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Joint European Research Infrastructure network for Coastal Observatory Science, Services, Sustainability	
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→ Please specify the type of milestone:

- Report after a workshop or a meeting (TEMPLATE A)
- Report after a specific action (TEMPLATE B) (test, diagnostic, implementation,...)**
- Document (TEMPLATE B) (guidelines,...)
- Other (TEMPLATE B) (to specify) TABLE

Diffusion list			
<u>Consortium beneficiaries</u>	Third parties	Associated Partners	other

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TABLE OF CONTENT

TABLE OF CONTENT	2
A) TEMPLATE B - Other cases (not a workshop or meeting report)	3
1. B - Objectives	3
2. B and implementation process	3
3. B - Main report	5
4. B - Conclusion	8
4.1. Synthesis of main conclusion	8
4.2. Next steps (work plan)	8

A) TEMPLATE B - Other cases (not a workshop or meeting report)

1.B - Objectives

The general aim of WP5 is to progress towards the highest “readiness level” on harmonisation in the JERICO-RI with a coordinated and interactive implementation of multiplatform and multidisciplinary best practices among the RI operators. Different actions have been developed for improving the management of both operations and data management of the different coastal observing platforms. The specific objective here is to establish a method for an integrated monitoring of the harmonisation in JERICO infrastructure observing networks. The link with Key Performance Indicators will allow to perform a near real time update of the assessment both of the different observational networks operations, and of the integration of the data produced in the different services and products performed by JERICO-RI.

2.B and implementation process

The Global Ocean Observing System (GOOS) has established a framework to ensure that ocean observations are effective and beneficial. This framework includes readiness levels for various aspects of ocean observing, such as requirements processes, coordination of observational elements, and data management & information products (Figure 1). As a first step, during the Kick-off meeting of JERICO-S3 (San Sebastian, January 2021), this dashboard has been discussed and adapted to the integrated coastal infrastructure tackled by JERICO-RI. Then, Key Platform Performance Indicators (KPPIs) and Key Integration Performance Indicators (KIPIs) have been defined to support the harmonization of the operations and integration of the different observational elements of the infrastructure (D5.7). Finally, the design of the JERICO Coastal Ocean Resource Environment (JERICO-CORE) opens the door to automatize a dashboard that can cover both the monitoring of the harmonization for the different observational networks (HF Radar, Fixed Platform, Ferrybox, Glider) and their integration into the JERICO services.

FRAMEWORK PROCESSES BY READINESS LEVELS

Readiness Levels	Requirements Processes	Coordination of Observational Elements	Data Management & Information Products
Mature			
Level 9 "Sustained"	Essential Ocean Variable: • Adequate sampling specifications • Quality specifications	System in Place: • Globally • Sustained indefinitely • Periodic review	Information Products Routinely Available: • Product generation standardized • User groups routinely consulted
Level 8 "Mission qualified"	Requirements "Mission Qualified": • Longevity/stability • Fully scalable	System "Mission Qualified": • Regional implementation • Fully scalable • Available specifications and documentation	Data Availability: • Globally available • Evaluation of utility
Level 7 "Fitness for purpose"	Validation of Requirements: • Consensus on observation impact • Satisfaction of multiple user needs • Ongoing international community support	Fitness-for-Purpose of Observation: • Full-range of operational environments • Meet quality specifications • Peer review certified	Validation of Data Policy • Management • Distribution
Pilot			
Level 6 "Operational"	Requirement Refined: • Operational environment • Platform and sensor constraints	Implementation Plans Developed: • Maintenance schedule • Servicing logistics	Demonstrate: • System-wide availability • System-wide use • Interoperability
Level 5 "Verification"	Sampling Strategy Verified: • Spatial • Temporal	Establish: • International commitments and governance • Define standardized components	Verify and Validate Management Practices: • Draft data policy • Archival plan
Level 4 "Trial"	Measurement Strategy Verified at Sea	Pilot project in an operational environment	Agree to Management Practices: • Quality control • Quality assurance • Calibration • Provenance
Concept			
Level 3 "Proof of concept"	Proof of Concept via Feasibility Study: • Measurement strategy • Technology	Proof of Concept Validated: • Technical review • Concept of operations • Scalability (ocean basin)	Verification of Data Model with Actual Observational Unit
Level 2 "Documentation"	Measurement Strategy Described • Sensors • Sensitivity • Dependencies	Proof of Concept: • Technical capability • Feasibility testing • Documentation • Preliminary design	Socialization of Data Model • Interoperability strategy • Expert review
Level 1 "Idea"	Environment Information Need and Characteristics Identified: • Physical • Chemical • Biological	System Formulation: • Sensors • Platforms • Candidate technologies • Innovative approaches	Specify Data Model • Entities, Standards • Delivery latency • Processing flow

Figure 1. Framework Processes for varying Levels of Readiness defined by GOOS (goosocean.org).

3.B - Main report

The Readiness levels defined by the Steering Teams of JERICO Mature platforms, in collaboration with WP6, and as a first step to evaluate the harmonisation among the different observational networks are the following:

		Pan-European Coordination of Observational Elements	Data Management & Information products
Mature	Level 9	Periodic review	Information products routinely available
	Level 8	Regional implementation of the Best Practices	Data availability globally available
	Level 7	Best Practices are defined	Validation of Data Policy
Pilot	Level 6	Procedures are documented Maintenance plan	Demonstrator of data flow following the agreed practices
	Level 5	A network is in place	How to store the data is defined (archival plan)
	Level 4	Pilot platforms/sensors are in operations	Agree to Management Practices (QC, QA, Calibration, Provenance)
Concept	Level 3	A prototype validated on the field	First data sets are produced from the field and fitting the data model
	Level 2	Feasibility test done / preliminar design done	Expert interaction and interoperability check of the data model
	Level 1	System formulation (sensors, platforms, candidate technologies, innovative approaches)	Specification on internal data model taking into account existing standards

Figure 2. Framework Processes for varying Levels of Readiness for JERICO observational infrastructures.

The previously introduced KPPIs and KIPIs allows to monitor both the performance of a specific platform network, and the integration of the data produced in the integrated services that JERICO-RI will provide.

Some observing networks already developed some capabilities to centralise the information (metadata of the platforms and data flow). As shown by the D2PTS pilot demonstration (D7.5), thanks to the efforts coordinated by the EuroGOOS HFR Task Team (<https://eurogoos.eu/high-frequency-radar-task-team/>) and with contributions from JERICO-NEXT and JERICO-S3 projects, a mature level of homogenization and standardization of operations and products has been achieved by the European HFR Node and community, mainly based on a core of shared best practices (Mantovani et al., 2020), documentation and software tools.

The European HFR Node is currently processing data from different data operators and the data from those HFR operators is archived in the HFR Node database. An interactive shiny app (www.hfrnode.eu/map/) has been created to offer data users and providers the possibility to see in a unique server (portal), information on all HFR systems compliant with the required harmonisation process and connected to the European HFR Node (Figure 3).

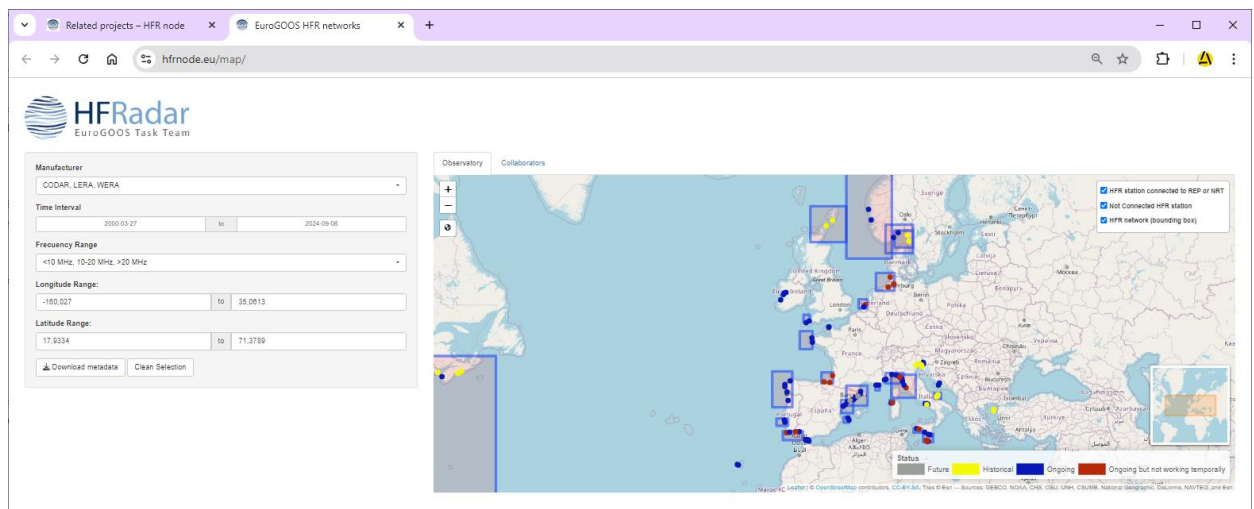


Figure 3. NRT visualisation of the HF Radar platform compliant with the standards.

Moreover, some of the KPPIs has been already integrated in the HF radar Online Outage Reporting Tool previously developed from the EuroSea project by SOCIB, including the %uptime, %maintenance stops, %closed outages (Figure 4) as defined in the framework of JERICO S3 for all mature platforms (D5.7).

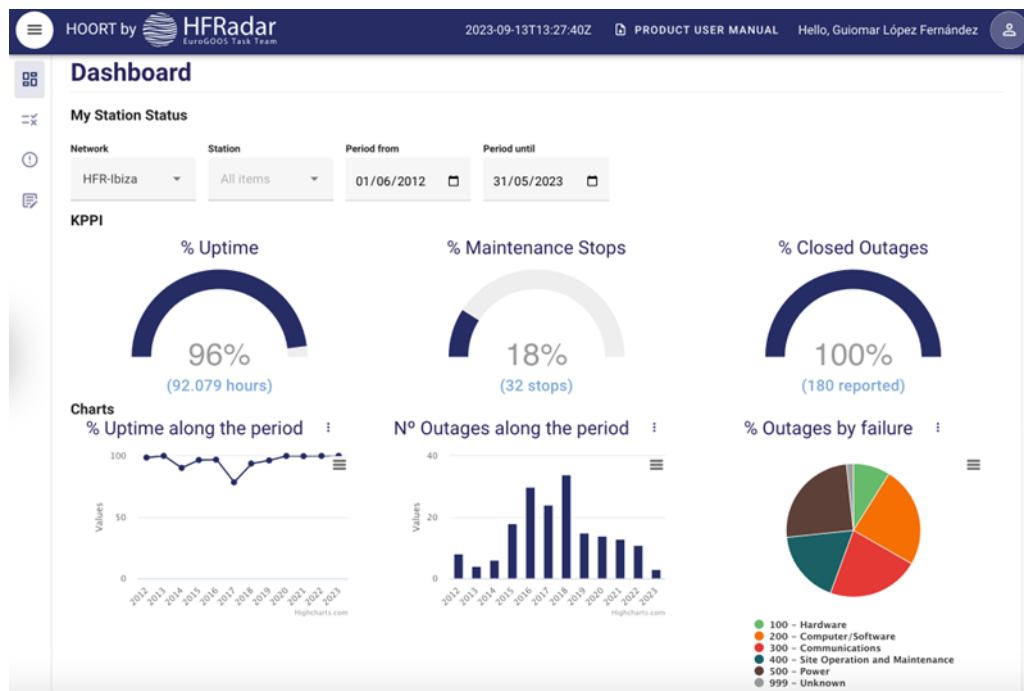


Figure 4- Key Platform Performance Indicators available in the Dashboard.

JERICO-S3 and JERICO-DS have built the JERICO Coastal Ocean Resource Environment (JERICO-CORE), formerly known as e-JERICO, as the unified central hub of JERICO to discover, access, manage and interact with JERICO resources including services, datasets, software, tools, best practices, manuals, publications, organisations, projects, observatories, equipment, data servers, e-libraries, training, and similar assets (See details in D7.6). This environment will allow to connect all the resources dealing with the harmonisation of a specific platform like the HF radar allowing the possibility to obtain an harmonised dashboard for all the platforms having achieved a necessary readiness level in both “Pan-European Coordination of Observational Elements” and “Data Management & Information products”.

Finally, the designed central hub JERICO-CORE will also allow to integrate in a dashboard the defined KIPs related to the integration of the data produced by a platform into JERICO-RI services.

During JERICO DAYS #2 (Lisbon 30 June 2022) discussions took place for reinforcing the link between the technical steering groups of Jerico-S3 and the EuroGOOS Task Teams in order to push the implementation of the harmonisation.

4.B - Conclusion

4.1. *Synthesis of main conclusion*

The proposed dashboard will allow a diagnostic at European level on both the performance of the different platforms in a harmonised network, and the performance of their integration of the different services controlled and managed in JERICO-CORE. The capability has been demonstrated in the specific case of the HF radar network.

4.2. *Next steps (work plan)*

The JERICO Design Study allowed to progress in the design of JERICO-CORE. The future preparation phase should provide a first operational version of the established dashboard for integrating extended versions of the tools of the different observational networks.

A collaboration with the different observing networks community for showcasing and extending the example of HF radar will be pursued in the framework of the EuroGOOS Task Teams. It will be important to ensure a progressive implementation of the harmonisation and the impacts of future JERICO-RI services.