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Key Acronyms

WP:	Work Package
VIs:	Virtual Infrastructures
VIPs:	Virtual Infrastructure Providers
VA:	Virtual Access
AI:	Availability Indicator
VI:	Visibility (related to availability indicator)
AC:	Accessibility (related to availability indicator)
PE:	Performance (related to availability indicator)
UEP:	User Engagement Panel
NorFerry:	Ferrybox installations operating in the °Southern Baltic, North Atlantic and Arctic waters from 54 ° to 78 ° North
CEFAS-DATA-HUB:	Marine environmental monitoring data in UK Coastal Waters and North Atlantic seas
Alg@line:	Real time algal monitoring in the Baltic Sea
ÜTO:	Utö Atmospheric and Marine Research Station
SHARK:	Swedish Marine environmental monitoring data
LiSO-HFR:	Ligurian Sea Radar System
POSEIDON:	Monitoring, Forecasting and Information System for the Greek Seas
EOL:	Environment Observable Littoral
NOMOS:	Bulgarian National Operational Marine Observing System
SOCIB:	Balearic Islands Coastal Observing and Forecasting System
BHFR:	Radar system of the Basque Operational Observing Network
SPI-S:	Sediment Profile Imagery Software
MONICAN:	The Nazare Canyon Observatory
Coastal Coriolis:	French Coastal Ocean Observing System

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1. Executive Summary

The primary objective of WP6 is to provide free of charge “virtual access” to data and information from in situ systems such as HF radar, FerryBox and fixed platforms but also other information from discrete samplings or archives. The data and information access will enable scientists to carry out high quality research using data from a variety of coastal observation systems. A secondary objective of the Virtual Access is to promote existing services and potentially the development of new services and to identify the sector of activity already using the data from the coastal observatory network. The first assessment highlighted that all the Virtual Infrastructures give access to an active link where you can retrieve the data of their coastal observatories. However, the information related to the identification of the user is low and only a very limited number of VIPs can identify the sector of activity interested in their data. The User Engagement Panel also considered that 64% of the VIPs had undertaken actions in agreement with the objectives of the WP6. This percentage should increase in the second period of the project.

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2. Introduction

Data holders and institutions need to consider improving the accessibility of well documented data sources, products and services in close collaboration with research and observation communities. The work package (WP6) in collaboration with the Virtual Infrastructure providers aims to report on the value of the VA, the evidence of the existing client community and their continuing needs for the scientific services offered by the VAIs. The VA activity promotes free access of data, products and services to a wide community inside or outside of the project consortium. JERICO-NEXT supports 15 Virtual infrastructures which are committed to make visible and available data, products and services through the website of their coastal observatories and JERICO-NEXT. To monitor the activity of the Virtual Access, two steps process has been set up and has been applied at month 18 of the project. It will be repeated at month 44. The two-step process includes:

1. a template to be filled by the VIPs to report general information about their data portal, the flow of information including the number of visits, the number (or the quantity) of data downloaded, the country of origin and sector of activity (Science, Policy, Industry and Society) of the visitors and the number of scientific outputs (publications, conferences…). D8.13 is a summary of the information provided by the VIPs
2. an assessment from the User Engagement Panel answering to a questionnaire (9 questions) related to the objectives of the VA in JERICO-NEXT and providing advices to the VIPs.

The results of the assessment are reported in D8.13. They highlight potential issues which need to be solved in the next period of the project and advise further developments to improve the findability, accessibility, interoperability and reuse of digital asset (FAIR Guiding Principles) which are either delivered to European data infrastructures such as EMODnet or available on the organisation data portal, displayed in real time or in archives.

3. Summary of the deliverable D8.13

The deliverable 8.13 has focused on accessing the availability of the data and products from the virtual infrastructures according to indicators based on their visibility, their accessibility and performance (how fast the process is to take possession of them). These availability indicators have been applied to provide an understanding of the readiness and service performance of the infrastructure providing access to data. The following table summarizes the defined indicators. Other indicators have been added to label the actions of the VIPs mentioned in the assessment template.

Availability indicators	
AI.VI.1	VI and VI data Visibility
AI.VI.2	Term of use and citation
AI.AC.1	Data Access
AI.AC.2	Data Format
AI.AC.3	Interoperability Services (EMODnet, SeaDataNet, ROOS, CMEMS…),
AI.PE.1	Ability to access and download data in time frame
Additional indicators	
AI.VI.3	advertising the data/products

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AI.PE.2	quality control data process (improvement/visibility)
AI.PE.3	addition of new data sets/products
AI.PE.4	Monitoring the VI activity by statistical tool

Table *X*: Summary of the availability indicators to assess the Virtual Infrastructures

The assessment has been also made on the number of visits to the virtual infrastructures directly or by the search engine or by social media, how long, the number of download and the country of origin of the request. When it is available, the sector of activity has been mentioned in a template. However, because the data are freely available, only 4 virtual access providers have in place a questionnaire to fill (on a voluntary base) before accessing the data to collect this information. Finally, publications, reports and meetings with stakeholders (scientific community, private sector, local and national committee) were reported.
After 18 months in the project, an increase of the visibility of the JERICO-NEXT Virtual Infrastructures has been shown as well as an increase of the number of VIs platforms and datasets available and accessible by means of integrators (e.g. CMEMS and EMODnet-Physics). In conclusion, some actions have been highlighted as a priority:

- Promote the traceability of the data by having DOI for data from each VIP
- Increase the link between the VIs and Pan-European Data Infrastructures
- Increase performance indicators from the primary link of the VIs (ex: increase the visibility of the quality control process)
- Better visibility and accessibility for the biological data

4. Periodic assessment by the User Engagement panel

Six members of the UEP have been engaged in the assessment process of the VI in JERICO-NEXT. They have been selected according to 1) their experience using data and services offered by virtual access providers, 2) their knowledge on ecosystem functioning of the area, and 3) their investment in previous events (general assembly, workshop) in JERICO-NEXT. To make the assessment, the 5 members of the user engagement panel had access to a summary table with all the information on the 15 virtual infrastructures, the deliverable D8.13, and the list of actions already performed and planed by the virtual access providers. Each of them assessed 2 to 3 of the virtual infrastructures:

1. Dr. Laurent Coppola (CNRS-LOV, France)
2. Dr. Bill Turrel (Marine Scotland, United Kingdom)
3. Mr. Johan Vercruysse (Vlaame Overheid MDK, a Kust, Belgium)
4. Dr. David Mills (Bangor University, United Kingdom)
5. Dr. Rodney M. Forster (IECS, University of Hull, United Kingdom)
6. Paul Gaughan (Marine Institute, Ireland)

The assessment was summarised in 9 questions based on the template (D8.12):

1. are the links provided by the VIP in JERICO-NEXT VA active?
2. are the links provided by the VIP provider in JERICO-NEXT VA give you access to the data?
3. is the VIP capable to measure the flow of information on its portal?
4. does the VIP show evidence of information flow from their portal or other European portals?
5. does the VIP show evidence of use of data and/or products?
    a. science
    b. policy

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c. private sector
d. society

6. does the VIP deliver data or products to a European data platform?
7. does the VIP deliver service (European data platform not included)?
8. do you consider the actions done by the VIP during the first 18 months relevant to the WP6 in JERICO-NEXT?
9. do you consider the actions proposed by the VIP for the next 18 months relevant to the WP6 in JERICO-NEXT?

It has been asked to the assessors to answer by YES or NO or NO EVIDENCE for questions 1, 3, 4, 5, 6, 7, 8, 9. For the question 2, the assessors should reply by easy or relatively easy or not easy. The results were summarised in the coloured coded table X below.

	CNRS	SOCIB	Cefas	IH	HCMR	AZTI	HZG	SMHI	FMI	CNR-ISMAR	IFREMER	CNRS-EOL	IO-BAS	SYKE
	SPIArcBase	SOCIB	Cefas Data HUB	MONICAN	POSEIDON	BHFR	COSYNA	SHARK	UTO	LISO-HFR	Coastal Coriolis	EOL	NOMOS	Algaline
1														
2														
3														
4														
5a														
5b														
5c														
5d														
6														
7														
8														
9														

Table 1: Summary of the results of the assessment. The answers were coded: Green for yes and easy, red for no and not easy and orange for no evidence and relatively easy.

Additional comments have been made by the accessors and answered by the providers. They are listed below:

1. SPIArcBase:

remarks: problems when attempting to register as a user on May 3rd, 2018 - email bounced back to me. Delivery has failed to these recipients or groups: si@mail.epoc.u-bordeaux1.fr. A problem occurred and this message couldn't be delivered.
recommendations: Check the functionality of the email address. If the problem continues, please contact your helpdesk.

answer from the provider: as been check and solved

2. SOCIB:

remarks: The Web page is a bit cluttered with so many different types of data platforms
recommendations: the path to access the live data needs to many clicks. it needs simplification

answer from the provider: a new website should be soon available

3. Cefas Data Hub:

remarks: Very impressive interface, obviously not created just for JERICO-NEXT, or using JERICO-NEXT funding. For some reason, the downloaded data appears every time in the junk mail folder
recommendations: Check with the provider, if one of the words in the answer email could trigger the spam filter.

answer from the provider: problem solved concerning the mailbox. Cefas is also developing new products (partially funded by JERICO-NEXT) on non-native and invasive species distribution around UK with the

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collaboration of the private industry (Aggregates UK) and PHYTO-OPS, combining several information on phytoplankton diversity using HPLC analysis, FerryBox results and flow cytometry data for MSFD purposes.

4. MONICAN:

remarks: Some errors on the page - *http://monican.hidrografico.pt/en/default/monican.php* when clicking on the map an "Invalid Token" error appears meaning that data could not be accessed - May 3rd 2018
recommendations: Simple Clear instructions on how to access the data would be helpful in English version

5. HCMR:

remarks: Poseidon OS has a long history on data acquisition, delivery and services and involved in EU projects and infrastructures for a while. provide VA access and products beneficial for JERICO-RI or others RI. However, for some buoys the data transmission does not seem to work.
recommendations: The user registration to access to the data portal is little bit too long and it should be improved. Data DOI should be also one of the top 5 priorities for POSEIDON in order to facilitate the collection of scientific and public data dissemination which is one of the comments of the data provider.

6. AZTI:

remarks: Keep up the good work. Promote and adopt good practices. Continue to integrate your system with other local and European and international networks to create further added value.
recommendations: none

7. HZG:

remarks: I used the German language version of the website for my assessment. I clicked on 'Produkte' and could see descriptions of products. I clicked on 'Daten' to get to the data portal. This is the same as the link provided by JERICO-NEXT (http://codm.hzg.de/codm/). It needs a password for registration. I managed to download some salinity data. Same website for many years.
recommendations: none

8. SMHI:

remarks: I could not switch the data interface into English, hence struggled to use the interface on line. But Only Partly - Statistics provided for this review are partial (i.e. only numbers of page views, with little or no further details)
recommendations: Make sure English is an option on the interface listed for this project (or state that it is only in Swedish). Currently, it is not possible to make further recommendations as for me, as an English speaker, the interface was unusable.

9. FMI:

remarks: as the FMI website is relatively new, it is difficult to assess it because a lot of information are missing
recommendations: Need to wait a year to get a proper assessment.

10. LISO-HFR:

remarks: Impressive capability with effective visualisations and data access via THREDDS server. Evidence of uptake by end-users is not clear although it may be happening but remain invisible.
recommendations: The steps identified for the next 18 months should increase the value, use ability and visibility of the service and increase the service uptake. For example, I assume a successful evaluation by CMEMS would lead to service uptake by Copernicus. The list of recommendations is relatively large, and it may be worth prioritising activities to manage the risk of over commitment.

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11. Coastal Coriolis:

remarks: Easy selection of the data on a map of France. For most locations I selected, I can't see the data on the screen after selection of the data. Relatively easy to download data: it is long way to download data: select on a map the requested data, link to the data is sent by mail, download the data after click on the link, unzip the data. On 14/05/2018, the site hangs after selection of the location Dunkerque, the only possible solution was a complete reset of the site. not easy to view recent data on the screen.
recommendations: none

answer from the provider: if a date range in the past is selected, when no data is available for a given platform, the platform location disappears (which is correct, no data, no platform). The data sub setting is performed off-line; when data files are requested, the user may provide his email address to receive a notification when the file is ready. He may also decide not to provide his email address and simply copy the ftp URL of the result file and check when it is available. We do not plan to change this mechanism: an interactive big data file sub setting would fail on http timeout. The problem reported on a selection of Dunkerque SRN Point 4 (Suivi Régional des Nutriments) could not be reproduced.

12. CNRS-EOL:

remark: The website presented graphs with near real-time data from CTD casts and a surface buoy. To get the data, one would have to navigate to another site and search again.
recommendations: must go to SOMLIT website

13. NOMOS:

remark: The website is old, and it is very difficult to access easily to the dataset. Some data are missing or too old.
recommendations: An update is necessary. Data access and data portal update should be mandatory for JERICO VA. Secondly, data flow information should help to collect information on data users. Finally, DOI attribution and Q/C procedures should improve the information on data quality and data dissemination which are also very useful for JERICO-RI

answer from the provider: Dr. Asen Stefanov who is responsible for website and data management of the IO-BAS data sets has been informed

14. Algaline:

remark: It was not possible to discover any data on either the https://www.finmari-infrastructure.fi/ferrybox/ website or the main Algaline page. The material is old, in some places back to 2013. "FerryBox data is available through EMODnet chemistry and Copernicus Marine Environment Monitoring Service.
recommendations: make available the data from the website and update the information on the website.

answer from the provider: After discussion with Jukka Seppala, it has bee decided that he will talk to the website manager to make available the data and update the information.

15. NorFerry:

Not in the first assessment due to no link available to assess to data. the link should be soon available.

answer from the provider: the link is now available and will be included in the final assessment.

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5. Discussion and Conclusion

The role of the UEP in the assessment of the VA activity is to determine if the objectives of the WP6 have been fulfilled. They have answered to a questionnaire relative to the accessibility and interoperability of the data, to the identification of the users, to the flow of information. They also provided advices to the VIPs for future action for improving and promoting their data, products and services through JERICO-NEXT infrastructure. Having considered the outputs of the D8.13, and a summary of information from each provider, the results of the assessment divided clearly the virtual access infrastructures in two groups: group A: CNRS-Spi-Arcbase, SOCIB, Cefas data Hub, MONICAN, POSEIDON, BHR, COSYNA, Group B: SHARK, UTO, LISO-HFR, Coastal Coriolis, EOL, NOMOS, Algaline. The Group A shows a higher level of compliance to the expectations for the VA, in contrast to the Group B. Most of the VIPs fulfil the requirement concerning the questions relative to the link provided to JERICO-NEXT by the VIP being active, the accessibility of the data, and the use of a statistical tool to measure of information flow between the data portal and the users. Only 4 of the VIs could give numerical information on the sectors of activity interested by their coastal marine data, but 50% of the providers could give other types of information. The UEP also considered that only 9 on 14 VIPs have made actions towards the objectives of the WP6 during the first 18 months but 12 will make the right implementation during the next 18 months towards the traceability of the data, the link with the Pan-European Data Infrastructures, the visibility of the quality control process) and the better visibility and accessibility for the biological data.

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