JPI Oceans Knowledge Hub
European Marinas Network

Terms of Reference
Date: September 2025

Lead country: Greece and Italy
Supporting/participating countries: Germany and Croatia, Greece and Italy

This document sets out the implementation of the JPI Oceans Knowledge Hub on the European Marinas Network starting in January 2025. The document presents the procedure for setting up this action and serves as the Terms of Reference, meaning it defines the purpose, scope, structure, and responsibilities that guide the establishment and operation of the Knowledge Hub.

Contents

The JPI Oceans initiative and rationale for a Knowledge Hub

European waters count at least 6 million boats and over 6,000 inland and coastal marinas, which makes the recreational boating industry a significant contributor to the global blue economy and environmental dynamics (Alkhalidi and Alsulaili 2024; European Boating Industry). Although different census methods may not always align, resulting in contrasting numbers of marinas, in Italy alone over 500 marinas and small ports operate, while Greece counts for 100 circa (Bruccoleri et al., 2023; Assomarinas, 2024). Marina companies operate in an increasingly competitive environment, where environmental impact becomes a unique point of sale criterion and can be considered as an indicator for the effectiveness of promotional strategies of the sector (Bruccoleri et al., 2023).

In addition, marinas act as positive catalysts for their environment providing space for local companies and being providers of access to seas and waters while activating citizens' ocean literacy and environmental awareness. A broader scope of this initiative is to transform the perception of marinas from exclusive spaces for the well-off to accessible hubs for science, where society can engage with ocean science and environmental monitoring. This shift in perception will benefit marina operators by enhancing their community value while contributing to scientific understanding of coastal environments and connected threats.

However, marinas and small ports with high boat traffic can also put pressure on their ambient aquatic systems, e.g. from direct release of contaminants from the boats or indirectly through their activities (Gaines, 2023; Amorim et al., 2024). It is noteworthy that the environmental assessment in marinas has revealed significant differences among them, evidencing the importance of the monitoring and of the collection of qualitative and quantitative data on which to base site-specific management guidelines (Guerra-García et al., 2021). To make the boating sector fit for the future, marinas and their stakeholders generally seek to improve their environmental performance. Therefore, environmental quality assessment of marinas is becoming a high priority issue. They have an intrinsic interest in protecting their surrounding waters and marine biodiversity being an element of attractiveness for nature lovers, watersports, other activities and tourist purposes in general. Other motivations to engage with research and innovation can include marina certifications, resilience to extreme events, adaptation to sea-level rise, synoptic data for better weather information, and community engagement to attract more customers.

Monitoring the marine environment inside and outside marinas is crucial for better management and sustainability, promoting sustainable use of the marine environment and data collection in the frame of the EU legislation (EU, 2000; 2018). While marinas can exert pressure on aquatic systems through boat traffic and human related activities, they also serve as positive catalysts for their surroundings, as their infrastructure provides an exceptional foundation for establishing ocean observing systems at key coastal points where environmental data is often lacking. This positioning makes marinas strategic candidates for cost-effective deployment of monitoring technologies to address significant data gaps in coastal and nearshore environments. This infrastructure-based approach offers scalable solutions for ocean observing to address data deficiencies and promote sustainable practices within the marina sector. A significant research challenge exists as satellite measurements cannot effectively capture all coastal data, where marinas are located, creating blind spots in coastal monitoring systems. The European Marinas Network addresses this gap by establishing *in-situ* monitoring from marina

facilities, leveraging pre-established coastal infrastructure to provide valuable data that complement existing observation systems.

Main objectives

The Knowledge Hub will focus on developing a data-based understanding of socio-environmental conditions within and around marinas in Europe by:

- Establishing a network of selected marinas to participate in coordinated and synergic environmental monitoring and data collection
- Developing guidelines for marinas on using standardised, low-cost sensor packages to measure oceanographic and environmental variables
- Promoting and enabling marinas to become focal points for harmonised data generation and collection

Complementary objectives

The Knowledge Hub will also pursue complementary objectives in education and science-policy impact:

- **Education and engagement:**
  - Engaging marina users in environmental monitoring and data collection activities
  - Strengthening awareness on the environmental issues and promoting a citizen science approach, including educational resources to increase ocean literacy
  - Establish knowledge-sharing platforms for sustainability best practices amongst marina users
- **Policy impact:**
  - Supporting implementation of EU directives such as the Water Framework Directive (WFD) and the Marine Strategy Framework Directive (MSFD)
  - Serving as validation partner for scientific initiatives, e.g. European Earth Observation Missions and upcoming relevant EU Horizon projects
  - Providing data useful for maritime spatial planning and sustainable coastal management

About Knowledge Hubs

Knowledge Hubs are temporary networks consisting of selected experts from JPI Oceans member countries with the goal of delivering a specific outcome or product, or several thereof. 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);
- can draw on existing national programmes 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.

The Knowledge Hub builds a network of selected experts within a specified research area. It 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.

The Knowledge Hub on the European Marinas is a joint effort by Greece and Italy supported by Germany, and Croatia, following the priorities set out within the 'Ocean Health' and 'Ocean Stewardship & Governance' components of the JPI Oceans Strategy Framework. The Knowledge Hub on European Marinas focuses on developing novel infrastructure for the monitoring of the marine environment inside and outside marinas and data generation, to develop a data-based understanding of the socio-environmental conditions within and around marinas in Europe. It aims to support the development and implementation of related policies at local, national and European level by providing a networking platform to promote exchange, synthesis, integration and generation of knowledge.

Expected Outcomes

As an outcome of this networking and information exchange, the JPI Oceans Knowledge Hub aims to establish and deliver:

- An operational network of minimum 12 pilot marinas' monitoring stations (minimum 3 per Country participating in the Joint Action)
- Standardised protocols for sensor deployment, maintenance, calibration and data collection in marinas' environments
- An operational real-time data visualisation tool
- An operational data repository integrated with EMODnet
- A "Marinas for Science" recognition system for participating facilities
- Educational materials to enhance capacity amongst marina operators and users in scientific data collection and ocean literacy
- Policy impact event, for instance a hackathon for data usage or visualisation, if applicable with a focus on business model development.

Alignment

JPI Oceans can ensure engagement with the quadruple helix model through cooperation of its members and ongoing Joint Actions.

Added-Value

The added value of this Knowledge Hub consists in:

- Leveraging marinas as a unique and underutilised resource for ocean science and sustainability
- Empowering marinas to become hubs for citizen science and community engagement in environmental monitoring and data collection
- Establishing a scalable model for coordinating environmental data collection and knowledge-sharing across a diverse network of coastal sites
- Fostering synergies and cross-pollination of ideas between the marina industry, research institutions, and policymakers
- Supporting marinas in understanding their impact and improving environmental performance

General Timeline

The Knowledge Hub is planned for an initial period of 4 years.

The key milestones are:

- **Phase 1:**
  - **Pilot preparation (Sep–Dec 2025).** Finalise governance and initiative recognition, MoUs, nominate expert group leads, begin sensor procurement.
  - **Pilot Deployment & evaluation (Jan–Dec 2026).** Install initial sensors, test data flows, early outputs.
  - **Expansion & repeat of the pilot phase (Jan–Dec 2027).** Involve more marinas, refine process, expand dissemination.
- **Phase 2: Consolidation & outputs (Jan–Dec 2028)**
  - Scale up across more marinas and type of data collected.
  - Long-term integration, policy alignment, final reporting, handover.

Governance and Participation from Funding Organisations

Governing structure

JPI Oceans Management Board members participating in the Knowledge Hub will compose the **Steering Committee** for the Knowledge Hub (Greece, Italy, Germany and Croatia). 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. The Steering Committee will be chaired by the Management Board members (or someone they designate) of the lead countries (Greece and Italy).

A **coordination unit** composed by representatives of lead countries and co-coordinators from the JPI Oceans secretariat will have day-to-day responsibility for the work of the Knowledge Hub.

An **expert group** will be selected to work towards the outcomes for the Knowledge Hub as outlined in these Terms of Reference. This group will be chaired by a scientific lead or co-leads, nominated by the expert group and approved by the Steering Committee. The expert group will be divided into three dedicated task groups:

- Task Group 1 on Marina network development
- Task Group 2 on Sensor deployment and data collection
- Task Group 3 on Data management and dissemination

Setting up the Knowledge Hub

JPI Oceans will have the overall responsibility of ensuring that the work of the Knowledge Hub is carried out while the Knowledge Hub experts will provide the necessary competence to ensure the quality of each phase in the process. The Knowledge Hub experts will be the main body for executing the work set out and agreed for the Knowledge Hub and should consist of the competence and knowledge necessary to be able to deliver the expected outputs as laid out in the Terms of Reference.

Selection of experts

The relevant competencies necessary to execute the work of the Knowledge Hub include marina operators, solution providers, multi-disciplinary scientists that can oversee monitoring, and other relevant parties.

The Knowledge Hub Steering Committee members will agree on a process and criteria for expert selection, thereby also considering the expected activities and outputs sections in this document.

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
- Gender balance
- National infrastructure in place to support the group
- Organisations and initiatives working on integrated assessments

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 took take place on 5 February 2025. Attendees included experts invited to participate in the Knowledge Hub and the Knowledge Hub Steering Committee members.

The objectives of the meeting were 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 work on implementation milestones.
- Agree on the governing structure

Implementation Plan

After the kick-off meeting, the experts involved in the Knowledge Hub will be requested to develop implementation milestones with an indicative timeframe and tasks, outlining how they will address the expected Knowledge Hub outputs. During this time frame, working groups will be established.

Monitoring

The Steering Committee together with the coordinator(s) will monitor the progress of the Knowledge Hub to ensure that it achieves its objectives. This will be done through regular meetings to discuss the status of each of the expected outputs laid out in the Terms of Reference.

Budget and funding mechanisms

Costs associated with the Steering Committee's own activities (i.e., attendance at meetings, time, etc.) will be covered by the participating JPI Oceans member countries. Upon request and subject to availability of funds, the participating countries may cover the costs of their national experts involved in the Knowledge Hub. Specific agreements on coverage of expert costs (e.g., hours, travel) will be handled on a national level, including incidental costs related to external meetings and events (e.g., registration fees to conferences, poster printing, etc.).

The coverage of costs of expert(s) that are specially invited, i.e., not nominated by a JPI Oceans member country, shall be agreed upon by the Steering Committee prior to the invitation of the expert(s).

In the pilot phase, participation will be limited to marinas willing and able to cover the costs of purchasing and installing standardised sensor packages, with each SOOP sensor costing circa €1,300 depending on production quantity. Marinas are expected to contribute an approximate total of €5,000 to cover all related expenses, including procurement, shipping, and installation of sensor packages; development and maintenance of supporting infrastructure, such as the data repository, dashboard, and EMODnet integration; communication, outreach, and training activities; as well as technical support for participating marinas. These costs will be borne directly by the marinas themselves or, where appropriate, in collaboration with national JPI Oceans Management Board members to ensure fairness at the national level. Early adopters will benefit from access to the wider network, increased visibility, and recognition as leaders in the “Marinas for Ocean Science” recognition programme.

While this pioneering group of marinas drives the start of the initiative, Task Group 1 will explore longer-term funding options for the development and maintenance of this Joint Action and will ensure that a clear process is established so that future marinas can join the initiative smoothly. Potential avenues include participation in Horizon Europe infrastructure calls, philanthropic support, industry sponsorships, partnerships with private sector companies, and platforms such as Ocean Matcher to assist marinas unable to finance sensors independently. Cost-efficiency mechanisms, such as equipment rental or leasing models in partnership with SOOP and other providers, will also be considered to reduce upfront expenses.

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