing assessment frameworks for (environmental) impacts.
<b>Bob Rumes</b>	Belgium	Royal Belgian Institute of Natural Sciences (RBINS)	Marine ecologist, environmental impact assessment and management of marine renewables, is in the CEAF group working on common CEA tools.
<b>Rene Reisner</b>	Estonia	Ministry of the Environment of Estonia	Marine department in ministry, implementation of marine policy, MSP, care about regional and international level.
<b>Daniela Zeppilli</b>	France	Ifremer	Animals in sediment, impact on deep sea, related to oil and gas inspections, part of JA Mining impact.
<b>Jozée Sarrazin</b>	France	Ifremer	Deep sea ecologist, hydrothermal vents, understand the impact of mining on those communities.
<b>Benjamin Kürten</b>	Germany	Project Management Juelich (PtJ), Juelich Research Centre GmbH	Working at funding agency on behalf of the ministry, is in the JPI Oceans MB, ecosystem analyst for biogeochemical effects.
<b>Sóley Morthens</b>	Iceland	Marine and Freshwater Research Institute	
<b>Laura Canesi</b>	Italy	University of Genova	Environmental physiologist, model different environmental stressors.
<b>Donata Canu</b>	Italy	National Institute of Oceanography and	Marine ecosystems modelling addressing the effect of anthropogenic and natural drivers on ecosystems.

		Applied Geophysics (OGS)	
<b>Øystein Leiknes</b>	Norway	Norwegian Environment Agency	Marine management plans, which methods to use, OSPAR
<b>Ketil Hylland</b>	Norway	Department of Biosciences, University of Oslo	Marine ecologist and toxicology. Worked with effects of human activity on marine ecosystems in various contexts, both as research questions and as a member and chair of international working groups.

The knowledge hub is expected to invite external expertise into the discussions when relevant.

## **Governance and Participation from Funding Organisations**

### Steering committee

One representative from each funding Organisation participating in the Knowledge Hub will be represented in the Steering Committee. The Steering Committee will oversee the activities of the Knowledge Hub and ensure their full integration in and complementarity with the overall JPI Oceans activities.

### Knowledge hub

The Knowledge Hub will be chaired by a Coordinator selected among the nominated experts. In addition, a co-coordinator will be selected to support the coordinator in their work.

## **Funding mechanisms of the knowledge hub**

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. The steering group will be led by Norway and in addition be represented by expertise from BE, DE, EE, FR, IS and IT.

Participating countries covers the cost of their national experts according to national rules etc out for the participation in the knowledge HUB.

Meeting costs will be covered on a rotating basis, subject to availability, 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.

Funding of direct costs of specially invited external expertise from other countries than those involved in the knowledge HUB must be clarified prior to invitation. Costs can either be covered by one or more of the attending countries or by the JPI Oceans secretariat.