European Research
Infrastructure Consortium

9th EuroGOOS International Conference 2021

Marine Research Infrastructures Side Event
5th May 2021

"Cooperation Framework between Marine RIs"

Meeting Report

Contents

Executive Summary

The strengthening of links between the European Marine Research Infrastructures, as well as a common willingness to reinforce collaboration, resulted in an on-line event co-organized by Euro-Argo RISE partners and Euro-Argo Office during the 9th EuroGOOS International conference. The aim of the meeting was to bring together scientists and officers from the various marine Research Infrastructures and marine research communities across Europe to discuss future strategy under a co-designed collaborative plan within the landscape of the UN Decade of Ocean Science and the European Ocean Observing System.

The first half of the meeting consisted of eleven short presentations from each of the marine ERICs and research infrastructure communities providing an overview of the marine research infrastructure landscape to the wider EuroGOOS community and potential areas for future cooperation. The second half of the meeting was dedicated to three thematic discussions namely: implementation of the observing system, joint collaborative actions, and user engagement.

The main outcome was to agree and prioritise the list of suggested joint collaborative actions. The collaboration actions identified during the course of the meeting to be prioritised included:

- Development of a European OceanOPS system
- Development of integrated monitoring strategies
- Creation of joint education and training programmes
- Identification of common metrology standards and data inter-comparison procedures.
- Collaboration on technology development and sensor integration
- Publication of white paper on role and value of marine RIs
- Transnational / Trans-RI research projects
- Joint participation in funding proposals
- Identification of project deliverables for adoption across marine RIs
- Implementation of FAIR data principles
- Creation of common communications message(s).

1. Introduction

The forming of the European Research Infrastructure Consortiums (ERICs) has significantly increased the capability of a long-term planning and implementation of the monitoring component of the European Seas. Such benefits can be amplified by the combined activities, and joint efforts, of the different Marine Research Infrastructures (RIs). Joint collaborative activities between Marine RIs, especially in field monitoring under a synergistic monitoring strategy, is a key tool for the understanding of the oceanic system under a multi-disciplinary approach.

1.1. Context

The strengthening of links between the European Marine RIs are amongst the scope of the H2020 Euro-Argo RISE project. Following the last 5-years efforts of Euro-Argo ERIC, when several initiatives have been undertaken towards this scope, partners have formed a collaboration framework between existing and under-formation marine ERICs such as EMSO, LifeWatch, ICOS, Danubius, JERICO, EMBRC, EuroFleets, Jerico-RI, GROOM and SeaDataNet. This framework, as well as a general common willingness within the listed RIs to reinforce collaboration, enforced further discussion between these research consortiums and resulted to an open on-line event that was co-organized by Euro-Argo RISE partners and Euro-Argo Office during the 2021 EuroGOOS International conference.

1.2. Goals of the meeting

The aim of the meeting was to bring together scientists and officers from the various marine Research Infrastructures and marine research communities across Europe to discuss future strategy under a co-designed collaborative plan within the landscape of the UN Decade of Ocean Science and the European Ocean Observing System. The initiative was welcomed by several groups. The participation of a wide representation of infrastructures and communities at the meeting was designed to strengthen collaboration and set the ground for joint activities in the upcoming period. In line with the EOOS vision and the UN Decade of Ocean Science objectives, the meeting aimed to address and plan the next steps for the following topics:

- sharing of knowledge and expertise,
- strengthening cooperation on both field activities and new technologies,
- creating robust interactive data interfaces,
- promoting joint activities on marine research and services,
- raising public awareness on marine environmental issues.

1.3. Meeting organisation

For the organization of the event, Euro-Argo RISE T8.1 team contacted the EuroGOOS officers, the EuroGOOS 2021 conference hosts, and several key-people from Marine RIs communities. From the Euro-Argo office part, official invitations were sent to all the Marine RIs officers including the BEERI (Board of European Environment Research Infrastructures) and ENVRI representatives. In the beginning of 2021, a teleconference organized by Euro-Argo took place among Marine RI representatives in order to form the agenda of the event. It was decided to split the meeting in two hourly parts. The first part would be dedicated to short presentations from each RI focusing

on main scopes and collaboration aspects. The second part would be dedicated to 3 main thematic fields namely: a) Implementation of the observing system b) joint actions and RI's sustainability, and c) user engagement.

The event was published on the EuroGOOS conference web-page scheduled for the 5th May 2021, and it was entitled "Cooperation Framework Between Marine Research Infrastructures". From the Euro-Argo side, the event was promoted to scientists and research communities across Europe and received a wide acceptance since 226 people were registered. During the event less than half of this number actually attended however, such participation can still be considered very satisfactory and makes this event the first joint discussion of Marine RIs in front of a wide audience.

2. Meeting Presentations

The first half of the meeting was structured around short presentations from each of the marine ERICs and the aspiring research infrastructure communities to provide an overview of the marine research infrastructure landscape to the EuroGOOS community. This was the first meeting to have all eleven marine RIs together present to such a wide audience. The meeting was opened and introduced by Claire Gourcuff, Euro-Argo ERIC, and Dimitris Kassis chaired the first session

2.1. Opening

The first presentation of the meeting was by EuroGOOS Chairperson, George Petihakis, who set the scene for the meeting with the presentation "Marine RI landscape in Europe". A brief overview of the marine RI landscape was provided showing the complex picture within Europe. The challenge facing RIs is how to contribute to the bigger picture and the European Ocean Observing System in a positive way, solving the perceived problems of competition, fragmentation, complexity, overlaps, resourcing and capacity imbalance, without adding to the complexity of the landscape. The presentation closed with a summary of the sustainability challenges facing RIs and some future opportunities for alignment and collaboration.

2.2. GROOM-II

Laurent Mortier presented the H2020 GROOM-II (Gliders for Research, Ocean Observation & Management – Infrastructure and Innovation) project for the full design of an EU glider research infrastructure. GROOM RI supports the EuroGOOS Glider Task Team and will contribute as European partner to the global international OceanGliders programme. Cooperation, coordination and integration linkages with Euro-Argo, EMSO, EU Marine Robots, EuroFleets+ and EMSO were presented.

2.3. EuroFleets+

Niamh Flavin presented the H2020 EuroFleets+ project looking at the future design of a EuroFleets distributed RI providing access to research vessels, ROVs and AUVs. Many Member States are currently commissioning new vessels, with designs specifically for the deployment and recovery of ocean observation equipment. EuroFleets RI is being designed as a hub for oceanographic research providing centralised vessel and survey scheduling, floating universities, data provision, transnational and remote access and strong industry engagement, amongst other services.

2.4. EMSO ERIC

Laura Beranzoli presented EMSO ERIC, the distributed European Multidisciplinary Seafloor and water column Observatory ERIC consisting of fixed point, cabled and standalone, moorings and seafloor stations. EMSO currently collaborates with EuroFleets+, ENVRI FAIR, EuroGOOS and EOOS Operations Committee. Proposed areas to enhance cooperation included sharing sea operations schedules, training courses, data management and harmonization, technology development, intercomparison procedures, integrated monitoring strategies, and joint participation to projects.

2.5. DANUBIUS-RI

Adrian Stanica presented the ESFRI project DANUBIUS-RI which plans for full ERIC status in 2023. DANUBIUS is an international centre for advanced and integrated studies on river-sea systems bringing together marine, transitional and freshwater sciences across ten Member States. Ongoing cooperation with EMSO, LifeWatch, EMBRC, Euro-Argo, EPOS, ICOS, and many H2020 projects. Future collaboration opportunities include regional cooperation at supersites, including in the Black Sea.

2.6. Euro-Argo ERIC

Claire Gourcuff presented the Euro-Argo ERIC, the European contribution to the global Argo programme of 4,000 floats monitoring from the ocean surface to the abyss. Euro-Argo provides and supports 25% of the global Argo array. The vision for cooperation between marine RIs include sharing at-sea operational activities, integrating monitoring strategies, sensor technology development and testing, enhancing FAIR data sharing and data quality control/assessment, and common training courses.

2.7. JERICO-RI

Laurent Delauney presented JERICO-RI, the Joint European Research Infrastructure for Coastal Observatories, at the convergence between the land, open ocean, and atmosphere. JERICO-RI consists of ~500 platforms involving 19 Member States and 39 partners. JERICO addresses six topics in the Marine Strategy Framework Directive giving indication of collaboration opportunity with other marine RIs at regional and EU level, including integration of monitoring approaches, sharing technologies and best practices, joint workshops/training, transnational and remote access, and future joint project proposals

2.8. SeaDataNet

Dick Schaap presented SeaDataNet, a pan-European network of national oceanographic data centres consisting of 36 countries. SeaDatataNet is an AISBL since 2019. SeaDataNet is one of the major pillars supporting EMODnet and currently cooperating with many marine RIs in various EU projects in the areas of improving data FAIRness, data management and data sharing solutions, and EOSC related projects. Also cooperate on international and global scale as members of IOC-IODE, ICES, RDA and GEOCC.

2.9. LifeWatch ERIC

Christos Arvanitidis presented the distributed LifeWatch ERIC and e-infrastructure for biodiversity and ecosystems research. Special focus was given to the variety of activities involved in LifeWatch that include a strong component of field activities and monitoring. Under this aspect the importance for strong interaction and joint engagement monitoring strategies was highlighted along with the necessity for common strategy regarding education, training, and outreach activities.

2.10. ICOS ERIC

Richard Saunders presented ICOS ERIC for long-term, high precision traceable carbon observations in atmospheric, ocean and terrestrial domains. ICOS Ocean Thematic Centre (OTC) is the specialist marine centre to quantify the oceans' role in planetary carbon cycling providing services on labelling observations consistent with international best practice, sustaining data pathways between observations and policy makers, training, and technology development and verification. ICOS OTC propose collaborations in the area of data archiving, training, instrument evaluations, assistance with operations, and provision of calibration gases.

2.11. EMBRC ERIC

Nicolas Pade presented the EMBRC ERIC supporting marine biological research and innovation consisting of 9 Member States and 45 distributed sites. EMBRC provides access to ecosystems, collections of micro- and macro-organisms, experimental and analytical facilities, and development of advanced tools & techniques in omics research. Cooperation opportunities include potential super sites where multiple RIs interact; testing new equipment, integrating monitoring strategies (including biological observation), validation/test of new hypotheses, establishing sentinel sites for Europe. Also opportunity to collaborate on interoperability and joint access programmes.

2.12. EU MarineRobots

Joao Souza presented the H2020 EU Marine Robots project, to establish a world class marine robotics research infrastructure network in Europe. The project is focused on networking activities, joint research activities and trans-national access. Potential areas for cooperation include system design for connectivity and interoperability, standardization of data management, standard procedures for access to RIs, specialist training for multi-platform/multi-domain use, and networking for co-development of new science across multiple scales.

2.13. Summary

Although all the above marine RIs were constrained to short presentations due to the tight schedule of the meeting, they presented the most important aspects of each marine RI, highlighted their scope and objectives, and most importantly identified areas of potential of cooperation and joint activities.

3. Discussion Session

Claire Gourcuff introduced the afternoon's open session and the three topics of discussion, including the online Slido poll to capture the suggestions from the meeting attendees. Sylvie Pouliquen (Euro-Argo ERIC) distributed the link to her presentation on the large range of opportunities for marine RI cooperation as a basis for the discussions.

3.1. Implementation of the Observing System

Aodhan Fitzgerald (EuroFleets+ coordinator) moderated the session. The most frequent suggestions to facilitate the implementation of the ocean observing system was for coordination of operations at sea. EuroFleets+ are working towards a centralised system for sharing operations at sea, but other marine RIs need to share requirements for integrating operations across vessel schedules and vessel operators. Central planning is needed between all RIs to maximise opportunities at sea.

The suggested approach was to investigate developing a European OceanOps platform but the initiative cannot be undertaken by only one RI, it needs to be a cross-RI initiative. At present It is easier to plan activities in the global ocean through, for example, GOOS & OceanOps than plan and coordinate monitoring and operations in European waters on a formal, structured level. Currently, coordination relies on informal networks of contacts across RIs and research institutes.

A second suggestion was for identification or development of inter-comparable metrology standards given the large volume of observations undertaken, the data collected, and the calibration facilities involved for the different vessels, platforms, samples, etc. Once data has sufficient data quality and provenance then the user doesn't need to be concerned by what platform was used to collect the data. It is very important to have similar approaches to data collection and data formats. Such an initiative could be supported by a Coordinated Support Action (CSA) based on GOOS EOVs.

3.2. User Engagement

Christos Arvanitidis (LifeWatch CEO) moderated the session. There is a need to plan in advance the engagement of communities; many RIs' are working on co-design and co-creation with their communities. There is also a need to engage with the wider "community of practice"; those who are engaged in science. This is important to promote cross-domain research (eg. EOSC digital platform's science cluster projects) as these initiatives bring a lot of communities together. Currently engagement with users is done RI by RI but there are multi-RI users that need to be addressed at the multi-domain level. Multi-stakeholder engagement is a big challenge with multiple legislation and policies confounding the landscape. The concept of the "floating university" was mentioned as a good example of how to engage with users.

One suggestion was for all/most of the eleven marine RIs to work on some of the Grand Challenges and issue a visionary document of how the marine RIs plan to address them. It is important for the

sustainability of RIs to demonstrate what can be contributed towards the Grand Challenges and EU Missions and frame the visionary document towards those questions would be a very good start.

This could then be taken further by incorporating the suggestion of a Transnational / Trans-RI programme for a certain topic/period. The marine RIs would identify the "big question" and invite users/researchers to come and explore the services that the marine RIs have to offer. To advance this, the marine RIs could create and promote an online/animated map of what data is collected and where. This would simplify information on the marine RIs and make them more attractive and accessible for researchers to study particular topic/subject.

Suggestion to work within the global frameworks of EOVs, EBVs and making sure marine RI data is interoperable will allow greater opportunity to engage with policy makers and feed into policy decisions. The co-design and co-planning of the observing systems will be an important step in that process.

3.3. Joint RI activity and sustainability

Ulpa Leijala (ENVRI-FAIR WP3 co-lead) moderated the session on strategic aspects of marine RIs related to funding and sustainability under a cooperative framework. The joint participation in proposals, the planning of common projects and strategies, were amongst the discussed topics. While projects are good for collaboration the marine RIs need to work together sustainably in the long run. For example, using project funding to develop new processes/procedures/technologies that will then be adopted and implemented in the longer term through Member States funding for RI operations.

The pros and cons of a marine RI forum were discussed. The suggestion of a white paper / visionary document was mentioned again; detail the current contribution of marine RIs to the ocean observation landscape in Europe (the status quo) and then define what could be achieved with sustainable funding and the areas of interoperability increasing efficiencies in costs. Effort should be made to make this a very polished and professional document. This suggestion was repeated with contributions from a number of attendees who identified the need to sort and prioritise the proposed areas for collaboration, and source funding opportunities to support the implementation.

The RI's should target low-hanging, easily achievable, actions to ensure day-to-day cooperation in a practical fashion in the frame of current funded projects. If marine RI's cannot currently exchange data between themselves then that needs to be solved as it is one of the necessary steps for long term collaboration. Existing European structures such as EuroGOOS working groups, EOOS, etc, can be the primary avenue to advance many initiatives. The marine RIs do not have to build new structures.

It was acknowledged that the EC is unlikely to fund a sustainable ocean observing system, therefore the responsibility will be left to the Member States through funding of marine RIs. The proposed white paper is important to show to the Member States the value achieved by the RIs, as the national funders are one of the most important stakeholders. However it was also mentioned that for RIs with a global coverage, aiming as strengthening the Europe answer to global SDG a complementary funding of EC would be essential.

Finally, the event was summarised and the overall discussion was wrapped-up by Dimitris Kassis (Euro-Argo ERIC). Apart from the individually discussed items above, the importance of such collaboration initiatives was underlined and the necessity to continue and deepen collaboration between marine RIs was highlighted.

4. Main outcomes of the meeting

The main outcome from the meeting was to agree and prioritise the list of suggested collaboration actions. Each RI has a secretariat to support implementing the actions. This will show the marine RIs working together on a definite list of common priorities, whilst taking advantage of opportunities that are presented. A common communications message should be created for all users and stakeholders in member states to reinforce the value of marine RIs as the principal source of ocean observation data in Europe. Having the support of the European scientific community will be important in future engagements with the EC.

The collaboration actions identified during the course of the meeting to be prioritised included:

- Development of a European OceanOPS system
- Development of integrated monitoring strategies
- Creation of joint education and training programmes
- Identification of common metrology standards and data inter-comparison procedures.
- Collaboration on technology development and sensor integration
- Publication of white paper on role and value of marine RIs
- Transnational / Trans-RI research projects
- Joint participation in funding proposals
- Identification of project deliverables for adoption across marine RIs
- Implementation of FAIR data principles
- Creation of common communications message(s).

5. Appendices

5.1. Meeting Agenda

9th EuroGOOS Conference Side Event
5 May 2021 15:00 - 17:00 CEST
Cooperation framework between Marine RIs

- Final Agenda –

Welcome of participants - Claire Gourcuff - Euro-Argo (2 min)

Session 1 - **Marine Research Infrastructures landscape** (15:00 - 16:00 CEST)
Moderator: Dimitris Kassis - Euro-Argo

- The Marine RIs landscape in Europe - Georges Petihakis - EuroGOOS (10 min)

Marine RIs presentations (4 min per RI):

- GROOM – Laurent Mortier
- EUROFLEETS+ - Niamh Flavin
- EMSO – Laura Beranzoli
- Danubius - Adrian Stanica
- Euro-Argo – Claire Gourcuff
- JERICO-RI – Laurent Delauney
- SeaDataNet - Dick M.A. Schaap
- LifeWatch - Christos Arvanitidis
- ICOS – Richard Sanders
- EMBRC - Nicolas Pade
- EUMarineRobots - Joao Tasso

Session 2 - Marine RIs cooperation and joint activities (16:00 - 17:00 CEST)

- Marine RIs cooperation: a large range of opportunities - Sylvie Pouliquen (10 min)

Discussion on 3 topics (15 min each):

Topic 1: Observing system implementation (gaps/overlaps, coordination of operations at sea, sensors testing, etc.) Moderator: Aodhán Fitzgerald.

Topic 2: User engagement (joint engagement strategy, joint education & training, common services, communication, ocean literacy etc.) Moderator: Christos Arvanitidis.

Topic 3: Joint actions and RIs sustainability: contribution to UN Decade of Ocean Science, participation in common initiatives (projects, proposals, strategies), the ENVRI and BEERi cooperation forums. Moderator: Ulpu Leijala

Wrap-up & Closing - Dimitris Kassis (5 min)

5.2. Characterisation of meeting attendees from introductory Slido poll.

Professional Sector	Count
Research & academia	42
Governance (national delegate, policy maker)	4
Private sector & industry	2
Service providers	6
NGOs	2
Other	1

Your role	Count
Member of one or more Marine RIs?	37
User of one or more Marine RIs?	12
Future user of one or more Marine RIs?	5
Funder of one or more Marine RIs?	5
None of the above	6

How to you keep informed of RI news?	Count
Newsletters	27
Twitter	20
Websites	34
User meetings	27
None of the above	6

5.3. SLIDO responses to discussion topic 1

What would you suggest to facilitate observing system implementation (i.e. reduce gaps/overlaps, better coordinate operations at sea, facilitate sensors testing, etc.)?

- OceanOPS tool is there, but we could progress using the information inside the System to improve the coordination
- Ocean ops for Europe
- Better coordinate operations at sea
- What about cooperation with other Atlantic countries?
- We don't need another OceanOPS. We have one that is working, and are capable of providing Europe specific information already now - can be better with more resources.
- Better coordinate operations at sea
- Need an integrated and multi-platform design and integrate the different regional observing systems with platform-oriented RIs.
- Sharing of information and coordination at basin scale
- Observing system assessment to reduce gaps/overlaps and draw recommendations
- An organization like EOOS can, and should, play a role in coordinate observing efforts. The EOV framework is useful in this regard.
- For me one key place to talk is the JPI. That is the place where European funding agencies come together to discuss shared priorities
- Interoperability
- We are happy to support pCO2 observing on any research vessel from a ICOS member country and are interested in supporting research grant applications in this space, either to your domestic funding agencies to EU programmes
- Well documented (FAIR) datasets
- Long term support from EU + National/Regional contribution
- align with the GOOS
- dissociate support activities and science
- How to develop Integrated monitoring strategies for filling knowledge gaps, network gaps, reduce overlaps
- Secure the funding
- Better Coordination in Advance
- Coordination
- Maximise resources
- Sustainable financial support
- Try to plan operations jointly
- More interaction is needed between RIs beforehand when the field activities are planned.
- Use common best practices and coordinate these
- Central hub for integration and collaboration/cooperation
- "Need to develop a Ocean Observing monitoring System for Europe like the one set up by OceanOPS for GOOS
- Integration between ocean observing networks to reach agreed on targets based on essential ocean variables.
- 1. Integration of Data (FAIR), Reproducible Analytics (technical integration layers) and Mobilized Communities (cross-domain research);
  2. Identification of our common fields of investment (our trading zones);
  3. Common vision and implementation plans"
- Sharing procedures and coordinate operations at sea
- Coordinate operations at sea
- Central planning/scheduling system (moorings/gliders/vessels, etc.)

- Need for a European "OceanOPS equivalent"
- Set up a good coordination system
- Coordinate operations at sea
- Facilitate sensor calibration in connection with the EMN for Climate and Ocean Observation
- Organising a global mapping... OceanOPS could help
- An integrated data management strategy including striving for interoperable and well documented (FAIR) datasets
- Better coordinate and integrate operations at sea
- The easiest is to better coordinate operations at sea
- Sharing sea operation procedures and schedules

5.4. SLIDO responses to discussion topic 2

What would you suggest to enhance user engagement (joint engagement strategy, joint education & training, common services, communication, ocean literacy etc.)?

- Working out how to engage industry into the system is crucial. A large fraction of in water observing is done by industry at great expense. Incentivising them to share these data is tough for a lot of reasons but if we could get it right routinely it would be a really big step forward
- Develop common joint paper from multi-RI answer to some grand challenges presently raised by society
- Is there a place on the web where every RIs are presented with a possibility to display "live information"? (remind me something that sounds like ENVRI+)
- Common challenges that all RIs can work together can be possibly identified and chosen from the Green Deal
- communication
- Joint white paper/strategy on Climate
- Focus on getting RI data to EOVs and EOBs
- Facilitate multiple ""Floating universities"" and other initiatives in EF+ very easy to incorporate cross RI training activities in co-operation with other RI's
- Improve the accessibility to Data (FAIR) and tools for surfing over them thanks to simple and basic virtual training services. This will improve the user engagement.
- RV's can be great tools for outreach and can be used for other RI's outreach also
- A coherent and continuous plan for engage users looking to the needs and the offers of each category of them (e.g., industry, governmental agencies)
- Likely to happen in Ocean Decade? but a central Ocean News Agency
- Increase PR activities
- Citizen science
- Important to identify power and/or interest of the different users in order to properly engage them
- Any chance to include citizen scientists
- Days of “open doors" to present the capabilities to potential users
- Online stakeholder forum
- Common services, products and tools
- +1 for cross trainings activities!
- Very good promotion campaigns so that users become more aware where data are originating and hand-in-hand with improved discovery and access to all these data in a FAIR way
- Organizing training across the marine domain
- Survey of user needs - provide the services they require, co-creation of services
- Joint education & training, integrated services

- Joint education and training
- Provide joint education and training programs for scientists
- Cross RI training activities ...
- Maybe set up specific days within a year for joint activities on outreach and public awareness across countries.
- Need to develop common strategies, positions, policies, communication and participations so that together We have a stronger voice, more opportunities, and larger visibility
- Develop joint stakeholder engagement strategies and identify their information needs in order to provide fit-for-purpose observation systems and tailor-made information
- Tailored engagement strategy for each stakeholder category
- Develop interoperable methods that deliver comparable data
- common answer on big challenges
- Joint education & training
- Facilitate the access!
- Joint engagement strategy and communication services
- 1. Co-design, co-creation;
  2. Community of practice (CoP);
  3. Cross-domain research (e.g. EOSC Future platform)

5.5. SLIDO responses to discussion topic 3

What would you suggest to develop joint actions & foster RIs sustainability (e.g. contribution to UN Decade, participation in projects, etc.)?

- Concrete action towards defragmentation: Joint task force on partnership with industry (for the RIs targeting industry as an important user/stakeholder), gathering "business developers" from relevant RIs.
- What about learning from the meteorologists! They have history on networking and joint actions by developing and improving their data and information exchange through their institutions and agencies. Seems that they have efficient protocols and procedures backed up by the decision makers
- We have a newsletter which you are all welcome to have access to - we try to tweet it out @OTCCO2
- A compilation of Examples of benefits to end users that can be communicated to funders
- Joint Actions
- Focus more on capacity maintenance next to the efforts on building capacity. Rate of recruitment to ocean science disciplines remarkably decreasing since there very limited employment contingents available, in general! In addition, intermittent funding opportunities, mainly like projects, makes impossibly difficult to design and run a long term joint actions'
- Regular newsletter to share the topics done by every RI
- Sometimes I think that the 'observing system' consists of multiple players; funders, RIs, deliverers (who often blend funding streams to deliver observations) and coordinators. I'm struggling to think of a forum where they all come together to agree a plan and creating that dialogue would be very useful
- Establish regular workshops / meetings between RI CEOs
- Pooling of resources that can be shared within Marine RIs (at least at national level)
- Joint projects, joint TAs, Joints scientific use cases...
- Produce RI reports every 2-3 years and show some common achievements
- Participation in common projects
- Identify areas of overlap and reduce duplication
- Training for common RI requirements

- To merge different funding sources (EU grants, national, regional, private) to secure long term sustainability
- Common joint action to answer clearly defined question in line with RI objective and societal needs
- CSA?
- Participation in projects
- User benefit cases examples
- The long-term sustainability is a big issues and cannot be based on projects but is a long term planning for funding the RIs presenting themselves an integrated manner
- Common workshops
- A common open forum where the marine RIs communities could plan joint actions
- Facilitated overview of what observation is being made, what parameters, etc.
- Joint HEU project proposals
- The theoretical basis of the RIs collaboration: "consilience and synthetic knowledge" (a kick will be provided in my short talk);
- Our "trading zones", the places where the RIs invest in common;
- "Cross-domain research avenues", examples from EOSC platform;
- Focus on the "RIs primary mandate": we offer infrastructure to facilitate research for:
    - Societal challenges
    - Stakeholder engagement
    - Promotion of HEurope concepts, such as European Green Deal and Missions.