



**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-s3@ifremer.fr

<b>JERICO-S3 MILESTONE</b>	
Joint European Research Infrastructure network for Coastal Observatory <b>Science, Services, Sustainability</b>	
<b>MS#, WP# and full title</b>	JERICO-S3 MS.14 - WP3 - "Integrated Regional Sites All Region Workshop during the Jerico Week"
<b>5 Key words</b>	Integrated regional sites, All region workshop
<b>Lead beneficiary</b>	NIVA
<b>Lead Author</b>	Martin Pfannkuchen
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<b>Contributors</b>	
<b>Submission date</b>	10.07.2022

→ **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) .....

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

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## TABLE OF CONTENT

A) TEMPLATE A - report after a workshop or a meeting	3
1. A - Attendees	3
2. A - Statement of Decisions	3
3. A - Agenda A - Main report	3
4. A - Conclusions	3
5. A - Annexes and references	3

## A) Report after an All Region Workshop During the JERICO Days 2022

Representatives of all Integrated Regional Sites (IRS) attended the JERICO days 2022 in Lisbon TOPics discussed where the possible interactions between PSSes and IRSes including knowledge transfer and and possible regional integration. A second prominent topic was FAIR data and data handling policies/experiences in the IRSes as well a planned advancements in FAIR data in the regions.

### 1. A - Attendees

APELIDO	NOME	INSTITUIÇÃO	EMAIL	Tuesday 28th JUNE	Wednesday 29th JUNE	Thursday 30th JUNE
1	ARTIGAS	Luis Felipe	CNRS-LOG ULCO	felipe.artigas@univ-littoral.fr		
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14	DEL RIO FERNANDEZ	Joaquin	UPC	joaquin.del.rio@upc.edu	<i>Joaquin Del Rio</i>	<i>Joaquin Del Rio</i>
15	DELAUNEY	Laurent	Ifremer		<i>Laurent Delauney</i>	<i>Laurent Delauney</i>
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30	KOSTNER	Nicole	STAC member		Nicole	Nicole	Nicole
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56	SIMPSON	Pauline	UNESCO/IOC-IODE	p.simpson@unesco.org	Pauline	Pauline	Pauline
57	SOLABARRIETA	Lohitzune	AZTI		Lohitzune	Lohitzune	Lohitzune
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58	VITORINO	João	IH	joao.vitorino@hidrografico.pt	João	João	João
59	VOYNOVA	Yoana	Hereon	Yoana.Voynova@hereon.de	Yoana	Yoana	Yoana
60	ZACARIAS	Nuno	IH		Nuno	Nuno	Nuno
61	OLIVEIRA	Anabela	IH		Anabela	Anabela	Anabela
62	PALMA	Cátia	IH		Cátia	Cátia	Cátia
63	BARROQUEIRO	Teotónio	IH		Teotónio	Teotónio	Teotónio
64	LAMAS	Luísa	IH		Luísa	Luísa	Luísa
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## ***2.A - Statement of Decisions***

Data fairness is of growing importance and part of the JERICO strategy. All regions and IRSes were informed about the JERICO approach towards data FAIRness and will work towards regional implementation of FAIR data handling, which will contribute to the final deliverables of WP3.

Collaboration between IRSes and PSSes towards a common understanding of Scientific goals and key challenges is of key importance for the advancement towards the JERICO-RI. Collaboration between WP3 and WP4 will support the final deliverable of WP3 and WP4.

## ***3.A - Main report***

The following presentations by Peter Thijsse and Jukka Seppala prepared and informed the WP3 and IRS discussions:



# JERICO-DAYS 2022

Elaborating on interactions between PSSs and IRSs

**WP1 , PSSs and IRSs (WP3, WP4)**

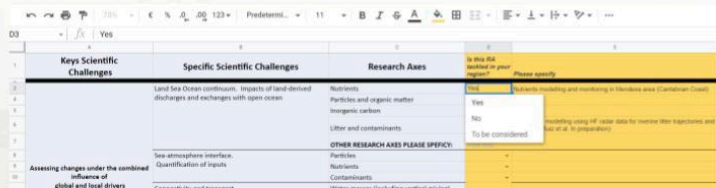


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## Research Axis list - REVIEW

We propose a 3-step process:

1- [Excel template](#) to be reviewed today and started to be completed by regions:



Keys Scientific Challenges	Specific Scientific Challenges	Research Axes	Is this RA included in your report?
Land sea Ocean continuum: impacts of land derived discharges and exchanges with open ocean	Nutrients Particles and organic matter Inorganic carbon Litter and contaminants	Nutrients Particles and organic matter Inorganic carbon Litter and contaminants	Yes
			No
			To be considered
Sea atmosphere interface: Quantification of inputs Assessing changes under the combined influence of global and local drivers	Sea atmosphere interface: Quantification of inputs Connectivity and transport	Particles Nutrients Contaminants Water masses (including vertical mixing)	Yes
			No
			To be considered

2- Finishing completion by regions - end of JULY

3- Analysis of inputs by WP1 (in collaboration with WP3 and WP4)

- Analysing synergies between regions
- Analysing the contribution of RAs and SCs to societal challenges



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Keys Scientific Challenges	Specific Scientific Challenges	Research Axes
Assessing changes under the combined influence of global and local drivers	Land Sea Ocean continuum. Impacts of land-derived discharges and exchanges with open ocean	Nutrients, particles and organic matter, inorganic carbon, litter and contaminants
	Sea-atmosphere interface. Quantification of inputs. Connectivity and transport. Pathways of water masses and materials	Particles, nutrients, contaminants
	Biodiversity trends	Water masses (including vertical mixing), nutrients, contaminants, particles, organisms (connectivity)
Assessing the impacts of extreme events	Ecosystem biogeochemical processes and interactions	Phytoplankton, zooplankton, benthos
	Carbon budget and carbonate system	Biophysical interactions, Biogeochemical functioning, Pelagic, benthic, pelagic/benthic coupling
Unravelling and predicting the impacts of natural and anthropogenic changes	Resolving climate change impacts	Carbon fluxes and budget, carbonate system trends, effects of acidification
	Resolving anthropogenic impacts	Floods, storms/large waves, heat/cold waves, landslides/sudden erosion, tsunamis, volcanic eruptions, harmful algae / jelly fish blooms, accidental pollution, Interactions between events
	Disentangling impacts/scales	Temperature, salinity, currents, sea level rise, waves, biological productions, species distribution ranges (biogeography), nutrients
		Eutrophication, habitat and biodiversity loss, contamination, coastal engineering, use of marine space (including windfarming), use of marine nonliving resources, use/cultivation of living resources, invasive species, maritime traffic, (micro) plastics, acoustic and electromagnetic noises
		Meta analysis , coupled modelling

Introduction

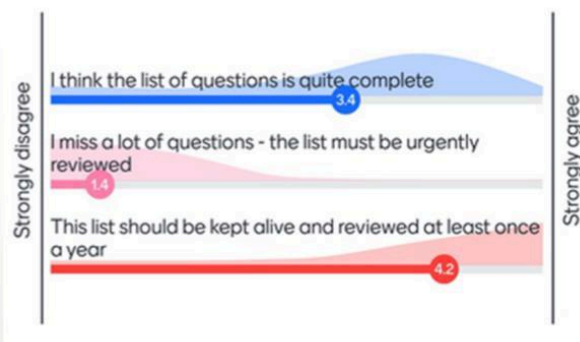


Table IV: Current status after the JERICO week #2 of: (1) the formulations of JERICO-RI Key Scientific Challenges, and (2) their subdivisions in Specific Scientific Challenges and Research Axes

JERICO-S3 D1.1 – WP1 - First analysis of the JERICO-S3 scientific monitoring and regional approaches. Early inputs toward sustainability.

Context - past surveys

Date	target	Aim	Output
April 2020	IRS and PSSs leads	Observations and monitoring in relation with KSCs and SSCs (S3 WP3,WP4)	What are the observational gaps and what are we are addressing in terms of observations? D3.1, D4.1, ESFRI application
May 2021- Feb 2022	Nations representatives (gather information from high level stakeholders)	Collection of national inputs through NRs on a list of predefined topics (based on KSCs) Priority and implementation levels (DS WP1)	Collect national scientific priorities and societal needs for D1.1-Preliminary report for long-term scientific plan
Jan 2022 - March 2022	Nations representatives	Technical design and technology outlook based on the list of KSC and SSCs (DS WP2)	Listing of institutions/infrastructures by country National Coordination, synergies with other observational efforts, integration technology, calibration BPs, Technical competences, ambitions on observation capacities (10 years)
June 2022-	IRSs and PSSs (leads and scientists)	Scientific perspective. Review the list of Research Actions, societal needs related to the SSCs, IRSs and PSSs interactions and added value of JERICO-RI	Early inputs for D1.2 D1.2 : Regional approach [M36] - Analysis of how JERICO addresses regional specificities (requirements, gaps and opportunities), with design specification of the measurement systems, as well as specification of common products and services answering common key challenges.



**Research Axis list - REVIEW**

We propose a 3-step process:

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Keys Scientific Challenges	Specific Scientific Challenges	Research Axes	Is this RA suitable in your region?
Land Sea Ocean continuum. Impacts of land-derived discharges and exchanges with open ocean	Nutrients Particles and organic matter Inorganic carbon	Nutrients	Yes
		Particles and organic matter	Yes
		Inorganic carbon	No
Sea atmosphere interface. Quantification of inputs	Nutrients Particles Contaminants	Nutrients	To be considered
		Particles	To be considered
		Contaminants	To be considered
Assessing changes under the combined influence of global and local drivers	Connectivity and transport.	Water masses (including vertical mixing)	To be considered
			To be considered

2- Finishing completion by regions - end of JULY

3- Analysis of inputs by WP1 (in collaboration with WP3 and WP4)

- Analysing synergies between regions
- Analysing the contribution of RAs and SCs to societal challenges

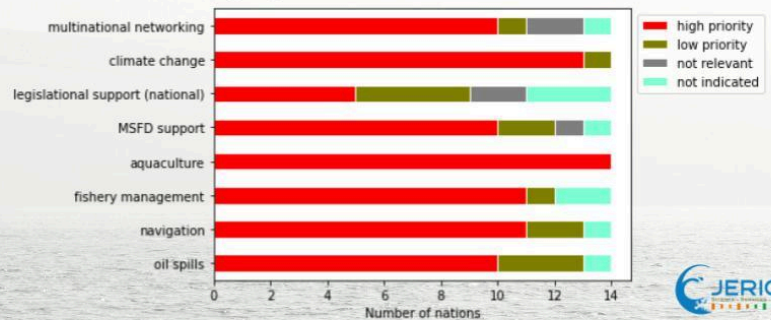


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For today, we propose to prioritize three of the SSC:

- Land Sea Ocean continuum. Impacts of land-derived discharges and exchanges with open ocean**
- Connectivity and transport- Pathways of water masses and Materials**
- Carbon budget and carbonate system**

*Identifying Common National Societal Needs*



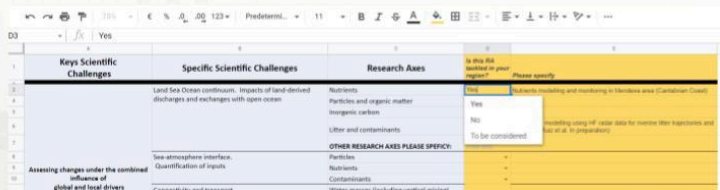
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Assessing changes under the combined influence of global and local drivers	Land Sea Ocean continuum: Impacts of land-derived discharges and exchanges with open ocean	Nutrients Particles and organic matter Inorganic carbon Litter and contaminants	Yes No To be considered
	Sea atmosphere interface: Quantification of inputs	Particles Nutrients Contaminants	
	Connectivity and transport.	Water masses (including vertical mixing)	

2- Finishing completion by regions - end of JULY

3- Analysis of inputs by WP1 (in collaboration with WP3 and WP4)

- Analysing synergies between regions
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This work was supported by the JERICO-S3 and JERICO-DS project. These project have received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement n° 871153/951799.



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# JERICO-Days WP6

## FAIR Data in IRS and PSS

Wednesday, June 29 2022

<number  
>

### WORKSHOP ON FAIRness Evaluation in IRS and PSS

#### Outline

1. Context and short introduction to machine FAIRness of data (Peter)
  - Growing need for data FAIRness
  - FAIR Principles
  - Context of the dataflow in a PSS
  - Example of optimised FAIRness in SDN CDI
  - Evaluating FAIRness of data in the PSS/IRS
1. PSS North Sea and Channel example of generating a dataproduct and FAIRness evaluation (Anouk)
2. Discussion about FAIRness in IRS and PSS (All)
  - Which IRS/PSS's have developed similar data products and have done a data collection?
  - What are the experiences in the IRS/PSS with the Findability/Accessibility of data?
1. Conclusions and actions (Peter)

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ber>

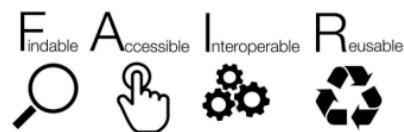


## 1. Growing need for data FAIRness

Click to add Title

Research and observation data should be more and more FAIR

**"Findable Accessible Interoperable Reusable" for machines**



This is driven by:

- Internet and cloud processing possibilities
  - EOSC
  - Blue-Cloud
  - VRE's/Jupyter notebooks
- Research requirements for reproducibility and traceability
- Growing data availability and need for better findability of data
- And on the other side the cost of observation data and benefit of multiple use.

=> In the marine domain this has always been important.

## 2. Measured via FAIR Principles

### Findable

- [F1. \(Meta\)data are assigned a globally unique and persistent identifier](#)
- [F2. Data are described with rich metadata \(defined by R1 below\)](#)
- [F3. Metadata clearly and explicitly include the identifier of the data they describe](#)
- [F4. \(Meta\)data are registered or indexed in a searchable resource](#)

### Accessible

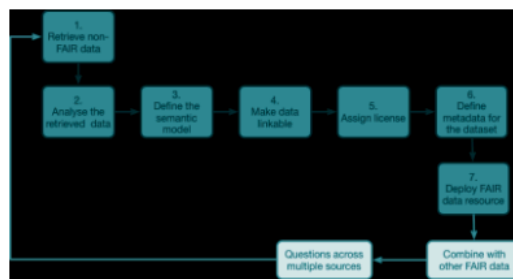
- [A1. \(Meta\)data are retrievable by their identifier using a standardised communications protocol](#)
  - [A1.1 The protocol is open, free, and universally implementable](#)
  - [A1.2 The protocol allows for an authentication and authorisation procedure, where necessary](#)
- [A2. Metadata are accessible, even when the data are no longer available](#)

### Interoperable

- [I1. \(Meta\)data use a formal, accessible, shared, and broadly applicable language for knowledge representation](#)
- [I2. \(Meta\)data use vocabularies that follow FAIR principles](#)
- [I3. \(Meta\)data include qualified references to other \(meta\)data](#)

### Reusable

- [R1. \(Meta\)data are richly described with a plurality of accurate and relevant attributes](#)
- [R1.1. \(Meta\)data are released with a clear and accessible data usage license](#)
- [R1.2. \(Meta\)data are associated with detailed provenance](#)
- [R1.3. \(Meta\)data meet domain-relevant community standards](#)



FAIRification process from Go-FAIR.org



<number>

### 3. Context of the dataflow in a PSS/IRS

Click to add Title

Dataflow complexity:

- Many different platforms, sensors, parameters
- First time use of data in originators institutes for monitoring, research, etc., incl real-time and near-real time.
- Storage and validation in national data centers for re-use (nationally and/or internationally)
- In some cases direct storage/validation in international thematic centers (Euro-Argo, Gliders, HF Radar, ..)
- Publishing data to EU aggregators: EMODNet, SeaDataNet
- Uptake in many different data/information products
- And now also used in EO SC, Blue-Cloud and other Virtual Research Environments (VRE's)

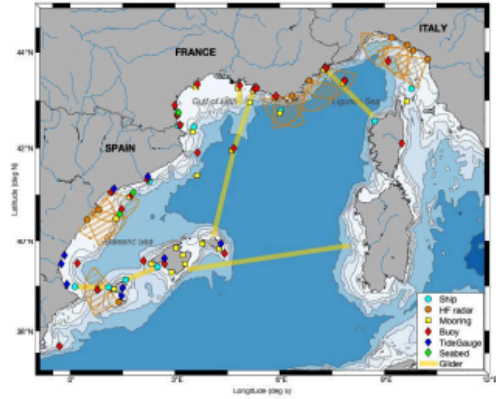


Figure: Overview North-West Mediterranean Pilot Supersite

=> See also overview picture on next slide - from Blue-Cloud



### 3. Context of the dataflow in a PSS/IRS

Click to add Title

Dataflow complexity:

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- And now also used in EOOSC, Blue-Cloud and other Virtual Research Environments (VRE's)

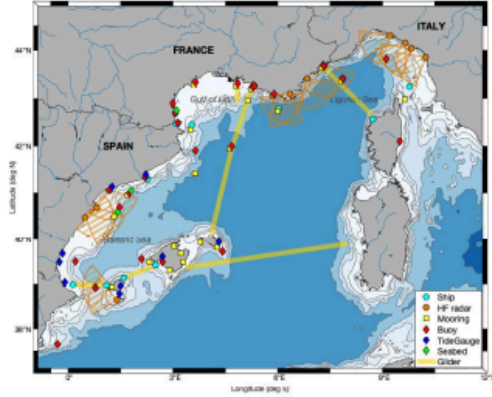
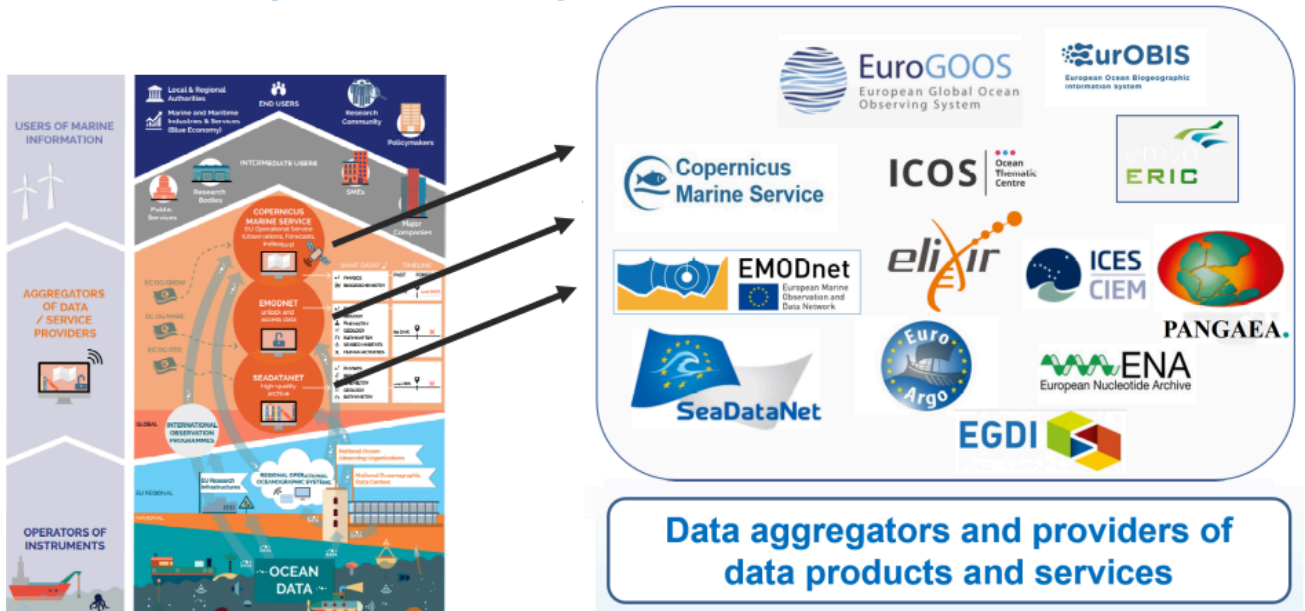


Figure: Overview North-West Mediterranean Pilot Supersite

=> See also overview picture on next slide - from Blue-Cloud

## European landscape of marine data management



## Relation to the JERICO Data Management Plan

[Click to add Title](#)

Main approach in the DMP:

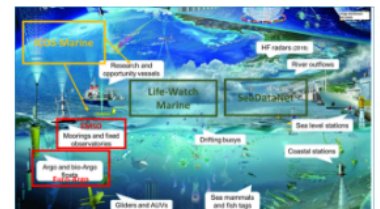
- **Data in scope**
  - Observation data from coastal platforms
  - Data products generated in the projects
- **Data flows should follow as much as possible existing streams**
  - NRT data: ROOS/Instac/EMODnet
  - Validated/historic datasets: Seadatanet/EuroBIS/EMODnet/Blue-Cloud
- This will implicitly lead to **FAIRness of data:**
  - Findable and accessible via the aggregators, as open as possible
  - **Specific action to consider in the data centers:**
    - Compile and add as much metadata as possible from the source
      - Reference to sensor information
      - Unique identifiers
      - Use of vocabularies
      - Include references to e.g. QC software used, documentation, platform (Jerico-CORE assets!)

### 4. Example of optimising FAIRness in SeaDataNet CDI (from ENVRIFAIR)

[Click to add Title](#)

Examples of actions for CDI service FAIRness:

- **(Meta)Dataseservices (EDMERP, EDMO, EDIOS, CSR)**
  - Improved SPARQL endpoints with in RDF relations to all other directories and vocabs.
  - All available now on <https://edmo.seadatanet.org/sparql> , <https://edmed.seadatanet.org/sparql> , <https://edmerp.seadatanet.org/sparql>
  - RDF's all DCAT-AP compliant
  - HTML contains schema.org.
- **CDI SPARQL endpoint**
  - <https://cdi.seadatanet.org/sparql> for aggregated collections metadata and one-to-one CDI mapped RDF
  - Next step will be to facilitate M2M direct data access (for CCBY data) via API to the data behind the aggregation
  - RDF's are all DCAT-AP compliant
  - HTML schema.org compliant
- **CDI API for machine-to-machine access for ordering the data**
- **Other actions related to upgraded metadata schema and tools for data quality related metadata**
  - Added L22 Device type (next to L05 device category)
  - Added link to sensor description
  - Added link to ERDDAP for direct access to dataset (in original format)



### 5. Evaluating FAIRness of data in the PSS/IRS

[Click to add Title](#)

Method for FAIRness evaluation:

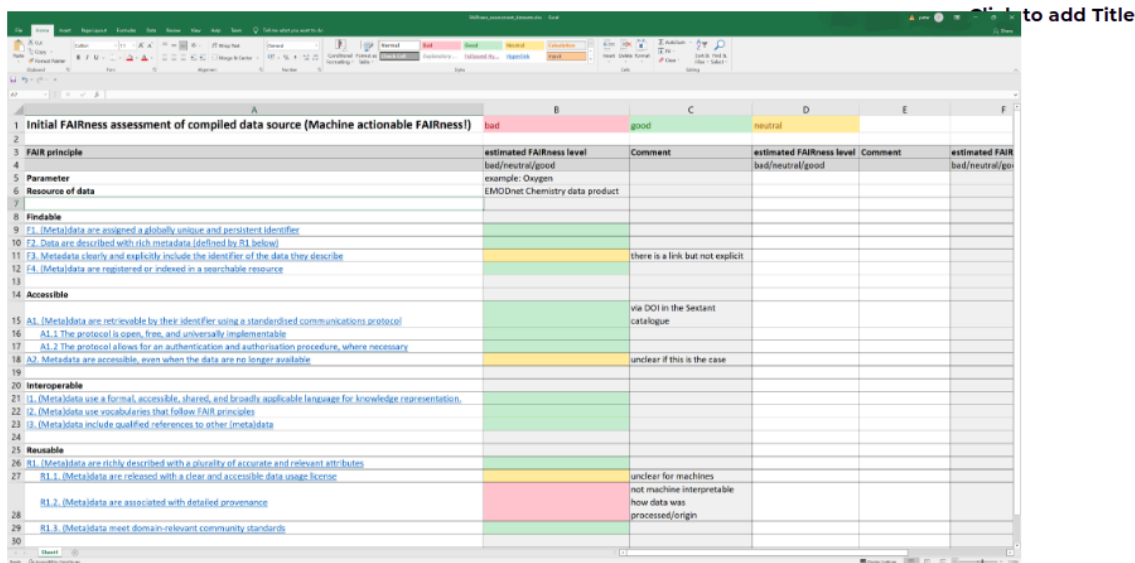
- Use the FAIR metrics
- Evaluate the resources used:
  - Good
  - Neutral
  - Needs improvement :)
- Capture this in a spreadsheet.
- This will deliver a first insight in FAIRness of data in the IRS/PSS, especially if some of the good practices and points for improvement will be shared

This content will be used in a JERICO deliverable D6.7 "FAIRness evaluation report of PSS and IRS" related to data management policy", due October 2022 (delayed).





### 5. Evaluating FAIRness of data in the PSS/IRS



Initial FAIRness assessment of compiled data source (Machine actionable FAIRness!)	estimated FAIRness level	Comment	estimated FAIRness level	Comment	estimated FAIRness level
Parameter	bad/neutral/good	example: Oxygen	bad/neutral/good		bad/neutral/good
Resource of data		EMODnet Chemistry data product			
F1. (Metadata are assigned a globally unique and persistent Identifier)					
F2. (Data are described with rich metadata (defined by R1 below))					
F3. (Metadata clearly and explicitly include the Identifier of the data they describe)		there is a link but not explicit			
F4. (Metadata are registered or indexed in a searchable resource)					
A1. (Metadata are retrievable by their Identifier using a standardised communications protocol)		via DOI in the Sestant catalogue			
A2. (Metadata are accessible, even when the data are no longer available)		unclear if this is the case			
I1. (Metadata use a formal, accessible, shared, and broadly applicable language for knowledge representation)					
I2. (Metadata use vocabularies that follow FAIR principles)					
I3. (Metadata include qualified references to other (meta)data)					
R1.1. (Metadata are richly described with a plurality of accurate and relevant attributes)		unclear for machines			
R1.2. (Metadata are associated with detailed provenance)		not machine interpretable			
R1.3. (Metadata meet domain-relevant community standards)		how data was processed/origin			

## 4.A - Conclusions

### WP1 - Elaborating on interactions between PSSs and IRSs (WP1 Antoine G., Anna R.)

#### Summary

Initiating a joint work for updating the list of Research Axes and elaborating on interactions between PSSs and IRSs based on the JERICO-RI list of Specific Scientific Challenges, Presentation and first use of a pre-elaborated questionnaire.

Aim: To facilitate production of showcase materials that demonstrate JERICO is an RI with transnational/regional/disciplinary integration and a holistic approach to coastal observations. Such demonstration are feeding to the next ESFRI proposal and provide links to the JERICO success stories.

The session started 3 IRS/PSS interaction working groups that were asked to develop their showcase material in the next 6 months towards a final workshop:

Breakout group 1: Fastlane for harmonising observations (or at least not applying the brake)  
Moderator Anouk Blauw, Rapporteur Helene Frigstad

Breakout group 2: Towards JERICO-RI regional and transregional biodiversity observations  
Moderator Klas-Ove Möller, Rapporteur Daniela Maric Pfannkuchen

Breakout group 3: Interactions with user groups and other RIs  
Moderator Dominique Durand, Rapporteur Lauri Laakso

#### Key actions for the (near) future

Getting responses from PSS and IRS leads + colleagues. Questionnaire to be completed by the end of July (!?)



Response analysis and Follow-on meeting in Autumn 2022  
Contribution(s) to D1.4 (and ultimately to the next JERICO ESFRI application)

### **Data Fairness in IRS and PSS (input from WP6)**

#### **Summary:**

Relevance: Growing requirement for FAIR (observation) data from machine2machine processing services in e.g. EOSC, Blue-Cloud, Digital Twins and Virtual Research Environments.

Explained: Background of FAIR, FAIR principles, how to evaluate FAIRness, and what we "JERICO-RI community" could do to improve FAIRness of data (examples: including sufficient metadata, sensor information (SWE), develop M2M data access services)

Action: Evaluation of FAIRness of data, and indication of gaps, in the IRS/PSS

Shown example of collecting data for dataproduct in PSS North Sea and Channel

Approach how to collect information for such evaluation

#### **Key actions for the near future :**

MARIS will contact the IRS/PSS contacts for the FAIRness evaluations, during summer.

Some PSSes have similar data products, this info will be collected.

For IRSes the focus will be on evaluation of the data platforms indicated in D3.1 and 3.2 and how FAIR this data is.

MARIS will compile all information, together with recommendations, into a draft deliverable in September 2022

D6.7 released after review in October 2022

## **5.A - Annexes and references**