



JERICO-S3 DELIVERABLE

Joint European Research Infrastructure for Coastal Observatories Science, Services, Sustainability

DELIVERABLE #, WP# and full title	JERICO-S3 D.2.1 – WP 2 - “Collaboration and interoperability with other RIs”
5 Key words	Research Infrastructures, ESFRI, collaborations, MoC, interoperability, sustainability
Lead beneficiary	CNR
Lead Authors	Carolina Cantoni, George Petihakis
Co-authors	Jukka Seppala (SYKE), Holger Brix (HEREON), Laurent Delauney (IFREMER), Dominique Durand (COVARTEC)
Contributors	
Final version date/ Submission date	29.07.2024

Nature: R

(R = Report, P = Prototype, D = Demonstrator, O = Other)

Dissemination level: PU

PU = Public, PP = Restricted to other programme participants (including the Commission Services), RE = Restricted to a group specified by the consortium (including the Commission Services), CO = Confidential, only for members of the consortium (including the Commission Services)

GRANT N°: 871153

PROJECT ACRONYME : JERICO-S3

PROJECT NAME : Joint European Research Infrastructure for Coastal Observatories - Science, services, sustainability

COORDINATOR : Laurent DELAUNEY - Ifremer, France - jerico@ifremer.fr

According to the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) and the 78-17 modified law of 6 January 1978, you have a right of access, rectification, erasure of your personal data and a right of restriction to the data processing. You can exercise your rights before the Ifremer data protection officer by mail at the following address: IFREMER – Délégué à la protection des données- Centre Bretagne – ZI de la Pointe du Diable – CS 10070 – 29280 Plouzané - FRANCE or by email: dpo@ifremer.fr + jerico-s3@ifremer.fr Ifremer shall not hold your personal data for longer than necessary with regard to the purpose of the data processing and shall destroy it thereafter.

DOCUMENT TECHNICAL DESCRIPTION

Document ID	JERICO-S3-WP2-D2.1-290724-V1
--------------------	------------------------------

REVISION HISTORY			
Revision	Date	Modification	Author
V0.1	01/03/2024	Table of contents and first draft	Carolina Cantoni, George Petihakis
V0.2	05/06/2024	Template provided and request of contribution	Carolina Cantoni, George Petihakis
V1.0	29/07/2024	Full and complete draft	Carolina Cantoni, George Petihakis, Jukka Seppala, Holger Brix

APPROVALS				
	Name	Organisation	Date	Visa
Coordinator	Delauney Laurent	Ifremer	29/07/2024	X
WP Leaders	Holger Brix	HEREON	29/07/2024	X

Diffusion list			
Consortium beneficiaries	Third parties	Associated Partners	other
X	X		

PROPRIETARY RIGHTS STATEMENT
THIS DOCUMENT CONTAINS INFORMATION, WHICH IS PROPRIETARY TO THE JERICO-S3 CONSORTIUM. NEITHER THIS DOCUMENT NOR THE INFORMATION CONTAINED HEREIN SHALL BE USED, DUPLICATED OR COMMUNICATED EXCEPT WITH THE PRIOR WRITTEN CONSENT OF THE JERICO-S3 COORDINATOR.

TABLE OF CONTENT

1. EXECUTIVE SUMMARY	5
2. INTRODUCTION	5
2.1. The European Environmental RI landscape	5
3. Joint endeavors and plan for strategy alignment	7
3.1. Prioritizing the actions	7
3.2. DANUBIUS - ESFRI	8
3.3. EMSO- ERIC	10
3.4. ICOS - ERIC	13
3.5. EMBRC - ERIC	15
3.6. AQUACOSM-plus	16
3.7. GROOM II	17
4. CONCLUSIONS	20
5. ANNEXES AND REFERENCES	21
Annex 1: Memorandum of Collaboration between DANUBIUS and JERICO-S3	21
Annex 2: Memorandum of Collaboration between EMSO-ERIC and JERICO-S3	26
Annex 3: Memorandum of Collaboration between ICOS-ERIC and JERICO-S3	32
Annex 4: Memorandum of Collaboration between GROOM II and JERICO-S3	38

1. EXECUTIVE SUMMARY

Throughout the JERICO-S3 project, numerous efforts have been undertaken regarding both local collaborations as well as efforts on a project/infrastructure management level between JERICO-S3 and several marine projects and Research Infrastructures (RIs) to establish strategic as well as working relationships, aiming ultimately to formalize these partnerships through the signing of "Memorandums of Collaboration" (MoC). This deliverable presents an overview of the landscape of marine environmental research infrastructures, underscoring the significance of these collaborations for JERICO-S3 and the research community as a whole. We outline the approach adopted to foster these collaborations, provide a summary of the partnerships developed, and detail the main points of the formal collaboration documents (MoCs) that have been signed or are in the process of being signed with various RIs and projects.

2. INTRODUCTION

2.1. The European Environmental RI landscape

Today in Europe there are two main categories related to Research Infrastructures; the Infrastructure projects and the European Research Infrastructure Consortia (ERICs). The first steps towards a European Research Infrastructure are supported by related Infrastructure projects that enable RIs to come together and work towards building integrated multi-platform observing systems, reduce overlaps, fill gaps, increase efficiency, enable interoperability, agree on data and metadata standards, and adopt new available technologies.

RIs work together and develop common solutions at all stages of their planning, design and operation, guaranteeing their complementarity and interoperability, increasing efficiency and avoiding duplication of effort. JERICO has benefited from three consecutive infrastructure projects (JERICO, JERICO-NEXT and JERICO S3) and a design study (JERICO DS).

On the other hand, the European Research Infrastructure Consortia (ERICs) are a specific legal form that facilitates the establishment and operation of Research Infrastructures with European interest. The ERICs allow the establishment and operation of new or existing Research Infrastructures on a non-economic basis. The advantages of ERICs is that they are a legal capacity recognised in all EU countries, with the flexibility to adapt to specific requirements of each infrastructure. Creating an ERIC is a faster process than creating an international organisation while exemptions from VAT and excise duty are also foreseen. An ERIC may adopt its own procurement procedures which have to respect the principles of transparency, non-discrimination and competition.

An organisational structure within the European landscape is the ENVRI, a community of Environmental Research Infrastructures, projects, networks and other stakeholders interested in environmental Research Infrastructures (<https://envri.eu/>). It is a common forum for the environmental research infrastructures to work together, share knowledge and develop joint solutions within four domains: ocean, atmosphere, solid earth and ecosystem/biodiversity. It has developed and expanded within several EU funded projects. This community was established in the ENVRI project that focused on common operations



of environmental Research Infrastructures. The follow-up project ENVRIplus was dedicated to finding common solutions to shared information technology and data related challenges by utilising multi-disciplinary expertise. The latest project supporting the cluster activity was the ENVRI-FAIR project that focused on ensuring provision of environmental data, tools and other services that are open and following FAIR principles. In these ENVRI cooperation initiatives, the overarching goal has been to move from separated domains towards an integrated conduct that allows for a system science approach with multidisciplinary services to tackle environmental challenges and establish products for various societal needs.

In the marine domain (Fig. 1), the existing RIs are either technology/platform driven (e.g., EuroArgo and EMSO) or focus on a particular set of observations (e.g., ICOS). Therefore, these RIs often concentrate on particular ocean regions that have clearly specified limits.. In that context, JERICO-RI targets observations of the coastal ocean, providing multidisciplinary data for coastal science and societal applications. Being part of ENVRI Community helps the involved Research infrastructures with their specific implementation needs (through learning from other RIs and sharing knowledge on lessons learned), supports stakeholder engagement and gives wider visibility and stronger voice to the RIs in the environmental field. Although ENVRI provides a platform for communication and cooperation, considering the common challenges between different RIs, the possible issues of overlapping, the land-ocean continuum and the need for working together towards co-design, minimisation of costs and maximization of benefits etc. bilateral cooperation among neighboring RIs is a necessity. In this context JERICO seeks bilateral cooperation with existing infrastructure projects and ERICs.

A number of MoUs (Memorandum of Understandings) and MoCs (Memorandum of Collaboration) were prepared and are in the process of being signed with related marine environmental research infrastructures and ERICs. An MoU is a document signed by representing entities that describes the general principles of an agreement between parties but does not amount to a substantive contract. A MoC is similar to a MoU but signed by scientific coordinators of the projects and RIs as representing the community. Existing MoU's between ERICs and various research performing organisations were reviewed. It was decided by the JERICO-S3 consortium that MoCs are the appropriate form to establish relationships between the JERICO and other RI communities at this point in time.

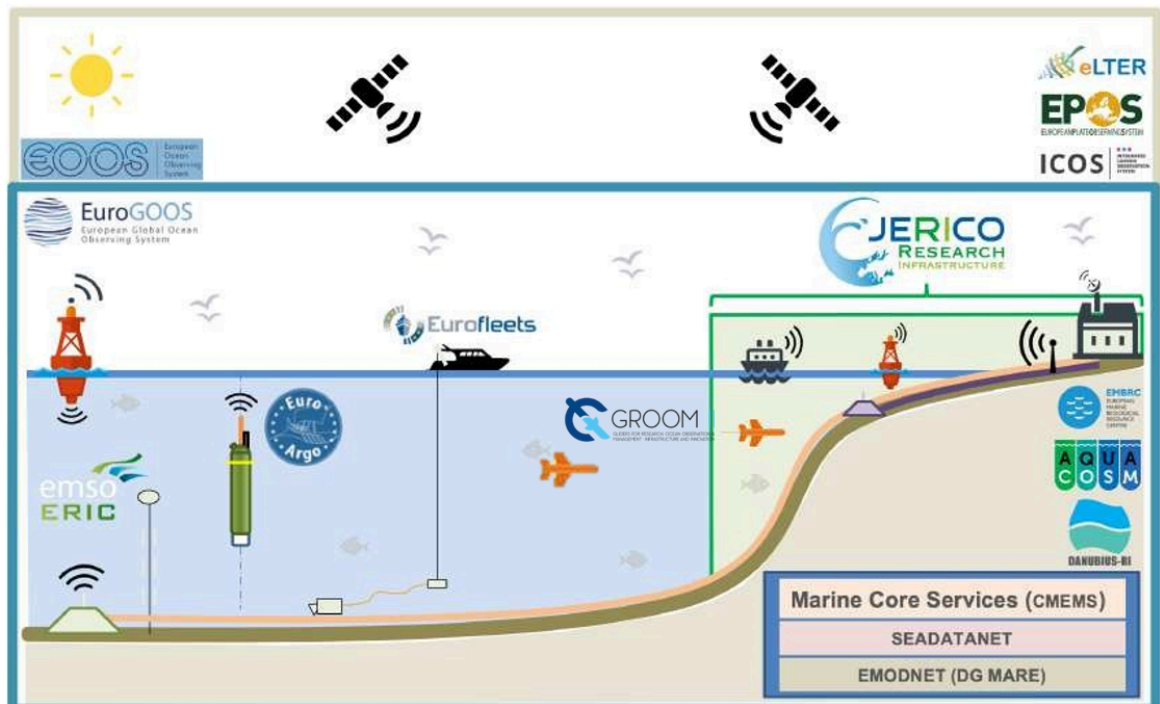


Figure 1 The EU marine landscape around JERICO-RI

3. Joint endeavors and plan for strategy alignment

3.1. Prioritizing the actions

As mentioned above, in the absence of guidelines and priorities from the European Commission at the early times of the process of RI setting, today there are multiple “drivers” behind the establishment of the existing RIs. Some are focusing on a particular technology, others on a specific process while there are also examples targeting an ecosystem type or a geographic region. In this complex landscape in order to analyze the commonalities between existing RIs and JERICO and to help prioritizing the actions, a field matrix was constructed to highlight the most important collaborations that had the highest priority to pursue.

The RIs with most common objectives with JERICO were rated with the highest priority for the need of a formal agreement. Out of the ten RIs, Danubius was identified as the highest priority, followed by EMBRC, EMSO and ICOS. GROOM was also considered as a priority given that gliders are also a key component of JERICO and thus possible overlaps and conflicts should be avoided. Finally, MINKE, the metrology infrastructure, although of high relevance to JERICO community was not considered for a formal collaboration agreement and this deliverable, since most of JERICO partners running metrology services are members of MINKE and thus there is already a strong connection.

Collaboration field	EMBRC	EMSO	EuroARGO	ICOS	Danubius	eLTER	LifeWatch	AQUACOSM	JERICO	GROOM	MINKE
Marine Biology	X	X			(X)	X	X	X	X		
Ecology Research	X				X	X	X	X	X	X	
DeepSea Platforms		X								X	X*
Subsurface Ocean Properties			X	Not yet					X	X	X*
Marine Carbon Cycle			X	X				(X) ecological aspects	X		X*
River-sea Continuum					X				X		
Ecosystem structure and functions						X	X	X	X	X	
Near shore sites	X	X		X	X	X			X		
Biodiversity	X	X				X	X		X		
Mesocosms								X			
Biogeochemistry		X	X	X	X	X			X		
Data	X	X	X	X	X	X	X	X	X	X	X*
Services	X, access	X	X (data provision)	X	X	?	X (IT services)	X (access)	X	X	X*
Comments	Services different from Jerico.					mainly land based obs, few marine components	IT-Services				X* metrology, calibration data quality
Priority for MoC	2	2	3	2	1	4	4	4	0	2	2

Tab 1. The “field matrix” constructed to prioritize actions

3.2. DANUBIUS - ESFRI

DANUBIUS-RI's is a European Research Infrastructure that aims to facilitate and contribute excellent science on the continuum from river source to sea; to offer state-of-the art research infrastructure; and to provide the integrated knowledge required to sustainably manage and protect River-Sea Systems. DANUBIUS-RI's Vision is to achieve healthy River-Sea Systems and to advance their sustainable use, in order to live within the planet's ecological limits by 2050 (<https://danubius-ri.eu/>). Recognizing the importance of these systems for the environment, economy, and human health, the European Strategy Forum on Research Infrastructures (ESFRI) included DANUBIUS in its roadmap in 2016.

JERICO-S3 promoted several meetings with DANUBIUS which laid the groundwork for the two communities to work together in the sites participating in both projects.

One opportunity used to stimulate collaborations was the Transnational Access offered by JERICO-S3. A project to access the S1-GB station in the Northern Adriatic (JIVE: JERICO-DANUBIUS-RI Observation Initiative) was presented by the University of Stirling, coordinator of the DANUBIUS observation node, to test different instrumentation packages with the aim of establishing functional relationships between optical properties, sediment characteristics and river outflow.

Unfortunately, due to a series of technical problems, it was not possible to implement the TNA proposal, but its drafting catalyzed the dialogue and discussion between the two communities.

Existing relationships between JERICO-S3 and DANUBIUS partners were used to explore areas of possible collaboration such as sharing technology and infrastructure and compare / align standards in the Elbe River area. Combined funding from national projects and ERDF (European Regional Development Fund) led to the joint establishment of a floating research platform in Tesperhude in the freshwater part of the Elbe River as well as the joint use of the existing JERICO installation in Cuxhaven at the Elbe mouth. Data from these measurements are made available through the Helmholtz-Zentrum Hereon. Unfortunately, the German participation in DANUBIUS was canceled in 2022.



Figure 2: Map of the tidal portion of the Elbe River. 1/3: JERICO-DANUBIUS stations Tesperhude and Cuxhaven, respectively; 2/4: autonomous measurement stations operated by state authorities.

In 2023 JERICO, DANUBIUS and ICOS participated together in the drafting of the “LandSeaLot” (Land-Sea interface: let’s observe together!) EU project (HORIZON-CL6-2023-GOVERNANCE-01) that was funded with the GA No 101134575 (<https://landsealot.eu/>). The main focus of the project is to seek better integration and collaboration between communities working in the land-sea interface, including the JERICO and DANUBIUS communities.

Three sites of integration activities in JERICO-S3, i.e., the North Sea PSS, the North Adriatic-IRS, and the NW-Med are part of the project as "Integration Labs", true drivers of integration and collaboration between the two RIs in this new phase.

The collaboration between JERICO and DANUBIUS is being formalized with the signing of a "Memorandum of Collaboration" (MoC), on the terms of which a common agreement has been reached.

The complete text, signed by both partners, is part of this report (Annex 1); the main points of collaboration are:

1. Collaborate to develop best practices at the global level in the field of the land-sea continuum.
2. Sharing experiences and best practices on data interoperability and metadata

standardization;

3. Developing integrated (common and complementary) services.
4. Organizing joint training activities based on the common requirements of the members and users of both Parties.
5. Define the role of each partner to strengthen the observing capabilities in coastal and shelf zones.

It is therefore the purpose of the subscribed MoC to create a collaborative framework for ensuring a sustained cooperation between JERICO S3 and DANUBIUS regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration.

In order to fully achieve the purpose of this Agreement, the two communities will take the following actions:

- Establish fora for cooperation at strategic as well as technical levels;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity and best practices;
- Investigate opportunities for concrete collaboration on the development of standards to increase the interoperability of data and information provided by the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavors basis);
- Raise awareness of the complementarity of the two initiatives in each of their two communities;
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape;
- Influence the European and national science agendas and future joint funding initiatives;
- Establish a working group to interact with industry in a collaborative way as one voice.
- Building on the LandSeaLot project, establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;

3.3. EMSO- ERIC

The European Multidisciplinary Seafloor and Water Column Observatory (EMSO) was created in 2006 and was included by the European Strategy Forum on Research Infrastructures (ESFRI) (ESFRI, 2018) in its roadmap among the essential European large-scale research infrastructures. In 2016, EMSO (<https://emso.eu/>) obtained the status of ERIC and published its Statutes in the EU Official Journal. EMSO is a distributed research infrastructure with eight European countries participating. It is strategically distributed at key locations around Europe, from the Nordic Seas to North East Atlantic through the Mediterranean to the Black Sea. Although EMSO started as offshore deep water cable observatories, in the last few years it has expanded, including also water column fixed point platforms equipped with multiple sensors. EMSO ERIC aims at promoting excellent science through the coordination of fourteen regional facilities, serving marine science researchers and technology engineers, policymakers, industry and the

general public. EMSO ERIC supports multidisciplinary research (marine ecosystems, climate change and geo-hazards) in order to achieve sustainable management and protection of marine resources and to understand the complex interactions among the geosphere, biosphere, hydrosphere and atmosphere. Today, EMSO offers data and services to a large and diverse group of users, from scientists and industries to institutions and policy makers. A prominent characteristic is the provision of financially supported physical access to users outside the community. Thus, with the support of EMSO (financial and technical) users can have access to unique infrastructures, promoting novel and frontier research.

Despite that EMSO is focusing on off shore waters and JERICO on the coastal area, currently collaboration among the various platforms is mainly taking place at two JERICO PSS in the framework of an integrated approach (off shore to coastal continuum). PSSs in JERICO are used to demonstrate how transnationally and trans-institutionally integrated multidisciplinary and multiplatform observations add value to our ability to answer the multiple key scientific and social challenges the coastal ocean is facing (D4.1 JERICO-S3 Pilot Supersite Monitoring Strategies). In particular in the NorthWestern Mediterranean and the Cretan Sea, EMSO and JERICO observing platforms operate in collaboration, fulfilling most of the PSS key characteristics described in the corresponding deliverable D4.1:

- High spatial density of multiple observing platforms offering the required spatiotemporal resolution to study phenomena at nested spatio-temporal scales up to mesoscale;
- Multi-interface coverage (land-sea, air-sea, offshore-coastal, pelagic-seafloor) via well established links to other RIs and addressing, in collaboration with other RIs, themes (commonly defined by the RI) at global and regional levels as well as to specific local requirements;
- Multivariable and adequate spatiotemporal coverage (i.e., required resolution) of essential ocean variables (EOV). Multivariable coverage of essential biodiversity variables (EBVs);
- Centralised coordination of observations;
- Part of an established (or under a roadmap) National RI

In this context the platforms within the two PSSs:

- Have well-established research themes based upon local, national, regional and global requirements driven by science and society
- Share, synoptic, interoperable, and openly available biological, biogeochemical, and physical data,
- Deliver operational data to International (EU) portals,
- Share platforms, equipment, knowledge, products, tools and services,

- There is a common design and implementation of missions with other Supersites and other JERICO observation systems and sites,
- They have fully documented harmonized procedures and best practices,
- There are well established links to users, especially in science, society, industry and policy,
- Provide jointly products and services to multiple users such as CMEMS, regional authorities, remote sensing and operational modeling communities etc.

Despite the many points of common interest, the formalization of a collaboration between the two infrastructures was slowed down by the technical time required for the appointment of the new general director of EMSO, Dr. Ingrid Puillat, which did not take place until May 2024.

Dr. Puillat, former scientific coordinator of the JERICO and JERICO-NEXT projects, was a guest at the general assembly of the JERICO-S3 project in June 2024. This was followed by some meetings between the two coordinators and some JERICO-S3 partners and EMSO during which the draft MoC (Annex 2) was finalized. It is currently being reviewed by the EMSO community for formal approval and is expected to be signed within a few months.

The complete text is part of this report (Annex 2) and the main points of the MoC are reported here:

The purpose of this MoC is to create a collaborative framework for ensuring a sustained co-operation between the Parties regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration. EMSO ERIC and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Track recording of the collaboration framework, under the initiative of JERICO-S3, with European marine research Infrastructures.
2. Identifying scientific and societal challenges that would benefit from being tackled jointly by the two RIs (such as climate change, land-coast-offshore continuum, Greening of RI activities, process-driven observations, etc.).
3. Harmonising and aligning our effort related to operation and further development (innovation) of fixed platforms.
4. Defining services to be jointly developed by the parties.
5. Jointly developing an ad-hoc solution for ensuring operation and access to the European fleet of Autonomous Vehicles, from offshore to coastal regions (or reversely), and propose subsequent services and a model for operating them.

In order to achieve the purpose of this MoC, the Parties define the scope as follows:

- Establish fora for strategic cooperation and alignment;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity and best practices;
- Establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;

- Investigate opportunities for concrete collaboration on the development of standards to increase the interoperability of data and information provided by the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavours basis);
- Investigate opportunities for the development of common technology and services components of use in relation to both Parties;
- Raise awareness of the complementarity of the two initiatives in each of their two communities;
- Communicate to the common stakeholders the benefits of the collaboration and the value of marine observing in general;
- Joint interaction with key stakeholders, such as industry, Copernicus, EuroGOOS, on topics of common interests.

To work toward these goals, the parties envision to (list not restrictive):

- Develop a joint strategy for observing the common domain between the shelf seas and the deep ocean, the slope;
- Jointly develop observing technology of common interest to address common scientific and technological challenges, as for building upon the experience of the EGIM (cEGIM), extending to generic technology such as IoT and AI for smart and augmented observatories, including genomics;
- Jointly address best practices to address common scientific and technological challenges systems such as:
 - Fixed platform technology, cables and associated sensors;
 - Jointly address management of data (especially biogeochemical parameters), which are poorly or not at all managed by current Marine data repositories, and progress on best practices on data interoperability and metadata standardization;
- Create added-value from sites and observatories contributing to both EMSO and JERICO science strategies;
- Joint management (or at least coordinated approach) of key stakeholders that both RIs have in common, such as CMEMS/EDITO, EuroGOOS, EMODnet, Blue cloud, industry (both technology developers and users of the ocean space);
- Organise joint training activities based on the common requirements of the members and users of both Parties;
- Co-design products and services, as appropriate;
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape.

3.4. ICOS - ERIC

The Integrated Carbon Observation System (ICOS) is a European research infrastructure designed to provide high-quality, standardized data on greenhouse gas concentrations and fluxes. In 2006, ICOS was included in the roadmap of the European Strategy Forum on Research Infrastructures (ESFRI), recognizing it as a critical infrastructure for Europe's environmental and climate research efforts. In 2015, ICOS achieved the status of a

European Research Infrastructure Consortium (ERIC), formalizing its role in the European research landscape and enhancing its ability to operate across multiple countries. The ICOS ERIC (<https://www.icos-cp.eu/>) facilitates standardized data collection and sharing from more than 170 measurement stations across 16 European countries. These stations monitor greenhouse gas concentrations in the atmosphere and carbon fluxes between the atmosphere, land surface, and oceans.

ICOS's mission is to produce high-precision, long-term observations and facilitate research to better understand the carbon cycle and provide essential information on greenhouse gases. Moreover, ICOS promotes technological developments related to greenhouse gas monitoring by linking research, education, and innovation. The data and insights generated by ICOS support policymakers and stakeholders in making informed decisions to combat climate change and its impacts.

ICOS marine stations play a crucial role in monitoring greenhouse gases within the marine environment. These stations are strategically located in the Atlantic Ocean, as well as the Nordic, Baltic, and Mediterranean Seas. The Ocean Thematic Centre (OTC) coordinates the network of ocean stations providing support and training to help them acquire the highest quality data for studying carbon fluxes and their drivers, ensuring that data collection is both accurate and consistent.

Currently, some stations in the coastal areas are equipped with instruments providing different sets of data to both the research infrastructures: sea surface pCO₂ for ICOS and other sets of parameters, also along the full water column, for JERICO-S3.

This dual functionality highlights the complementarity of the parameters observed and the benefit of the shared use of buoys, platforms, and ships of opportunity. Consequently, a draft Memorandum of Collaboration (MoC) has been initiated (Annex 3).

The following points of collaborations have been discussed and agreed upon by the JERICO-S3 partners working on carbonate chemistry and coastal pCO₂ measurements:

ICOS-ERIC and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Sharing experiences and best practices on data interoperability and metadata standardization;
2. Sharing experiences and best practices on FerryBox and fixed platform technology and associated sensors.
3. Organising joint training activities based on the common requirements of the members and users of both Parties.
4. Co-designing of operations and coastal observing systems benefitting from the already existing facilities
5. Co-organizing of intercalibration exercises on variables of common interest through, for example, participation of the JERICO-RI community in pCO₂ oceanic sensors inter-calibration organized by ICOS-RI
6. Co-planning of measurement activity to benefit from cross validation of data and densification of measurements and parameters.

7. Expanding the network reach of each RI by offering their respective facilities/platforms for the installation of sensors related to the research questions and/or other requirements of the respective RI.

Unfortunately, there has not yet been an opportunity to discuss the document with OTC Director Richard Sanders or ICOS Director General Werner Kutsch, however the work done provides an excellent foundation for continuing the dialogue with ICOS and reaching a formal collaboration agreement soon. Talks are foreseen during the ICOS Science Conference in September 2024, where ICOS and JERICO members chair sessions together.

3.5. EMBRC - ERIC

The European Marine Biological Resource Centre (EMBRC) was established in 2013 to advance fundamental and applied marine biology and ecology research – while promoting the sustainable blue economy, in 2018 it received the legal status of ERIC. EMBRC enables access to services, facilities, and technology platforms in more than seventy marine stations in nine European countries in support of robust, cost-effective and efficient marine research. At its core, EMBRC is a distributed research infrastructure, uniting a network of marine stations, laboratories, and research facilities across various European countries.

This extensive collaboration allows for unparalleled access to diverse marine environments and ecosystems, from coastal habitats to the deep sea, enabling scientists to conduct high-impact research that addresses pressing environmental and societal challenges. EMBRC's infrastructure supports a wide array of research activities, including biodiversity and conservation studies, marine biotechnology, and the impacts of climate change on marine life. It provides essential resources such as state-of-the-art laboratories, advanced scientific equipment, and access to a vast collection of marine organisms. Moreover, EMBRC facilitates the sharing of data and knowledge through its integrated data management systems and collaborative platforms, promoting open science and interdisciplinary research.

The organisation of the observation space in the coastal region is of particular relevance to JERICO-S3. Although the coastal zone is arguably the best studied marine environment, there is still a significant lack of biological observation data. Whereas EMBRC is developing a strategy for fixed point 'omics based observation around its long term study sites, JERICO-RI, with a network of stationary observations, gliders, and autonomous vehicles, has the potential to add significantly to biodiversity observation by filling in the gaps along Europe's coastline. In order to ensure complementarity between fixed point observatories and temporary observation points, JERICO-S3 and EMBRC aim to explore complementary methodologies and metadata standards to ensure comparability of data between their sites. Deployment of similar sampling technologies will also be explored and calibration exercises carried out on a regular basis between the observatories. The coordination of observation efforts will also contribute to the creation of sites where multiple RI activities take place in the same area, creating a high resolution site covering many parameters and substantially increasing the contextual data available for each type of observation.

An active dialogue is ongoing with the aim of establishing a concrete and science-challenge driven memorandum of Collaboration between JERICO-S3 and EMBRC. The following targets have been identified:

- **Jointly address environmental challenges** related to living-organisms such as HAB, invasive species, and pathogens. It is recognised that identifying, qualifying, understanding variability and dynamics, and informing stakeholders can best be tackled by joining efforts between the two RIs. While EMBRC provides the biological characterisation of threats (biodiversity, taxonomy), JERICO provides the abiotic characterisation of coastal waters (hydrology, hydrodynamics and biogeochemistry), which together yields a comprehensive description of the environment that supports an improved understanding of the biological and ecosystem dynamics related to the threat, hence improved information for decision-making.
- **Augmented coastal observing systems:** Deployment of omics methods developed by EMBRC on the JERICO-S3 multiple platform network, and developing joint service based on these augmented systems.
- **Supersites:** Working together between marine stations and JERICO-S3 coastal observing systems at local and regional scale through jointly establishing super-sites.
- **Joint technological development** of omics-based technologies (bio- and genosensors)

3.6. AQUACOSM-plus

AQUACOSM and AQUACOSM-plus (Network of Leading Ecosystem Scale Experimental AQUatic MesoCOSM Facilities Connecting Rivers, Lakes, Estuaries and Oceans in Europe and beyond) INFRAIA EU projects have been active from 2017-2024. They had an overall objective to provide a European network of mesocosm facilities as integrated RI, covering sites from freshwater to marine environments. Specifically the AQUACOSM projects supported capacity building and networking, and take-up of novel technologies for mesocosm research. They had a science strategy to provide experimental capacity for addressing key environmental issues, also in collaboration with other RIs. (<https://www.aquacosm.eu/>)

In the preparation phase of JERICO-S3 and AQUACOSM-plus projects looked for synergies and planned joint activities. This was achieved especially by combining activities of JERICO-S3 WP4 “Pilot Supersites for innovative coastal monitoring” and AQUACOSM-plus WP8 “Pilot execution of Grand Challenge scenario-testing through bridging scales of experimental and observational RI networks” at selected locations where both projects are active (Baltic Sea, Cretan Sea, NW Mediterranean Sea). Aim was to augment JERICO-S3 time series observations by experimental research of climate change relevant topics.

Collaboration was established with a series of mesocosm experiments reported in detail in JERICO-S3 D4.4 “Assessment of PSS implementation”. Briefly:

- In the Gulf of Finland Pilot Supersite, a mesocosm experiment to study the effect of heatwaves on the Gulf of Finland plankton ecosystem was carried out in 2022. Work included three JERICO-S3 TA projects linked to AQUACOSM partners. Besides detailed studies on how different parts of the plankton communities respond to experimental heat waves, also samples were collected during naturally occurring heat waves, using FerryBoxes automated samplers. Mesocosm studies allowed comparison of various high-frequency sensors and low cost sensors used by these two communities. Specifically, transfer of knowledge and harmonization of competence in using plankton imaging was carried out.
- In the NW Mediterranean Sea Pilot Supersite effects of terrestrial dissolved organic matter input and temperature increase on phytoplankton community responses were investigated in 2021. CNR from the JERICO-S3 consortium participated in the experiment to study the effect of extreme events on phytoplankton by monitoring alkalinity and pH.
- A mesocosm experiment at Cretan Sea Pilot Supersite in spring 2022 provided a test-bed for phytoplankton monitoring methods and guidance on optimum and new phytoplankton sensors. While the aim of this experiment for the AQUACOSM-plus community was to study the effect of episodic introduction of airborne microbes into the marine ecosystem, for the JERICO-S3 community the aim was to use mesocosms to establish new sampling strategies and best practices, with focus on making these transferable to existing in situ platforms of the CRETAN PSS and the Eastern Mediterranean in general.

Collaborations proved the synergies between “experimental” and “observational” communities when studying extreme events, as an example of complex scientific questions hard to study using a single approach only. The results show how experimental simulations can be made more realistic using long term observation records. In turn, experimental results provide insight into which variables are modified during extreme events and at which timescales, providing input for defining sampling strategies for observation systems. By combining and integrating approaches, more reliable results are obtained from research questions that are difficult to investigate.

Another synergy created was learning how different communities approach high frequency measurements. In the experimental realm they may be used for estimating rates, e.g., for production and respiration (in the absence of advection and large scale movements in general), which may be feasible using observations as well. On the other hand, integration of novel online sensors is often more advanced in observational studies and examples of how to perform e.g., high resolution imaging in mesocosms was demonstrated using experiences gained from observational studies originally.

Currently, the AQUACOSM community does not intend to proceed towards establishing a research infrastructure or other legal entity. Consequently, no steps have been taken to formalize the collaboration through a MoC, even if it would be good to maintain the possibility of combining experimental and observational studies in the future, as some coastal marine research questions require both approaches.. Some of the mesocosm facilities will continue as part of EMBRC, but the future of some others is still unclear. It would be worthwhile to keep in mind whether JERICO should also secure the existence of some key experimental research infrastructures.

3.7. GROOM II

GROOM II brings together marine robot operators, scientists, sensor and platform manufacturers, and data managers to share their results, experience and ocean knowledge. It promotes a collaborative approach to collect and share oceanographic data, which includes the complex activity of maintaining at sea over long periods a large number of gliders, as well as long range surface or underwater autonomous vehicles.

JERICO RI is integrating diverse platform types such as fixed buoys, piles, moorings, drifters, FerryBoxes, gliders, HF radars, coastal cable observatories and the associated technologies dedicated to observe and monitor coastal European seas.

In this multiplatform, multiparametric and most importantly multiscale approach, gliders are a key asset considering their characteristics and capabilities. More specifically, gliders can connect different scales from coastal to offshore and from upper layers to deep waters, acting as a “bridge” or a “connection channel” between the different JERICO platforms (buoys, FerryBoxes etc). Although there is relatively little variability among the different types of gliders in the market, technological progress pushes towards custom designs and the development of hybrid platforms which are variants of the existing ones.

Activities during the GROOM FP7 project, funded very early in the life of gliders, significantly contributed in bringing together the glider community. In this framework operators formed a coherent group inside which, practices and experiences were exchanged. However, during the JERICO FP7 and JERICO-NEXT projects there were targeted activities towards the connection of Gliders with the other observing platforms in a holistic and coordinated observing system. Moreover, important issues on data, shared technology (between platforms) and calibration were addressed.

Within both projects, significant efforts have been made to identify specific areas of collaboration aiming at strengthening synergies between the projects and ensuring that their activities complement each other rather than overlap.

The main points detailed in the MoC are summarized below. The draft is annexed to the deliverable (Annex 4).

GROOM II and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Sharing experiences and best practices on data interoperability and metadata standardization;
2. Improving access to gliders for research and innovation purposes.
3. Developing Marine Autonomous System calibration and operational services for both Parties' members and users
4. Organising joint training activities based on the common requirements of the members and users of both Parties

In order to fully achieve the purpose of this Agreement, the Parties will take the following actions:

- Establish fora for cooperation at strategic as well as technical levels;



- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity;
- Establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi- annually where the Parties will inform each other on progress;
- Investigate opportunities for concrete collaboration on the development of standards for the exchange of data and information between the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavors basis);
- Investigate opportunities for the development of common components of use in relation to both Parties;
- Raise awareness of the complementarity of the two initiatives in each of their two communities.
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape
- Establish a working group to interact with industry in a collaborative way as one voice.

Although GROOM community was considered as very relevant to the JERICO-S3 community, since the GROOM II project has ended and the corresponding community is not considering as next steps the continuation either as a loose network or through the ESFRI roadmap, it was decided not to proceed any further with the formulation of the collaboration at this stage. If however the situation will change in the future regarding the evolution of GROOM, the existing work will help as a baseline and starting point for collaboration.



4.CONCLUSIONS

At this stage, a significant dialogue has been established with DANUBIUS-ESFRI, which was identified as our highest priority from the "field matrix" that we developed to prioritize our efforts. This dialogue has resulted in the joint governance project "LandSeaLot" and the signing of a formal Memorandum of Collaboration (MoC).

An intense dialogue has also been initiated with the three ERICs identified as high priority: EMSO, ICOS, and EMBRC. With EMSO, we have formalized the points of collaboration in an MoC, which has been approved by the JERICO community and is now undergoing final checks before formal approval by EMSO-ERIC.

The main points for future collaborations with ICOS have been identified and formalized in a draft MoC. This draft will be further discussed in upcoming joint meetings to refine and finalize the details.

The dialogue with EMBRC has allowed us to define and agree on the main points of collaboration. Additionally, substantial efforts have been made to align strategies and maximize synergies with the AQUACOSM and GROOM communities. Unfortunately, both communities have decided not to proceed towards the legal formalization of their consortia at this stage, however, the work done so far will be beneficial for future cooperative efforts.

5. ANNEXES AND REFERENCES

Annex 1: Memorandum of Collaboration between DANUBIUS and JERICO-S3



Memorandum of Collaboration (MoC)

between

The coordinator of the ESFRI project **DANUBIUS-RI** "International Centre for Advanced Studies on River-Sea Systems" hereafter referred to as DANUBIUS-RI, which is represented for the purpose of signature of this Memorandum of Collaboration by Prof. Adrian Stanica (GeoEcoMar, RO) for itself and in the name and on behalf of partners within the DANUBIUS-RI ESFRI project,

on the one hand,

and

The coordination of the EU funded project **JERICO-S3** "Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability" (hereinafter referred to as "JERICO-S3"), a H2020 European Project, Started on 1st February 2020, which is represented for the purpose of signature of this Memorandum of Collaboration by Laurent Delauney (Ifremer, FR) acting for itself and in the name and on behalf of partners within the JERICO-S3 project.

on the other hand.

Danubius-RI and Consortium JERICO-S3 (hereinafter referred to individually as 'the Party' or collectively as 'the Parties') have expressed their mutual desire to cooperate for collaborating at the interface of their mutual research areas, namely in the transition zone from riverine systems to estuaries and the coastal zone by promoting interoperability of data and services across their respective disciplines, fostering cross-disciplinary access to and use of scientific data, and collaborating on the implementation of shared use of facilities where feasible and of mutual benefit. This coveted collaborative framework is regulated by this Memorandum of Collaboration (hereinafter referred to as "MoC").

Background

Description of other RI:

DANUBIUS-RI's is a European Research Infrastructure that aims to facilitate and contribute excellent science on the continuum from river source to sea; to offer state-of-the art research infrastructure; and to provide the integrated knowledge required to sustainably manage and protect River-Sea Systems. DANUBIUS-RI's Vision is to achieve healthy River-Sea Systems and to advance their sustainable use, in order to live within the planet's ecological limits by 2050.

JERICO-S3, a H2020 project to elaborate further the Joint European Research Infrastructure for Coastal Observation in terms of Sciences, Services and Sustainability aims to bring the JERICO-RI to another level of integration and of relevance for society at large, by adding new innovative infrastructures, while integrating biogeochemical and biological observations in an operational way and increasing its inherent value through cooperation with other providers of coastal observations and information. The overarching target of JERICO-S3 is to provide researchers with continuous and more valuable coastal data and datasets, coupling physical and biological information, as well as extending the cooperation with Marine Infrastructures and projects in Europe (CMEMS, EuroARGO, EMSO, ICOS, EMBRC, EPOS, GROOM II, etc.) and outside Europe (USA, Canada, Australia, New Zealand, etc.).



Strategic collaboration

The Parties, both with a long and well-established reputation in their respective fields of Earth System Observation, consider international collaboration important to improve strategic research areas in order to achieve scientific excellence and to strengthen their research capacity in the area of related riverine and marine observations. The aim of this MoC is to facilitate cooperation between the DANUBIUS-RI and the JERICO S3 consortium in relation to the coordination of observational activities at the land-river-estuary-ocean interface in Europe. This MoC is part of the process to define and formalise the roles and relationship between DANUBIUS-RI and the JERICO-S3 consortium. This will help to clarify their respective roles in contributing to the development of a consistent European observing system in the transition zones between terrestrial, riverine and ocean systems. Simultaneous and consistent information on all components of the system (physics, biogeochemistry, biology) are of course needed to understand it. To achieve this, a collaboration between the DANUBIUS-RI and JERICO-S3 is key. The purpose of this MoC is to define what is the role of each entity and how they will exchange information, for the overall success of the European Earth Observation.

Purpose

Recognising, that JERICO-RI is dedicated to the land-sea interface and DANUBIUS-RI to the river-sea continuum, DANUBIUS-RI and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Define the role of each partner to strengthen the observing capabilities in coastal and shelf zones.
2. Collaborate to develop best practices at the global level in the field of the land-sea continuum.
3. Sharing experiences and best practices on data interoperability and metadata standardisation;
4. Developing integrated (common and complementary) services.
5. Organising joint training activities based on the common requirements of the members and users of both Parties.

It is therefore the purpose of this MoC to create a collaborative framework for ensuring a sustained co-operation between the Parties regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration.

Article 1 -Scope of the MoC

In order to fully achieve the purpose of this Agreement, the Parties will take the following actions:

- Establish fora for cooperation at strategic as well as technical levels;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity and best practices;
- Investigate opportunities for concrete collaboration on the development of standards to increase the interoperability of data and information provided by the infrastructures;
- Exchange of information and other materials (including assistance on a best-efforts basis);
- Raise awareness of the complementarity of the two initiatives in each of their two communities;
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape;
- Influencing the European and national science agendas and future joint funding initiatives;
- Establish a working group to interact with industry in a collaborative way as one voice.
- Building on the LandSeaLot project, establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;



Article 2 - Financing

- 2.1 The collaboration envisaged through this MoC does not involve exchange of funding, either in the form of reimbursement or contribution of funds between the Parties: each Party will cover their own costs in establishing, developing and continuing this relationship. Any endeavour involving reimbursement or contribution of funds between the Parties to the MoC will be handled in accordance with applicable laws, regulations and procedures. Such endeavours will be outlined in separate agreements that shall be made in writing by representatives of both Parties and shall be independently authorised by the appropriate statutory authority.
- 2.2 Nothing in this MoC shall be construed as obligating DANUBIUS-RI or JERICO-S3 to expend money or other resources. By signing this Agreement, neither DANUBIUS-RI nor JERICO-S3 incur any obligation for present or future payment of money in excess of appropriations authorised by law and administratively allocated for work undertaken pursuant to this Agreement.
- 2.3 This document is neither a fiscal nor a funds obligation document, nor does it supplement existing statutory authorities of the signatories.

Article 3 - Confidentiality

- 3.1 Any data or other material not already available in the public domain shall be kept confidential and shall not be disclosed to a third party or used in any commercial project or disclosed orally or in writing without prior written consent from the initial disclosing Party (DANUBIUS-RI members or a member of the Consortium JERICO-S3) of this document or his designated representative. In case of disclosing confidential information to a third party, the third party shall commit to respect such confidentiality obligation by signing an agreement with the provisions set in the MoC.
- 3.2 It is acknowledged that various types of restrictions may exist in relation to confidentiality, such as legislative stipulations and contractual obligations, which may govern the use of data and other materials provided by the parties.
- 3.3 All requests from third parties for data or other material shall be handled on a case by case basis in a separate agreement in accordance with DANUBIUS-RI best practice and JERICO-S3.
- 3.5 It is acknowledged that the parties are subject to Freedom of Information legislation ("Legislation") which requires a party to make certain information available to members of the public on request. Wherever possible, and in accordance with any applicable Code of Practice issued with the Legislation, the parties will consult with each other before making any disclosure pursuant to the Legislation.
- 3.6 All future work which makes use of, is derived from (in part or in whole), or relies on, information and materials provided under this agreement shall also be considered confidential, as per clause 4.1.

Article 4 – Intellectual Property

- 4.1 All Intellectual Property Rights, background technology, know-how, assets and resources deposited with DANUBIUS-RI or JERICO-S3 under this MoC shall and will remain vested in the owning party.
- 4.2 Each party shall indemnify the other party that the Intellectual Property Right has not resulted from the infringement of any third party's legitimate rights. Further, the concerned party shall be liable for any claim made by any third party on the ownership and legality of the use of the Intellectual Property Right which is brought in by that party for the implementation of the activities under this MOU.



- 4.3 Any information derived or created from the information and materials supplied shall be owned by the generating party or owned jointly in the case of joint generation.
- 4.4 The guiding principle is that both parties shall be able to use information and materials for their own business only, subject to clause 4.1 above.
- 4.5 Copyright on any publication resulting from activities under this MoC shall belong to the party of the first author, unless agreed otherwise. Other parties contributing to the publication will be granted the right to reproduce the material for their own purposes.
- 4.6 Termination of this Agreement shall not affect the rights and/or obligations with respect to Intellectual Property Rights, ownership of any patent, copyright of any publication, and 'right to use' arrangements.

Article 5 - Liability

- 5.1 Each Party shall indemnify the other Party against any claims for loss or damage to any property or injury or death to any person, during the course of the work, attributable to the negligence or lack of due skill and care on the part of that party or its employees, agents or sub-contractors.
- 5.2 No Party shall be liable for incidental or consequential damages or losses or any loss of profits, loss of data and loss of contracts or opportunity.
- 5.3 The liability of the Parties under this MoC or any separate agreement arising from collaboration under this, howsoever arising in respect of, or attributable to, any breach, non-observance or non-performance of the Agreement or any error or omission, shall be waived.
- 5.4 Any mutual liability regarding claims of any third parties not involved in this MoC is excluded.

Article 6 - General Provisions

- 6.1 A Party may not assign the rights and obligations arising from this MoC, in whole or in part, without the prior and express written agreement of the other Party.
- 6.2 In case any provision of this MoC is or becomes void, this does not affect the validity of the other provisions of this MoC or the MoC as a whole. The Parties will undertake to replace the ineffective provision by an effective provision which comes as close as possible to the purpose of the ineffective provision.
- 6.3 Nothing in this MoC will be construed as creating a partnership or joint venture.
- 6.4 In case of any dispute or difference between the Parties arising out of or in connection with this Agreement, the Parties hereto shall settle it by mutual agreement. Such effort shall be deemed to have failed when one of the Parties so notifies the other in writing.

Article 7 - Entry into Force and Duration

- 7.1 This MoC shall enter into force on the date of its signature by the last Party and will have effect for a period of maximum 3 (three) years from said date. This MoC shall be revisited after three years after signing unless deemed necessary by unforeseen opportunities or needs.
- 7.2 Either Party may terminate this MoC at any time upon 3 (three) months prior written notice to the other Party giving justifiable reasons for doing so. Activities in progress on the date of such written notice and the rights and obligations ensuing from them shall proceed to completion, unless the Parties otherwise agree in writing.
- 7.3 The Parties shall evaluate the implementation of this MoC after it has been in force for 3 (three) years. On the basis of this evaluation, the Parties may make modifications for the purpose of better fulfilling the objective of this MoC. Any amendment to this MoC shall be the subject of a written agreement.



signed by the duly authorised representatives of both Parties.

Article 8 -Nominated Personnel

General communication between the Parties for the purposes of this MoC shall be addressed to:

DANUBIUS-RI

Scientific notices:

Adrian Stănică, Romanian National Institute of Marine Geology and Geo-ecology - GeoEcoMar
Str. Dimitrie Onciul 23-25, sector 2, 024053
Bucharest, Romania
E-mail: astanica@geoecomar.ro
Tel: +40 21 2522594

JERICO-S3

Scientific notices:

Laurent Delauney, Ifremer Centre de
Bretagne, ZI Pointe du Diable
CS 10070
29280 PLOUZANÉ
E-mail: Jerico@ifremer.fr
Tel: +33 298 224 636

Article 9 - Non-binding Nature of MoC

The Parties agree that apart from Article 3. Confidentiality, Article 5. Intellectual Property and Article 6. Liability, this MoC is non-binding and merely reflects the spirit of what is intended.

Date and Signatures

ADRIAN STĂNICĂ AS 12/07/2024

For and on behalf of DANUBIUS-RI members Date

LAURENT DELAUNEY LD

For and on behalf of Ifremer
and JERICO-S3 members

Date

16/07/2024

Annex 2: Memorandum of Collaboration between EMSO-ERIC and JERICO-S3



Memorandum of Collaboration (MoC)

between

EMSO-ERIC - The European Multidisciplinary Seafloor and water column Observatory represented for the purpose of signature of this Memorandum of Collaboration by its Director General acting on behalf of its members,

on the one hand,

and

The coordination of the EU funded project JERICO-S3 "Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability" (hereinafter referred to as "JERICO-S3"), supporting a long-term initiative, started in 2010, which is represented for the purpose of signature of this Memorandum of Collaboration by Laurent Delauney (Ifremer) acting for itself and in the name and on behalf of partners within the JERICO-S3 project.

on the other hand.

EMSO-ERIC and Consortium JERICO-S3 (hereinafter referred to individually as "the Party" or collectively as "the Parties") have expressed their mutual interest to formalise their collaborative framework at the interface of their mutual research and technological areas, by promoting interoperability of data and services across their respective disciplines of Marine Autonomous Systems and coastal ocean science, fostering cross-disciplinary access to and use of scientific data, and collaborating on the implementation of core services and e-infrastructures for ensuring access to users and stakeholders. This coveted collaborative framework is regulated by this Memorandum of Collaboration (hereinafter referred to as "MoC").

Background

Description of the parties:

The European Multidisciplinary Seafloor and water column Observatory (EMSO) is a European Research Infrastructure Consortium (ERIC) with the aim to explore the oceans, to gain a better understanding of phenomena happening within and below them, and to explain the critical role that these phenomena play in the broader Earth systems. It consists of a system of regional facilities placed at key sites around Europe, from North East to the Atlantic, through the Mediterranean, to the Black Sea with fixed platforms equipped with multiple sensors, placed along the water column and on the seafloor. They constantly measure different biogeochemical and physical parameters that address natural hazards, climate change and marine ecosystems.

JERICO-S3, a H2020 project to elaborate further the Joint European Research Infrastructure for Coastal Observation, and thereby complementing the European RI landscape supporting marine science, and bringing JERICO to an increased level of integration and of relevance for society, by adding new innovative infrastructures, while integrating biogeochemical and biological observations in an operational way and increasing its inherent value through cooperation with other providers of coastal observations and information. The overarching target of JERICO is to provide researchers with continuous valuable coastal data and datasets, coupling physical, chemical and biological information, as well as extending the cooperation with Marine Research Infrastructures (EuroARGO, EMSO, ICOS, EMBRC, EPOS), services and projects in



Europe (CMEMS, EMODnet, GROOM II, etc.) and outside Europe (USA, Canada, Australia, New Zealand, etc.).

Strategic collaboration

The Parties, both with a long and well-established reputation in their respective fields of Earth System Observation, consider international collaboration important to improve strategic research areas in order to achieve scientific excellence and to strengthen their research capacity in the area of related ocean observations. The aim of this MoC is to facilitate cooperation between the EMSO ERIC and the JERICO-S3 consortium in relation to ocean observation with emphasis on fixed platforms in Europe. This MoC is part of the process to define and formalise the roles and relationship between the EMSO ERIC and the JERICO-S3 consortium. This will help to avoid overlapping, and through efficient aligning of efforts to contribute to the development of the European Ocean Observing System (EOOS). The MoC will also provide the basis to increase collaboration between both groups improving efficiency in the EOOS landscape.

Purpose

The purpose of this MoC is to create a collaborative framework for ensuring a sustained co-operation between the Parties regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration.

EMSO ERIC and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Track recording of the collaboration framework, under the initiative of JERICO-S3, with European marine research Infrastructures.
2. Identifying scientific and societal challenges that would benefit from being tackled jointly by the two RIs (ex: climate change, land-coast-offshore continuum, Greening of RI activities, process-driven observations, etc.).
3. Harmonising and aligning our effort related to operation and further development (innovation) of fixed platforms.
4. Defining services to be jointly developed by the parties.
5. Jointly developing an ad-hoc solution for ensuring operation and access to the European fleet of Autonomous Vehicles, from offshore to coastal regions (or reversely), and propose subsequent services and a model for operating them.

Article 1 - Scope of the MoC

In order to achieve the purpose of this MoC, the Parties define the scope as followed:

- Establish fora for strategic cooperation and alignment;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity and best practices;
- Establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;
- Investigate opportunities for concrete collaboration on the development of standards to increase the interoperability of data and information provided by the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavours basis);
- Investigate opportunities for the development of common technology and services components of use in relation to both Parties;
- Raise awareness of the complementarity of the two initiatives in each of their two communities;
- Communicate to the common stakeholders the benefits of the collaboration and the value of marine observing in general;
- Joint interaction with key stakeholders, such as industry, Copernicus, EuroGOOS, on topics of common interests.



To fulfil the scope, the parties envision to (list not restrictive):

- Develop a joint strategy for observing the common domain between the shelf seas and the deep ocean, the slope;
- Jointly develop observing technology of common interest to address common scientific and technological challenges, as for building upon the experience of the EGIM (cEGIM), extending to generic technology such as IoT and AI for smart and augmented observatories, including genomics;
- Jointly address best practices to address common scientific and technological challenges systems such as:
 - fixed platform technology, cables and associated sensors;
 - Jointly address management of data (especially biogeochemical parameters), which are poorly or not at all managed by current Marine data repositories, and progress on best practices on data interoperability and metadata standardisation;
- Creating added-value from sites and observatories contributing to both EMSO and JERICO science strategies;
- Joint management (or at least coordinated approach) of key stakeholders that both RIs have in common, such as CMEMS/EDITO, EuroGOOS, EMODnet, Blue cloud, industry (both technology developers and users of the ocean space);
- Organise joint training activities based on the common requirements of the members and users of both Parties;
- Co-design products and services, as appropriate;
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape.

Article 2 - Financing

- 2.1 The collaboration envisaged through this MoC does not involve exchange of funding, either in the form of reimbursement or contribution of funds between the Parties: each Party will cover their own costs in establishing, developing and continuing this relationship. Any endeavour involving reimbursement or contribution of funds between the Parties to the MoC will be handled in accordance with applicable laws, regulations and procedures. Such endeavours will be outlined in separate agreements that shall be made in writing by representatives of both Parties and shall be independently authorised by the appropriate statutory authority.
- 2.2 Nothing in this MoC shall be construed as obligating the parties to expend money or other resources. By signing this MoC, none of the parties incurs any obligation for present or future payment of money in excess of appropriations authorised by law and administratively allocated for work undertaken pursuant to this MoC.
- 2.3 This document is neither a fiscal nor a funds obligation document, nor does it supplement existing statutory authorities of the signatories.



Article 3 - Confidentiality

- 3.1 Any data or other material not already available in the public domain shall be kept confidential and shall not be disclosed to a third party or used in any commercial project or disclosed orally or in writing without prior written consent from the initial disclosing Party (EMSO ERIC members or a member of the JERICO partnership) of this document or his designated representative. In case of disclosing confidential information to a third party, the third party shall commit to respect such confidentiality obligation by signing an agreement with the provisions set in the MoC.
- 3.2 It is acknowledged that various types of restrictions may exist in relation to confidentiality, such as legislative stipulations and contractual obligations, which may govern the use of data and other materials provided by the parties.
- 3.3 All requests from third parties regarding sharing data and material produced in collaboration of the two parties will require a mutual agreement.
- 3.5 It is acknowledged that the parties are subject to Freedom of Information legislation ("Legislation") which requires a party to make certain information available to members of the public on request. Wherever possible, and in accordance with any applicable Code of Practice issued with the Legislation, the parties will consult with each other before making any disclosure pursuant to the Legislation.
- 3.6 All future work which makes use of, is derived from (in part or in whole), or relies on, information and materials provided under this MoC shall also be considered confidential, as per clause 4.1.

Article 4 – Intellectual Property

- 4.1 All Intellectual Property Rights, background technology, know-how, assets and resources deposited with EMSO ERIC or JERICO under this MoC shall and will remain vested in the owning party.
- 4.2 Each party shall indemnify the other party that the Intellectual Property Right has not resulted from the infringement of any third party's legitimate rights. Further, the concerned party shall be liable for any claim made by any third party on the ownership and legality of the use of the Intellectual Property Right which is brought in by that party for the implementation of the activities under this MoC
- 4.3 Any information derived or created from the information and materials supplied shall be owned by the generating party or owned jointly in the case of joint generation.
- 4.4 The guiding principle is that both parties shall be able to use information and materials for their own business only, subject to clause 4.1 above.
- 4.5 Copyright on any publication resulting from activities under this MoC shall belong to the party of the first author, unless agreed otherwise. Other parties contributing to the publication will be granted the right to reproduce the material for their own purposes.
- 4.6 Termination of this MoC shall not affect the rights and/or obligations with respect to Intellectual Property Rights, ownership of any patent, copyright of any publication, and 'right to use' arrangements.



Article 5 - Liability

- 5.1 Each Party shall indemnify the other Party against any claims for loss or damage to any property or injury or death to any person, during the course of the work, attributable to the negligence or lack of due skill and care on the part of that party or its employees, agents or sub-contractors.
- 5.2 No Party shall be liable for incidental or consequential damages or losses or any loss of profits, loss of data and loss of contracts or opportunity.
- 5.3 The liability of the Parties under this MoC or any separate agreement arising from collaboration under this, howsoever arising in respect of, or attributable to, any breach, non-observance or non-performance of this MoC or any separate agreement or any error or omission, shall be waived.
- 5.4 Any mutual liability regarding claims of any third parties not involved in this MoC is excluded.

Article 6 - General Provisions

- 6.1 A Party may not assign the rights and obligations arising from this MoC, in whole or in part, without the prior and express written agreement of the other Party.
- 6.2 In case any provision of this MoC is or becomes void, this does not affect the validity of the other provisions of this MoC or the MoC as a whole. The Parties will undertake to replace the ineffective provision by an effective provision which comes as close as possible to the purpose of the ineffective provision.
- 6.3 Nothing in this MoC will be construed as creating a partnership or joint venture.
- 6.4 In case of any dispute or difference between the Parties arising out of or in connection with this MoC, the Parties hereto shall settle it by mutual agreement. Such effort shall be deemed to have failed when one of the Parties so notifies the other in writing. In that case, this MoC shall be governed and construed in accordance with the substantive law of Belgium.

Article 7 - Entry into Force and Duration

- 7.1 This MoC shall enter into force on the date of its signature by the last Party and will have effect for a period of maximum 3 (three) years from said date. This MoC shall be renewed by signing a new contract for a new 3 (three) year period under the same conditions with either JERICO or its successor. Renewal does not imply any modification or deferment of existing obligations.
- 7.2 Either Party may terminate this MoC at any time upon 3 (three) months prior written notice to the other Party giving justifiable reasons for doing so. Activities in progress on the date of such written notice and the rights and obligations ensuing from them shall proceed to completion, unless the Parties otherwise agree in writing.
- 7.3 The Parties shall evaluate the implementation of this MoC after it has been in force for 3 (three) years. On the basis of this evaluation, the Parties may make modifications for the purpose of better fulfilling the objective of this MoC. Any amendment to this MoC shall be the subject of a written agreement signed by the duly authorised representatives of both Parties.



Article 8 -Nominated Personnel

General communication between the Parties for the purposes of this MoC shall be addressed to:**EMSO ERIC**

Scientific notices:

Ingrid Puillat, EMSO ERIC
Corporate Headquarters: Via Giunio Antonio Resti, 63 - Rome
Email: info_admin@emso-eu.org, ingrid.puillat@emso-eu.org
Mobile Phone: +39 342 069 2232

Legal notices:

Registered Office: Via di Vigna Murata 605 - Rome
Fiscal Code 97908370584 - VAT Number 14062811006
E-mail: eric-emso@legal.email.it

JERICO-S3

Scientific notices:

Laurent Delauney, Ifremer Centre de
Bretagne, ZI Pointe du Diable
CS 10070
29280 PLOUZANÉ
E-mail: Jerico@ifremer.fr
Tel: +33 298 224 636

Article 9 - Non-binding Nature of MoC

The Parties agree that apart from Article 3. Confidentiality, Article 5. Intellectual Property and Article 6. Liability, this MoC is non-binding and merely reflects the spirit of what is intended.

Date and Signatures




.....
For and on behalf of EMSO ERIC

Date

.....
For and on behalf of Ifremer
and JERICO partnership

.....
Date

Annex 3: Memorandum of Collaboration between ICOS-ERIC and JERICO-S3

 ICOS	 Integrated Carbon Observation System	 JERICO S3 SCIENCE - SERVICES - SUSTAINABILITY
---	---	--

Memorandum of Collaboration (MoC)

between

ICOS (Integrated Carbon Observing System)-ERIC,
either as Coordinator of the EU funded project XXXXXX hereafter referred to as XXXXX, which is represented for the purpose of signature of this Memorandum of Collaboration by XXXXX acting for itself and in the name and on behalf of partners within the XXXXX project,
or other project description to provided from RI

on the one hand,

and

The coordination of the EU funded project JERICO-S3 "Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability" (hereinafter referred to as "JERICO-S3"), a H2020 European Project, Started on 1st February 2020, which is represented for the purpose of signature of this Memorandum of Collaboration by Laurent Delauney (Ifremer) acting for itself and in the name and on behalf of partners within the JERICO-S3 project.

on the other hand.

ICOS-ERIC and Consortium JERICO-S3 (hereinafter referred to individually as "the Party" or collectively as "the Parties") have expressed their mutual desire to cooperate for better addressing the observation of the carbonate system along the land-sea continuum, coastal waters and providing joint fit-for-purpose services to science, decision-makers and society at large, promoting interoperability of data and services. This coveted collaborative framework is regulated by this Memorandum of Collaboration (hereinafter referred to as "MoC").

Background

Description of other RI:

The Integrated Carbon Observation System (ICOS) is a European-wide research infrastructure focused on monitoring greenhouse gases. It provides standardized and open data on greenhouse gas concentrations in the atmosphere, as well as on carbon fluxes between the atmosphere, terrestrial ecosystems, and oceans. This data is collected from over 170 measurement stations across 16 European countries. ICOS's mission is to produce high-precision, long-term observations and facilitate research to better understand the carbon cycle and provide essential information on greenhouse gases. Moreover, ICOS promotes technological developments related to greenhouse gas monitoring by linking research, education, and innovation. The data and insights generated by ICOS support policymakers and stakeholders in making informed decisions to combat climate change and its impacts. ICOS marine stations play a crucial role in monitoring greenhouse gases within the marine environment. These stations are strategically located in the Atlantic Ocean, as well as the Nordic, Baltic, and Mediterranean Seas. The Ocean Thematic Centre (OTC) coordinates the network of ocean stations, providing support and training to help them acquire the highest quality data for studying carbon fluxes and their drivers, ensuring that data collection is both accurate and consistent.

ICOS

Integrated
Carbon
Observation
System



JERICO-S3, a H2020 project to elaborate further the Joint European Research Infrastructure for Coastal Observation in terms of Sciences, Services and Sustainability aims to bring the JERICO-RI to another level of integration and of relevance for society at large, by adding new innovative infrastructures, while integrating biogeochemical and biological observations in an operational way and increasing its inherent value through cooperation with other providers of coastal observations and information. The overarching target of JERICO-S3 is to provide researchers with continuous and more valuable coastal data and datasets, coupling physical and biological information, as well as extending the cooperation with Marine Infrastructures and projects in Europe (CMEMS, EuroARGO, EMSO, ICOS, EMBRC, EPOS, GROOM II, etc.) and outside Europe (USA, Canada, Australia, New Zealand, etc.).

Strategic collaboration

The Parties, both with a long and well-established reputation in the field of Ocean Observation, consider international collaboration important to improve strategic research areas in order to achieve scientific excellence and to strengthen their research capacity in the area of related ocean observations. The aim of this MoC is to facilitate cooperation between ICOS - ERIC and the JERICO-S3 consortium in relation to ocean observation with emphasis on coastal carbon biogeochemistry and its spatial variability. This MoC is part of the process to define and formalise the relationship between ICOS-ERIC and the JERICO-S3 consortium. This will help to provide clarity on their respective roles in contributing to the development of the European Ocean Observing System (EOOS). The MoC will provide the basis to increase collaboration between both groups and maximise impact through coordination reducing the complexity in the EOOS landscape.

Mutual benefits:

As the expert entity on greenhouse gas across environmental domains, ICOS-ERIC is further developing scientifically sound best practices for observing sea surface pCO₂ and quantifying air-sea CO₂ fluxes. JERICO-RI will benefit from pCO₂ data cross validation and interoperability to better address relevant coastal processes (biogeochemical and biological). ICOS will benefit from JERICO-RI through the extension and densification of observations of the carbonate systems in the coastal waters using the JERICO observing systems, and by accessing high spatio-temporal standardised observations of EOVs and EOPs performed by the JERICO-RI.

Purpose

ICOS - ERIC and JERICO-S3 wish to enter into a cooperative relationship for the general purpose of:

1. Sharing experiences and best practices on data interoperability and metadata standardization;
2. Sharing experiences and best practices on ferry-box and fixed platform technology and associated sensors.
3. Organising joint training activities based on the common requirements of the members and users of both Parties.
4. Co-designing of operations and coastal observing systems benefitting from the already existing facilities
5. Co-organizing of intercalibration exercises on variables of common interest through, for example, participation of the JERICO-RI community in pCO₂ oceanic sensors inter-calibration organized by ICOS-RI
6. Co-planning of measurement activity to benefit from cross validation of data and densification of measurements and parameters.

ICOS

Integrated
Carbon
Observation
System



7. Expanding the network reach of each RI by offering their respective facilities/platforms for the installation of sensors related to the research questions and/or other requirements of the respectively other RI..

It is therefore the purpose of this MoC to create a collaborative framework for ensuring a sustained co-operation between the Parties regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration.

Article 1 - Scope of the MoC

In order to fully achieve the purpose of this Agreement, the Parties will take the following actions:

- Establish fora for cooperation at strategic as well as technical levels;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity;
- Establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;
- Investigate opportunities for concrete collaboration regarding the development of standards for the exchange of data and information between the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavors basis);
- Raise awareness of the complementarity of the two initiatives in each of their two communities;
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape.

Article 2 - Financing

- 2.1 The collaboration envisaged through this MoC does not involve exchange of funding, either in the form of reimbursement or contribution of funds between the Parties: each Party will cover their own costs in establishing, developing and continuing this relationship. Any endeavor involving reimbursement or contribution of funds between the Parties to the MoC will be handled in accordance with applicable laws, regulations and procedures. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of both Parties and shall be independently authorized by the appropriate statutory authority.
- 2.2 Nothing in this MoC shall be construed as obligating ICOS-ERIC or JERICO-S3 to expend money or other resources. By signing this Agreement, neither ICOS-ERIC nor JERICO-S3 incur any obligation for present or future payment of money in excess of appropriations authorized by law and administratively allocated for work undertaken pursuant to this Agreement.
- 2.3 This document is neither a fiscal nor a funds obligation document, nor does it supplement existing statutory authorities of the signatories.

Article 3 - Confidentiality

- 3.1 Any data or other material not already available in the public domain shall be kept confidential and shall not be disclosed to a third party or used in any commercial project or disclosed orally or in writing without prior written consent from the initial disclosing Party (ICOS-ERIC members or a member of the Consortium JERICO-S3) of this document or his designated representative. In case of disclosing confidential information to a third party, the third party shall commit to respect such confidentiality obligation by signing an agreement with the provisions set in the MoC.
- 3.2 It is acknowledged that various types of restrictions may exist in relation to confidentiality, such as legislative stipulations and contractual obligations, which may govern the use of data and other materials provided by the parties.
- 3.3 All requests from third parties for data or other material shall be handled on a case by case basis in a separate agreement in accordance with ICOS-ERIC best practice and JERICO-S3.
- 3.5 It is acknowledged that the parties are subject to Freedom of Information legislation ("Legislation") which require a party to make certain information available to members of the public on request. Wherever possible, and in accordance with any applicable Code of Practice issued with the Legislation, the parties will consult with each other before making any disclosure pursuant to the Legislation.
- 3.6 All future work which makes use of, is derived from (in part or in whole), or relies on, information and materials provided under this agreement shall also be considered confidential, as per clause 4.1.

Article 4 – Intellectual Property

- 4.1 All Intellectual Property Rights, background technology, know-how, assets and resources deposited with ICOS-ERIC or JERICO-S3 under this MoC shall and will remain vested in the owning party.
- 4.2 Each party shall indemnify the other party that the Intellectual Property Right has not resulted from the infringement of any third party's legitimate rights. Further, the concerned party shall be liable for any claim made by any third party on the ownership and legality of the use of the Intellectual Property Right which is brought in by that party for the implementation of the activities under this MoC.
- 4.3 Any information derived or created from the information and materials supplied shall be owned by the generating party or owned jointly in the case of joint generation.
- 4.4 The guiding principle is that both parties shall be able to use information and materials for their own business only, subject to clause 4.1 above.
- 4.5 Copyright on any publication resulting from activities under this MoC shall belong to the party of the first author, unless agreed otherwise. Other parties contributing to the publication will be granted the right to reproduce the material for their own purposes.
- 4.6 Termination of this Agreement shall not affect the rights and/or obligations with respect to Intellectual Property Rights, ownership of any patent, copyright of any publication, and 'right to use' arrangements.

ICOS

Integrated
Carbon
Observation
System



Article 5 - Liability

- 5.1 Each Party shall indemnify the other Party against any claims for loss or damage to any property or injury or death to any person, during the course of the work, attributable to the negligence or lack of due skill and care on the part of that party or its employees, agents or sub-contractors.
- 5.2 No Party shall be liable for incidental or consequential damages or losses or any loss of profits, loss of data and loss of contracts or opportunity.
- 5.3 The liability of the Parties under this MoC or any separate agreement arising from collaboration under this, howsoever arising in respect of, or attributable to, any breach, non-observance or non-performance of the Agreement or any error or omission, shall be waived.
- 5.4 Any mutual liability regarding claims of any third parties not involved in this MoC is excluded.

Article 6 - General Provisions

- 6.1 A Party may not assign the rights and obligations arising from this MoC, in whole or in part, without the prior and express written agreement of the other Party.
- 6.2 In case any provision of this MoC is or becomes void, this does not affect the validity of the other provisions of this MoC or the MoC as a whole. The Parties will undertake to replace the ineffective provision by an effective provision which comes as close as possible to the purpose of the ineffective provision.
- 6.3 Nothing in this MoC will be construed as creating a partnership or joint venture.
- 6.4 In case of any dispute or difference between the Parties arising out of or in connection with this Agreement, the Parties hereto shall settle it by mutual agreement. Such effort shall be deemed to have failed when one of the Parties so notifies the other in writing. In that case, this MoC shall be governed and construed in accordance with the substantive law of Belgium.

Article 7 - Entry into Force and Duration

- 7.1 This MoC shall enter into force on the date of its signature by the last Party and will have effect for a period of 3 (three) years from said date. This MoC shall be renewed by signing a new contract for a new 3 (three) year period under the same conditions with either JERICO-S3 or its successor. Renewal does not imply any modification or deferment of existing obligations.
- 7.2 Either Party may terminate this MoC at any time upon 3 (three) months prior written notice to the other Party giving justifiable reasons for doing so. Activities in progress on the date of such written notice and the rights and obligations ensuing from them shall proceed to completion, unless the Parties otherwise agree in writing.
- 7.3 The Parties shall evaluate the implementation of this MoC after it has been in force for 3 (three) years. On the basis of this evaluation, the Parties may make modifications for the purpose of better fulfilling the objective of this MoC. Any amendment to this MoC shall be the subject of a written agreement signed by the duly authorised representatives of both Parties.

Annex 4: Memorandum of Collaboration between GROOM II and JERICO-S3



Memorandum of Collaboration (MoC)

between

ARMINES, as Coordinator of the EU funded project GROOM II "Gliders for Research, Ocean Observations and Management: Infrastructure and Innovation" hereafter referred to as GROOM II, a H2020 European Project, started on 1st October 2020, which is represented for the purpose of signature of this Memorandum of Collaboration by ARMINES acting for itself and in the name and on behalf of partners within the Groom II project,

on the one hand,

and

The coordination of the EU funded project JERICO-S3 "Joint European Research Infrastructure of Coastal Observatories: Science, Service, Sustainability" (hereinafter referred to as "JERICO-S3"), a H2020 European Project, Started on 1st February 2020, which is represented for the purpose of signature of this Memorandum of Collaboration by Laurent Delauney (Ifremer) acting for itself and in the name and on behalf of partners within the JERICO-S3 project.

on the other hand.

GROOM II and Consortium JERICO-S3 (hereinafter referred to individually as "the Party" or collectively as "the Parties") have expressed their mutual desire to cooperate for promoting interoperability of data and services across their respective disciplines of Marine Autonomous Systems and coastal ocean science, fostering cross-disciplinary access to and use of scientific data, and collaborating on the implementation of core services and e-Infrastructures for ensuring access to users and stakeholders. This coveted collaborative framework is regulated by this Memorandum of Collaboration (hereinafter referred to as "MoC").

Background

GROOM II is a H2020 project that aims at designing a European Marine Research Infrastructure (MRI) that will transform fragmented research infrastructures into a sustained organisation offering a world-class service to the global population. Its goal is to connect scientists & industry with oceanographic platform operators & marine system integrators to capture high value ocean data for society.

JERICO-S3, a H2020 project to elaborate further the Joint European Research Infrastructure for Coastal Observation in terms of Sciences, Services and Sustainability aims to bring the JERICO to another level of integration and of relevance for society at large, by adding new innovative infrastructures, while integrating biogeochemical and biological observations in an operational way and increasing its inherent value through cooperation with other providers of coastal observations and information. The overarching target of JERICO-S3 is to provide researchers with continuous and more valuable coastal data and datasets, coupling physical and biological information, as well as extending the cooperation with Marine Infrastructures and projects in Europe (CMEMS, EuroARGO, EMSO, ICOS, EMBRC, EPOS, GROOM II, etc.) and outside Europe (USA, Canada, Australia, New Zealand, etc.).



Strategic collaboration

The Parties, both with a long and well-established reputation in the field of Ocean Observation using Marine Autonomous systems, consider international collaboration important to improve strategic research areas in order to achieve scientific excellence and to strengthen their research capacity in the area of related ocean observations. The aim of this MoU is to facilitate cooperation between the GROOM II and the JERICO S3 consortia in relation to the coordination of glider activity in Europe. This MoU is part of the process to define and formalise the roles and relationship between the GROOM II and the JERICO-DS consortia. This will help to provide clarity on their respective roles in contributing to the development of the European Ocean Observing System (EOOS). The MoU will also provide the basis to increase collaboration between both groups and reduce the complexity in the EOOS landscape. It will be a tool for further discussion in relation to the ESFRI roadmap and interaction with the EuroGOOS Glider Task Team.

Purpose

GROOM II and JERICO-DS wish to enter into a cooperative relationship for the general purpose of:

1. Sharing experiences and best practices on data interoperability and metadata standardization;
2. Improving access to gliders for research and innovation purposes.
3. Developing Marine Autonomous System calibration and operational services for both Parties' members and users
4. Organising joint training activities based on the common requirements of the members and users of both Parties.

It is therefore the purpose of this MoU to create a collaborative framework for ensuring a sustained co-operation between the Parties regarding integration and exchange of data, information, products and knowledge, and thus, reinforcing the added value of European collaboration.

Article 1 -Scope of the MoU

In order to fully achieve the purpose of this Agreement, the Parties will take the following actions:

- Establish fora for cooperation at strategic as well as technical levels;
- Identify areas of potential collaboration and establish mechanisms to create synergies to optimise complementarity;
- Establish regular meetings (virtual or at already scheduled meetings of opportunity) at least semi-annually where the Parties will inform each other on progress;
- Investigate opportunities for concrete collaboration on the development of standards for the exchange of data and information between the infrastructures;
- Exchange of information and other materials (including assistance on a best-endeavors basis);
- Investigate opportunities for the development of common components of use in relation to both Parties;
- Raise awareness of the complementarity of the two initiatives in each of their two communities.
- Collaborate on producing a Joint policy brief on how these Research Infrastructures integrate into the European Marine Research Infrastructure landscape
- Establish a working group to interact with industry in a collaborative way as one voice.



Article 2 - Financing

- 2.1 The collaboration envisaged through this MoU does not involve exchange of funding, either in the form of reimbursement or contribution of funds between the Parties: each Party will cover their own costs in establishing, developing and continuing this relationship. Any endeavor involving reimbursement or contribution of funds between the Parties to the MoU will be handled in accordance with applicable laws, regulations and procedures. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of both Parties and shall be independently authorized by the appropriate statutory authority.
- 2.2 Nothing in this MoU shall be construed as obligating GROOM II or JERICO-DS to expend money or other resources. By signing this Agreement, neither GROOM II nor JERICO-DS incur any obligation for present or future payment of money in excess of appropriations authorized by law and administratively allocated for work undertaken pursuant to this Agreement.
- 2.3 This document is neither a fiscal nor a funds obligation document, nor does it supplement existing statutory authorities of the signatories.

Article 3 - Confidentiality

- 3.1 Any data or other material not already available in the public domain shall be kept confidential and shall not be disclosed to a third party or used in any commercial project or disclosed orally or in writing without prior written consent from the initial disclosing Party (GROOM II members or a member of the Consortium JERICO-DS) of this document or his designated representative. In case of disclosing confidential information to a third party, the third party shall commit to respect such confidentiality obligation by signing an agreement with the provisions set in the MoU.
- 3.2 It is acknowledged that various types of restrictions may exist in relation to confidentiality, such as legislative stipulations and contractual obligations, which may govern the use of data and other materials provided by the parties.
- 3.3 All requests from third parties for data or other material shall be handled on a case by case basis in a separate agreement in accordance with GROOM II best practice and JERICO-DS.
- 3.5 It is acknowledged that the parties are subject to Freedom of Information legislation ("Legislation") which require a party to make certain information available to members of the public on request. Wherever possible, and in accordance with any applicable Code of Practice issued with the Legislation, the parties will consult with each other before making any disclosure pursuant to the Legislation.
- 3.6 All future work which makes use of, is derived from (in part or in whole), or relies on, information and materials provided under this agreement shall also be considered confidential, as per clause 4.1.



Article 4 – Intellectual Property

- 4.1 All Intellectual Property Rights, background technology, know-how, assets and resources deposited with GROOM II or JERICO-DS under this MoU shall and will remain vested in the owning party.
- 4.2 Each party shall indemnify the other party that the Intellectual Property Right has not resulted from the infringement of any third party's legitimate rights. Further, the concerned party shall be liable for any claim made by any third party on the ownership and legality of the use of the Intellectual Property Right which is brought in by that party for the implementation of the activities under this MOU.
- 4.3 Any information derived or created from the information and materials supplied shall be owned by the generating party or owned jointly in the case of joint generation.
- 4.4 The guiding principle is that both parties shall be able to use information and materials for their own business only, subject to clause 4.1 above.
- 4.5 Copyright on any publication resulting from activities under this MoU shall belong to the party of the first author, unless agreed otherwise. Other parties contributing to the publication will be granted the right to reproduce the material for their own purposes.
- 4.6 Termination of this Agreement shall not affect the rights and/or obligations with respect to Intellectual Property Rights, ownership of any patent, copyright of any publication, and 'right to use' arrangements.

Article 5 - Liability

- 5.1 Each Party shall indemnify the other Party against any claims for loss or damage to any property or injury or death to any person, during the course of the work, attributable to the negligence or lack of due skill and care on the part of that party or its employees, agents or sub-contractors.
- 5.2 No Party shall be liable for incidental or consequential damages or losses or any loss of profits, loss of data and loss of contracts or opportunity.
- 5.3 The liability of the Parties under this MoU or any separate agreement arising from collaboration under this, howsoever arising in respect of, or attributable to, any breach, non-observance or non-performance of the Agreement or any error or omission, shall be waived.
- 5.4 Any mutual liability regarding claims of any third parties not involved in this MoU is excluded.

Article 6 - General Provisions

- 6.1 A Party may not assign the rights and obligations arising from this MoU, in whole or in part, without the prior and express written agreement of the other Party.
- 6.2 In case any provision of this MoU is or becomes void, this does not affect the validity of the other provisions of this MoU or the MoU as a whole. The Parties will undertake to replace the ineffective provision by an effective provision which comes as close as possible to the purpose of the ineffective provision.
- 6.3 Nothing in this MoU will be construed as creating a partnership or joint venture.
- 6.4 In case of any dispute or difference between the Parties arising out of or in connection with this Agreement, the Parties hereto shall settle it by mutual agreement. Such effort shall be deemed to have failed when one of the Parties so notifies the other in writing. In that case, this MoU shall be governed and construed in accordance with the substantive law of Belgium.



Article 7 - Entry into Force and Duration

- 7.1 This MoU shall enter into force on the date of its signature by the last Party and will have effect for a period of 3 (three) years from said date. This MoU shall be renewed by signing new contract for a new 3 (three) year periods under the same conditions with either JERICO-DS or its successor. Renewal does not imply any modification or deferment of existing obligations.
- 7.2 Either Party may terminate this MoU at any time upon 3 (three) months prior written notice to the other Party giving justifiable reasons for doing so. Activities in progress on the date of such written notice and the rights and obligations ensuing from them shall proceed to completion, unless the Parties otherwise agree in writing.
- 7.3 The Parties shall evaluate the implementation of this MoU after it has been in force for 3 (three) years. On the basis of this evaluation, the Parties may make modifications for the purpose of better fulfilling the objective of this MoU. Any amendment to this MoU shall be the subject of a written agreement signed by the duly authorised representatives of both Parties.

Article 8 - Nominated Personnel

General communication between the Parties for the purposes of this MoU shall be addressed to:

GROOM II

...TBD...

Scientific notices:

Legal notices:

E-mail:

Tel:

JERICO-DS

Scientific notices:

Laurent Delauney, Ifremer Centre de Bretagne,

ZI Pointe du Diable

CS 10070

29280 PLOUZANÉ

E-mail: Jerico-

DS@ifremer.fr Tel: +33 298

224 636

Legal notices:

Marine Falhun, Ifremer Centre de Bretagne

E-mail: marine.falhun@ifremer.fr

Tel: +22 2 98 22 43 51



Article 9 - Non-binding Nature of MoU

The Parties agree that apart from the Article 3. Confidentiality, Article 5. Intellectual Property and Article 6. Liability, this MoU is non-binding and merely reflects the spirit of what is intended.

Date and Signatures

.....
For and on behalf of GROOM II members Date

.....
For and on behalf of Ifremer
and JERICO-DS members Date

DRAFT