



Norwegian University of
Science and Technology



National Research
Council of Italy

NTNU-CNR Webinar

Towards a Mission on Healthy Oceans:
State of implementation and ways to improve stakeholders
engagement

Bruxelles
23.06.2020



Event rationale

As stated in the [Horizon Europe](#) framework, humankind is facing grand challenges. These global threats require a paradigmatic shift in the way solutions are developed and implemented. To achieve a sustainable future, extensive efforts must be taken. In such a scenario, research and innovation will play an imperative role.

Horizon Europe has introduced the concept of **Missions** to identify and to implement specific objectives that has to be clearly measurable and achievable. The Mission “**Healthy Oceans, Seas, Coastal and Inland Waters**” (Oceans) addresses a highly complex system. To ensure that *"by 2030 the potential of oceans, seas and inland waters, their ecosystems and bio-economies to drive a healthy planet is fully understood, unlocked and harnessed"* the impact of investment must be maximized, and the objectives must be focused and feasible.

In view of facilitating the work of the Mission Board Oceans and in structuring the process to tackle its challenges, a debate among Institutions and Research Organizations at the European level has been promoted. Many well-recognized researchers from a variety of European Institutions (Helmholtz, CNRS, CNR, NTNU, INFREMER, UPTec, University of Plymouth) have been involved to provide a **reflection paper** to identify key aspects of consideration for the Mission. The results were presented at the 4th NTNU conference in Brussels on **10th October 2019**, and transmitted to the Mission Board. The reflection paper addresses 10 aspects to reflect when shaping the Mission through combining knowledge and technology with business models, finance, regulatory aspects, governance, skills and social innovation. The experts proposed to focus on the interlinked system between the marine and terrestrial ones, in a truly integrated vision towards a **Good Planetary Status**. **Pollution and Food Production** being the main focus targets, within a closed cycle involving environment, human activities and policy decisions.

In the spirit of co-creation and co-design, the experts involved in the first reflection paper have been further challenged to focus their dialogue towards the definition of a concrete proposal coherent with the Mission’s requirements. The proposal has resulted in a new **input paper**, which aims to be an ingredient in the wide diversity of aspects, which Mission Oceans will be asked to address. This new input proposes to develop a network of aquaculture production sites where fish farmers, researchers and citizens work together to observe the sea, process the data and provide freely available information that will benefit all marine data users.

The proposed Webinar with representatives of the Mission Board Ocean, the Commission and relevant stakeholders in marine and maritime sectors will represent the opportunity to present the input paper and debate on the evolution of the Mission and the expected timeline for it.

NTNU-CNR Webinar

23.06.2020, 10:00 – 12:00

Towards a Mission on Healthy Oceans - Citizen engagement in monitoring marine ecosystems through aquaculture sites

Agenda

10:00 **Massimo Busuoli** (Director, NTNU Brussels Office) – Welcome & meeting instructions

Bjarne Foss (Pro-Rector for Research, NTNU) – Opening address

10:10 **Minna Wilkki** (Head of Missions & Partnerships Unit, DG Research and Innovation, European Commission) – The expected role of Missions in Horizon Europe.

10:25 **Sigi Gruber** (Head of the Healthy Oceans & Seas Unit, DG Research and Innovation, European Commission) - Towards a Horizon Europe Mission on Oceans, Seas, Coastal and Inland Waters

10:40 **Gesine Meissner** (Member of the Mission Board Oceans) -
The state of the EU Mission Board on Oceans

10:55 **Siri Granum Carson** (Director, NTNU Ocean) - “Network of nets”

11:10 Panel short additional interventions (5 min each):

- **Mario Sprovieri** (CNR)
- **Alexandra Neyts** (General Secretary, EATIP)
- **Arvid Hallén** (Chair of the Management Board, JPI Ocean)
- **Inga Lips** (Secretary General, EuroGOOS)

11:35 **Open debate**

The event is organized by

Network of nets: fish farms, researchers and citizens connected for ocean health

Input paper for the attention of the Healthy Oceans, Seas, Coastal and Inland Waters Mission Board.

The goal:

The objective is to better deploy the current instruments and monitoring routines at existing aquaculture production sites, to improve their monitoring capabilities by implementing new technologies and to advance knowledge exchange. Intensified observations contribute to a better understanding of the interaction between the marine ecosystem and the aquaculture sites aiming at providing healthy fish, a sustainable marine culture industry and protecting the environment.

- Develop techniques and procedures for quantification of environmental and ecological services provided by aquaculture farms and encourage voluntary farmer-based contributions to environmental management.
- Stimulate aquaculture activities that both provide nutrition safety and security as well as become a tool for gathering data in order to improve monitoring of the condition of the aquatic ecosystem.

The focus:

Promoting a system where fish farmers, researchers and citizens work together to observe the sea, process the data according to international standards and provide freely available information that will benefit all marine data users. Two of the main objectives of the UN Decade of Ocean Science for Sustainable Development are a comprehensive ocean observing system and a quantitative understanding of ocean ecosystems and their functioning, as well as how aquaculture production sites can contribute to reaching these goals in collaboration with researchers and citizens.

The deliverables:

- Knowledge-based aquaculture plants acting as augmented observatories of ocean health.
- Observations from the aqua pollutants as well as the biodiversity perspective.
- Services for and from the citizens and industry. Monitoring systems promote ocean health, while providing possibilities for improving fish health and, thus, productivity.

Starting from evidence and capacities:

Healthy nutrition from marine food can be provided by aquaculture, in a balanced and complementary collaboration with fisheries, using aquaculture as a resource to relieve the seas from pressure through wild catches and in some cases contribute to rebuild fish stocks.

The concept of “low impact” or “zero-waste” aquaculture has already been developed but the aim should be to develop it further towards a “net positive” aquaculture with a high level of circularity where the net impact on the ecosystem is positive rather than neutral. Synergies with EuroGOOS, EMODnet, Copernicus Marine systems will be structured to provide integrated observations, services and apps for the involvement of citizens in co-creation of solutions and behaviour transformation in approaching the oceans and its resources.

Challenges:

In tune with challenges offered by the Oceans and the combination with human marine-culture activities, our vision should deviate from a product maximizing focus to a health/environmental/climate focus where low-trophic seafood industry, that contribute to carbon sequestration and eutrophication mitigation, is promoted. Impacts of pollutants on the ecosystem (such as PCBs, dioxins, pesticides, antibiotics, microplastics....) and mitigation/remediation measures need to be prioritized, in terms of health analysis and understanding the base line in the monitoring of aquaculture platforms. Careful monitoring is essential for understanding the functioning of the systems, develop assessment methods, and support well-functioning ecosystem services.

Fulfilling the “mission” indicators:

The main characteristics of mission-oriented research and innovation, as publicized by the commission are:

- **Bold, inspirational, with wide societal relevance;**

In history, the transition from hunting on land to breeding has introduced a drastic change in human activities, social and economic development. The transformation of marine food production into one which is dominated by aquaculture has huge impact as well. The idea of restoring the marine ecosystem, now impacted by overfishing and pollution, and promoting a sustainable and environmentally sound global aquaculture-based production system, based on thorough research and ethical considerations, is a bold but feasible objective to reach for.

- **Targeted, measurable, and time-bound;**

The objective is to develop technologies and to advance knowledge in a network of aquaculture infrastructures, which can contribute to an intensified level of monitoring in the marine ecosystem, aiming at providing healthy fish and protecting the environment. The increase of quality of the fish and of the waters can be measured. A network of test facilities

can be completed in few years, while implementing the system at a global level - given proper regulation - is a goal that can be reach in a couple of decades.

- **Ambitious, but realistic R&I actions;**

The aquaculture industry is resourceful and already using a number of monitoring devices to control production, animal health, and welfare and environmental interactions at a local level. The challenge is to scale up and integrate into a regional level, and to understand the complexity of the interaction between the cumulative effects of different pressures on the environmental status of the oceans and the planet. This is partially addressed already by the Marine Strategy Framework Directive and by the Maritime Spatial Planning Directive. The scientific community is already aware of the gaps and paths to be adopted to provide useful contribution towards the solutions.

- **Cross-disciplinary, cross-sectoral and cross-actor innovation;**

Understanding the complexity of the ecosystem consisting in the links between human activities and the environment, including the economic and social aspects, is *per-se* a multi and cross-disciplinary issue. A multitude and diversity of sectors and stakeholders are involved, from the traditional aquaculture sector to those addressing ICT, robotics, remote sensing, materials, energy, transport, medicine, governance/political science, environmental ethics etc. This includes also an improved knowledge of seafloor and coastal morphology through time-lapsed bathymetric surveys as well the knowledge of oceanographic processes that can disperse pollutants from or into aquaculture farms.

- **Drive multiple, bottom-up solutions;**

Some current solutions are promising: Upscaling the sequestration potential of aquaculture through seaweed and shellfish aquaculture; Increase the circularity of the aquaculture value chain (i.e.: production of fish meal and fish oil from waste streams); Switching from non-sustainable land-based sources of protein (such as soy production which in some areas have a destructive effect on the rain forest) to new feed compounds from low carbon ocean-based sources through aquaculture (to avoid overexploitation of ocean biomass). In addition, further exploring and developing other bottom-up solutions like the contribution of big data and artificial intelligence in understanding the functioning of the ecosystem, as well as of the use of new materials and development of automation can drastically impact on possible unprecedented solutions based on cross-fertilization from different innovations.


This document is the result of a collaborative reasoning of the following experts and would like to represent a contribution to the current on-going definition process for the Healthy oceans, seas, coastal and inland waters Mission of Horizon Europe.

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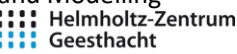
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