D5.3 Periodical assessment of Data space services

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Deliverable Abstract
The deliverable provides metrics and assessments of the 13 EGI-ACE Data Space services provided under the Virtual Access (VA) mechanism in WP5.

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Contents

Executive summary

This report provides an assessment at M15 of the 15 WP5 Thematic Service installations from 19 providers provided by the EGI-ACE project under the Virtual Access (VA) mechanism (see Figure 1). The Thematic Services of WP5 contribute to EGI-ACE Key Exploitation Result 3 - Research Data Spaces and Processing Tools.

The assessment was made based on the metrics collected by the 15 WP5 services during the three periods of observations covering the following three periods: M01-M05, M06-M10 and M11-M15. The EOSC Compute Platform, delivered by WP3, WP4 and WP6 is playing a fundamental role to deliver infrastructure and platform services for the scalable and open delivery of the 15 Data Space installations shown in Figure 1.

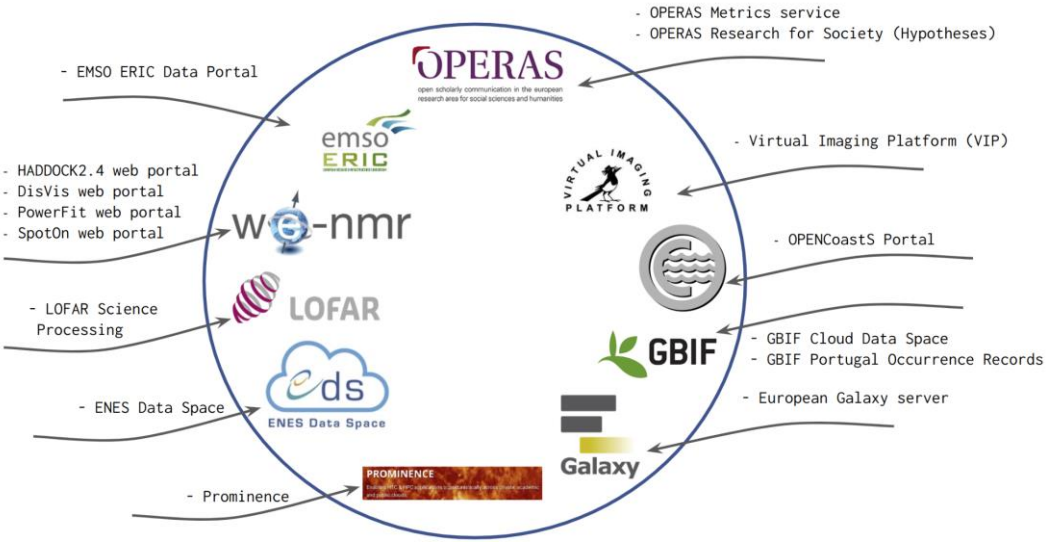

Figure 1 - The WP5 Data Spaces and Thematic services landscape (after 15 months)

The Data Spaces and the Thematic services of WP5 in total served **65,340** users in 15 months, representing **65.98%** increase compared to the 15 months preceding the project start. The EOSC Compute Platform was instrumental to this scale up and delivered **10,553,094** Cloud CPU hours, more than **180** TB storage, **23,393** GPU hours, to the WP5 services. During the first part of the project we also registered more than **42M** of downloads and reached more than **50** countries worldwide.

By looking at the usage across the disciplines, the following can be observed:

- Within the **Health and Medicine** domain: WeNMR, VIP and UseGalaxy.eu served 57,444 users from structural biology, medical imaging and bioinformatics.
- Within the **Climate research** domain: OPENCoastS and ENES served 42 users[1] from the Climate Change scientific domain. The assets offered by the EOSC Compute Platform allows scientists to run forecast simulations with the OPENCoastS service and predict a vast array of coastal dynamics variables. The ENES Data Space delivers a cloud-enabled data science environment for climate data analysis. The first release of the ENES Data Space was rolled out into production in Q3 2021.

[1] Including number of users of the https://operations-portal.egi.eu/vo/view/voname/vo.enes.org VO

- Within the **Energy and Physical Sciences** domain: PROMINENCE and LOFAR Science Products served 43 users from the Fusion and Astronomy domains. The EOSC Compute Platform contributed to open up the processing capabilities of the LOFAR Science Processing Data Space to a wider community of astronomers and develop a service that in the PROMINENCE Data Space will be of use to run significant modelling and use existing experimental data to perform validation.
- Within the **Environmental Sciences** domain: SeaDataNet WebOcean Data Analysis, EMSO-ERIC data services, GBIF Cloud data space and the Disaster Mitigation Agriculture data spaces served 4,642 users from the Environmental scientific domain. The EMO-ERIC Data Space reached pre-production level in 2021 and served 1,977 users/communities.
- Within the **Social Sciences and Humanities** domain: the OPERAS Metrics service and Certification service was on-boarded in EOSC Portal in Q1 2022.

To promote the uptake of new and existing services installations, 30 domain-specific training and dissemination activities were organized during the first part of the project. These activities played an important role to reach a wider user base in Europe as demonstrated by the metrics reported during the three periods of observations. Overall, these domain-specific training and dissemination events were attended by 1,703 participants.

In the second period:

- New releases of the ENES Data Space will be available every 5 months.
- A first release of the SeaDataNet WebOcean Data Analysis Data Space is expected during Q2 of 2022.
- The iCOMCOT science portal from the Disaster Mitigation and Agriculture Data Space is planned to be on-boarded in the EOSC Portal for Q4 of 2022.
- The EMSO ERIC Data Space is moving from the pre-production to the production level in 2022.
- The full integration of the production OPERAS Metrics service and Certification service in the EOSC Compute Platform is expected during Q3 of 2022.

Additional dissemination activities will be organized also during the second part of the project to promote the services uptake. More specifically, the following events have been already planned by the WP5 partners:

- The role of OPENCoastS+ on European Digital Ocean Twins initiative, April 2022.
- Tutorial on the Virtual Imaging Platform - Applications as a Service and Beyond, June 2022.
- OPENCoastS+: an EOSC-powered service for on-demand prediction of coastal water quality, July 2022.
- LOFAR Science Products and PROMINENCE Data Spaces will be presented in dedicated webinars in 2022.

1. Introduction

Virtual Access (VA) is financial instruments to reimburse the access provisioning costs to access providers. This instrument is provided by the European Commission to increase the sharing of research infrastructures and services that otherwise would not be available to international user groups.

In VA, the services – also called “installations” – must be made available ‘free of charge at the point of use’ for European or International researchers. VA access is open and free access to services through communication networks to resources needed for research, without selecting the researchers to whom access is provided.

Virtual Access to services of the EGI-ACE catalogue applies to the following four categories:

1. Infrastructure Services WP3 - the Cloud Compute (IaaS) and High Throughput Compute services of the EGI portfolio supported by a set of 16 datacentres from the EGI Federation. The enabling components that support the Cloud Compute service: AppDB, for resource discovery and software catalogue; Dynamic DNS, for user-managed DNS provision of domain names for VMs and services running on the e-Infrastructure; and Infrastructure Manager (IM) for the basic orchestration of IaaS resources.
2. Platform Services WP4 - mature software tools offering generic capabilities to facilitate the usage of the underlying infrastructure for EOSC users and Data Spaces.
3. Federated data spaces WP5 - services provided by major European research collaborations, research infrastructures and research institutes, and are composed of mature software tools, datasets and services that offer science discipline specific processing and data analysis capabilities for EOSC users.
4. Federated Access Services WP6 – services providing secure access to other services and enabling large-data analysis workloads in the distributed infrastructure. Included services are delivered by major European research institutions using mature open-source software with already established user communities from multiple scientific disciplines.

This document provides Virtual Access metrics and assessment for WP5 - Federated data spaces.

1.1 Installations

Within EGI-ACE project 15 installations are part of Virtual Access Work Package 5.

The status of the integration activities of the WP5 Thematic Services and Data Space installations, and the EOSC Compute Platform services (WP3, 4, 6 and 7) is shown in Appendix I.

The distribution of the EGI-ACE Data Spaces and Thematic Services by scientific disciplines and the number of users served per disciplines are reported in the Figures below:

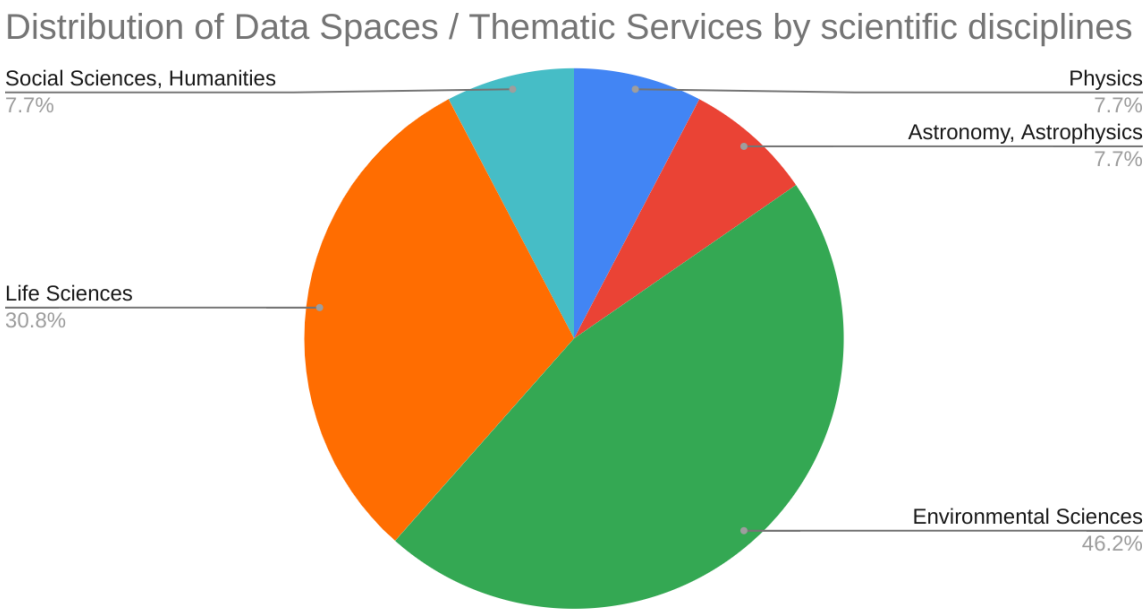

Figure 2 - Distribution of service installations across domains

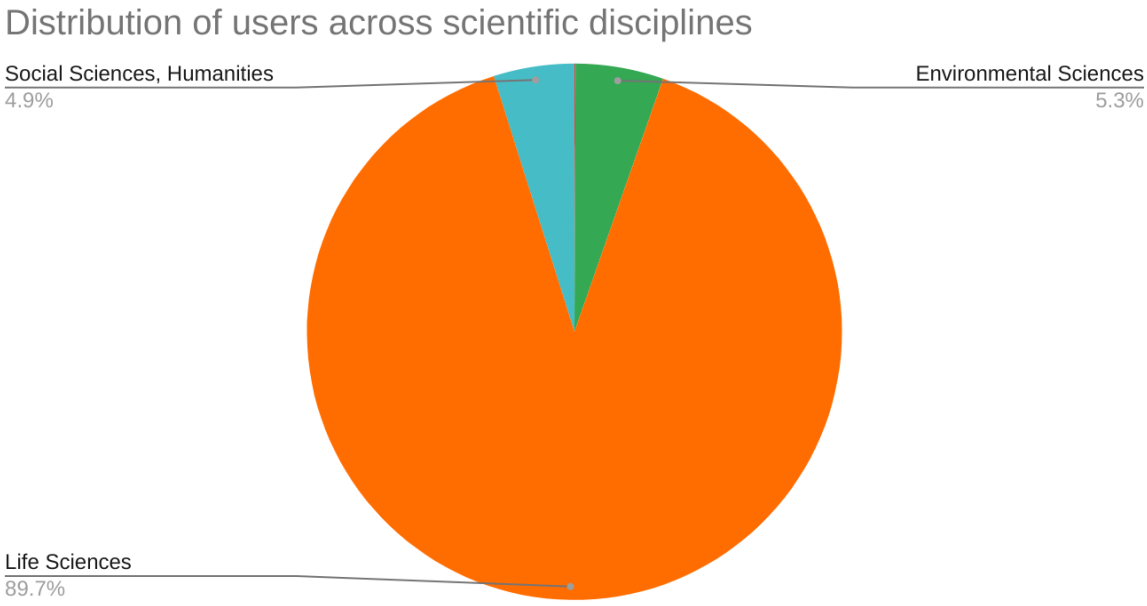

Figure 3 - Distribution of users per scientific disciplines

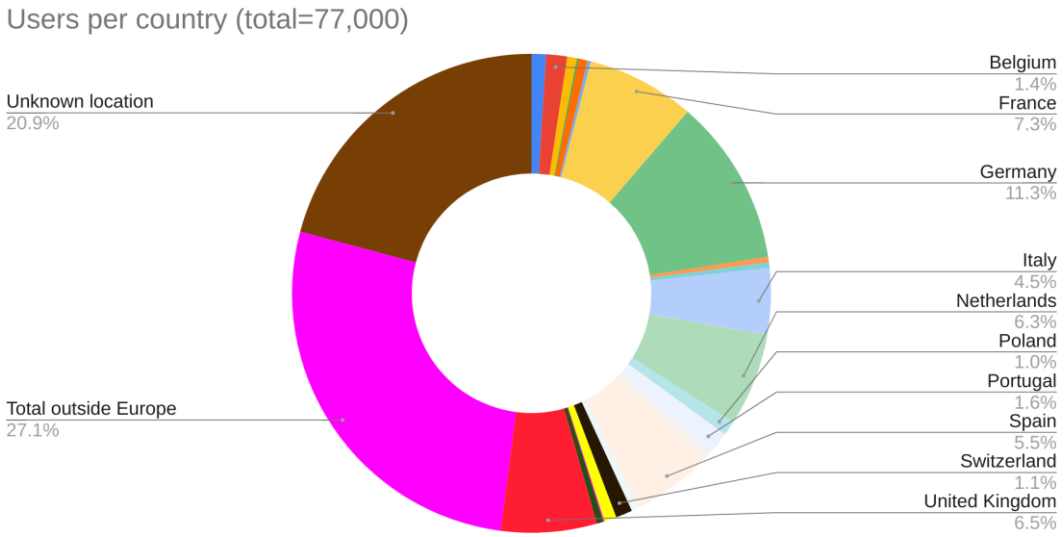

Figure 4 - Users distribution per country

The variation (in %) of the number of users per Data Space and/or Thematic service is summarised in the tables below.

Table 1 - Status of the Health and Medicine Data Spaces (T5.1)

	WeNMR	**VIP**	**useGalaxy.eu**	**OpenRiskNet/ NanoCommons Virtual Environment**
Metric	*No. of new registered users*	*No. of registered users*	*No. of registered users*	*No. of registered users*
15 months before the project	5,625	1,250	25,000	125
During M01-15	8,056	1,388	48,000	0
Variation (%)	**+41.45%**	**+11%**	**+92%**	**N/A**
Explanation	Continuing the operation of the thematic portals. Organized 9 events to promote the services.	Integrated 1 new application. Started to promote the platform. Organized 4 events to promote the service.	Integration with the EOSC Compute Platform is in progress.	Old service was revoked from the EOSC Portal, new service isn't ready yet.

Table 2 - Status of the Climate Data Spaces (T5.2)

	OPENCoastS	**ENES Data Space**
Metric	*No. of registered users*	*No. of active users*
15 months before the project	312	92
During M01-15	16	24[2]
Variation (%)	**-94.87%**	**-97.82%**
Explanation	Limited opportunities for live dissemination and training events due to COVID restrictions. Development activities during the first part of the project. Organized 4 events to promote the service.	Focus on a significantly new release that became available towards the end of 2021. Promotion of the new platform started recently. Organized 2 events to promote the service.

Table 3 - Status of the Energy and Physical Sciences (T5.3)

	PROMINENCE	**LOFAR Science Product**
Metric	*No. of users requesting access*	*No. of users requesting access to LOFAR*
15 months before the project	3.75	0
During M01-15	2	41
Variation (%)	**+46.67%**	**N/A**
Explanation	Increased pledged resources assigned to the Data Space. Started the HPC pilot activities to run the JOREK non-linear MHD code.	First release rolled out into production in 2021 Q3. Organized 3 events to promote the service.

[2] It also includes the users in the https://operations-portal.egi.eu/vo/view/voname/vo.enes.org VO

Table 4 - Status of the Environmental Sciences (T5.4)

	SeaDataNet WebOcean Data Analysis	**EMSO ERIC data services**	**GBIF Cloud Data Space**	**Disaster Mitigation and Agriculture**
Metric	*No. of new registered users*	*No. of new users*	*No. of unique users*	*No. of new registered users*
15 months before the project	125	250	10,038	187
During M01-15	0	1,977	6,858	0
Variation (%)	**N/A**	**+690%**	**-46.36%**	**N/A**
Explanation	Integration of the Data Space with the EOSC Compute Platform is still in progress.	Integrated 1 new application. Started to promote the platform.	Integration in progress	Integration of the Data Space with the EOSC Compute Platform in progress.

Table 5 - Status of the Social Sciences and Humanities (T5.5)

	Operas Metrics service and Certification service
Metric	*No. of registered publishers*
15 months before the project	12
During M01-15	0
Variation (%)	**N/A**
Explanation	Integration of the Data Space with the EOSC Compute Platform in progress.

Following installations have been subject to change since the beginning of the project:

- 1 service has been revoked from WP5 from the EOSC Portal (OpenRiskNet/NanoCommons Virtual Environment). A new service will be on-boarded during the second part of the project.
- The integration plans of the two unfunded Data Spaces, including OpenRiskNet, and the Disaster Mitigation and Agriculture underwent a delay due to the lack of human effort being available during the first part of the project. The first service from the Disaster Mitigation and Agriculture Data Space, iCOMCOT, and the OpenRiskNet service are expected for 2022.

1.2 Metrics definition

For each installation several metrics have been defined between the provider and WP5 leader, taking into account following categories:

- **Number of users** – depending on the nature of installation, number could be defined based on accounts (if registration was required) or number of unique IPs (if registration is not needed to benefit of the service).
- **Usage** – the goal of this metric is to report how much the service is used. This metric depended on functionality provided by the service.
- **Number and names of the countries reached** – the goal of this metric was to report how broadly the service is used and how the geographical coverage is changing with time.
- **Marketplace views** – the goal of this metric is to provide information about how often the service is being viewed by the potential customers.
    - This metric is not applicable to federation services due to the nature of the service. Federation services are enabling federation and are supporting delivery of customer facing services. Thus, cannot be ordered.
- **Marketplace orders** – the goal of this metric is to provide information about how often the service is being ordered via EOSC Marketplace.
    - This metric is not applicable to federation services due to the nature of the service. Federation services are enabling federation and are supporting delivery of customer facing services. Thus, cannot be ordered.

2 Installations

2.1 WeNMR: A worldwide e-Infrastructure for NMR spectroscopy and Structural biology

Description	The WeNMR services consist of a suite of web portals, providing user-friendly access to complex computational workflows and tasks. The WeNMR data analytics platform consists of a collection of user-friendly portals serving a community of over 16'000 users worldwide. The WeNMR services allow inexperienced and experienced structural biologists to use state-of-the-art software for their data analysis while benefiting from the EOSC computational infrastructure. The services make use of high-throughput computing (HTC) resources, but some are also using GPGPU grid resources and cloud computing. The portals are already integrated with the EOSC AAI, present in the EOSC Portal and Marketplace, and use the EGI Check-in and DIRAC4EGI services to send ~10 million jobs per year to HTC resources. WeNMR has been successfully serving the structural biology community for over 10 years now. The community shows a sustained growth with > 3500 new users per year. The WeNMR services are fully operational, all available under the EOSC portal and marketplace.
Task	5.1
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	http://www.wenmr.eu/
Location	Utrecht (NL), Florence (IT)
Duration	M01-M30

Modality of access	Web interfaces
Support offered	The planned activities would encompass user support, training, and continuous operation of the various grid- and cloud-enabled web portals.
Operational since	Some of the services have been operational since June 2008
User definition	A user is a person making use of at least one of our thematic services. All portals except one (FANTEN) do require user registration. For FANTEN, users are identified by their IP address for collecting the various metrics.

2.1.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of user runs submitted	27,500	Internal logs of the service / accounting	41,884	42,783	41,250
No of grid/cloud jobs submitted	1,440,000	Internal logs of the service / accounting	1,193,844	1,360,972	1,075,979
HS06 CPU Time/Wall Time hours consumed by job submitted to grid/cloud resources	17,500,000 grid / 75,000 cloud	Internal logs of the service / accounting	18,168,871 (grid) / 103,233 (cloud)	24,907,699 (grid) / 52,613 (cloud)	25,938,182 (HS06 CPU Time hours (grid+cloud))
No of countries reach	110	Internal logs of the service / accounting	128	135	138
Names of countries reach	Worldwide	Internal logs of the service / accounting	Afghanistan Albania Algeria	Afghanistan Albania Algeria	Åland Islands Afghanistan Albania

			Argentina Armenia Australia Austria Azerbaijan Bahrain Bangladesh Belarus Belgium Belize Bolivia Bosnia and Herzegovina Brazil Brunei Bulgaria Cameroon Canada Chad Chile China Colombia Comoros Costa Rica Croatia	American Samoa Argentina Armenia Australia Austria Azerbaijan Bahrain Bangladesh Belarus Belgium Belize Bolivia Bosnia and Herzegovina Brazil Brunei Bulgaria Cameroon Canada Chad Chile China Colombia Comoros	Algeria American Samoa Argentina Armenia Australia Austria Azerbaijan Bahrain Bangladesh Belarus Belgium Belize Bolivia Bosnia and Herzegovina Brazil Brunei Bulgaria Cameroon Canada Chad Chile China Colombia Comoros

			Cuba	Costa Rica	Costa Rica
			Cyprus	Croatia	Croatia
			Czech Republic	Cuba	Cuba
			Czechia	Cyprus	Cyprus
			Côte d'Ivoire	Czech Republic	Czech Republic
			Denmark	Côte d'Ivoire	Cote d'Ivoire
			Dominican Republic	Denmark	Denmark
			Ecuador	Dominican Republic	Dominican Republic
			Egypt	Ecuador	Ecuador
			El Salvador	Egypt	Egypt
			Estonia	El Salvador	El Salvador
			Ethiopia	Estonia	Estonia
			Finland	Ethiopia	Ethiopia
			France	Finland	Finland
			Georgia	France	France
			Germany	Gambia	Gambia
			Ghana	Georgia	Georgia
			Greece	Germany	Germany
			Greenland	Ghana	Ghana
			Guatemala	Greece	Greece
			Hong Kong	Greenland	Greenland
			Hungary	Guatemala	Guatemala
			Iceland	Haiti	Haiti
			India	Hong Kong	Hong Kong

			Indonesia	Hungary	Hungary
			Iran	Iceland	Iceland
			Iraq	India	India
			Ireland	Indonesia	Indonesia
			Israel	Iran	Iran
			Italy	Iraq	Iraq
			Japan	Ireland	Ireland
			Jordan	Israel	Israel
			Kazakhstan	Italy	Italy
			Kenya	Japan	Japan
			Kuwait	Jordan	Jordan
			Latvia	Kazakhstan	Kazakhstan
			Lebanon	Kenya	Kenya
			Lithuania	Kuwait	Kuwait
			Luxembourg	Laos	Laos
			Macao	Latvia	Latvia
			Macedonia	Lebanon	Lebanon
			Malawi	Lithuania	Lithuania
			Malaysia	Luxembourg	Luxembourg
			Maldives	Macao	Macao
			Malta	Macedonia	Macedonia
			Mexico	Malawi	Malawi
			Morocco	Malaysia	Malaysia
			Nepal	Maldives	Maldives

			Netherlands	Mali	Mali
			New Zealand	Malta	Malta
			Nigeria	Mexico	Mexico
			Niue	Mongolia	Moldova
			Norway	Morocco	Mongolia
			Oman	Myanmar	Morocco
			Pakistan	Namibia	Myanmar
			Palestine	Nepal	Namibia
			Panama	Netherlands	Nepal
			Papua New Guinea	New Zealand	Netherlands
			Paraguay	Nigeria	New Zealand
			Peru	Niue	Nigeria
			Philippines	Norway	Niue
			Poland	Oman	Norway
			Portugal	Pakistan	Oman
			Puerto Rico	Palestine	Pakistan
			Qatar	Panama	Palestine
			Romania	Papua New Guinea	Panama
			Russia	Paraguay	Papua New Guinea
			Rwanda	Peru	Paraguay
			Réunion	Philippines	Peru
			Saint Lucia	Poland	Philippines
			Saudi Arabia	Portugal	Poland
			Senegal	Puerto Rico	Portugal

			Serbia	Qatar	Puerto Rico
			Singapore	Romania	Qatar
			Slovakia	Russia	Romania
			Slovenia	Rwanda	Russia
			South Africa	Réunion	Rwanda
			South Korea	Saint Lucia	Reunion
			Spain	Saudi Arabia	Saint Lucia
			Sri Lanka	Senegal	Saudi Arabia
			Sudan	Serbia	Senegal
			Sweden	Singapore	Serbia
			Switzerland	Slovakia	Singapore
			Taiwan	Slovenia	Slovakia
			Thailand	South Africa	Slovenia
			Timor-Leste	South Korea	South Africa
			Togo	Spain	South Korea
			Tunisia	Sri Lanka	Spain
			Turkey	Sudan	Sri Lanka
			Tuvalu	Sweden	Sudan
			Uganda	Switzerland	Sweden
			Ukraine	Taiwan	Switzerland
			United Arab Emirates	Thailand	Taiwan
			United Kingdom	Timor-Leste	Thailand
			United States	Togo	Timor-Leste
			Uruguay	Tunisia	Togo

			Uzbekistan Venezuela Virgin Islands Vietnam Zimbabwe	Turkey Tuvalu Uganda Ukraine United Arab Emirates United Kingdom United States Uruguay Uzbekistan Venezuela Virgin Islands Vietnam Zimbabwe	Tunisia Turkey Tuvalu Uganda Ukraine United Arab Emirates United Kingdom United States Ukraine Uruguay Uzbekistan Venezuela Virgin Islands Vietnam Zimbabwe
No of new registered users	4,500	Internal logs of the service / accounting	2,660	2,720	2,676

2.1.2 Assessment

The WeNMR Thematic Services, supported by the UU[3] and CIRMMP, have been fully operational for many years by now with demonstrated impact and usage. All the thematic services are available in the EOSC Portal and Marketplace[4] (under the Software category). Access to the computing and storage resources to support the operation of the Thematic Services was formalized with EGI through a Service Level Agreement (SLA)[5] which has been extended until June 2023. A total of 50+ Million (HTC) CPU/h (opportunistic access), 500+ cloud CPU cores and 60TB of storage are provisioned to allow the structural biologist community to have a transparent access to computing facilities. This capacity allocation is officially supported by SARA-Matrix and NIKHEF (NL), TW-NCHC (TW), NCG-INGRID-LP (PT), INFN-PADOVA-STACK and INFN-LNL-2 (IT), CESNET-MCC (CZ), IFCA-LCG2 and CESGA (ES) and UA-BITP (UA).

The integration with the EOSC Compute Platform, and the use of resources, are instrumental for continuing to offer free access to the WeNMR Thematic Services via web portals. The benefits that EGI-ACE is bringing to the WeNMR Thematic services are clearer whether we consider the % of increment of the VA metrics reported at the beginning of the project and after 12 months. More specifically:

- No. of user runs submitted (before the project start): 34,375[6]
- No. of user runs submitted at M15: 41,250, with an increment of +20%
- No. of new registered users (before the project start): 5,695[3]
- No. of new registered users at M15: 2,660+2,720+2,676=8,056, with an increment of +41.45%

Several outreach and training events were organized by the University of Utrecht (UU) and the Consorzio Interuniversitario Risonanze Magnetiche di Metallo Proteine (CIRMMP)[7] to promote the uptake of the services suite across the structural biologists community. A total of 12 training events were organized during the first part of the project. As shown by the metrics collected during the three periods of observation (see table above), outreach and training activities actively contributed to promote the uptake of the WeNMR Thematic Services to reach a wider user base in Europe and worldwide. Most of the metrics have already met the target baseline. We expect to further improve this positive trend also during the second part of the project.

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[3] https://www.uu.nl/en
[4] https://marketplace.eosc-portal.eu/services/c/software?scientific_domains%5B%5D=23
[5] https://documents.egi.eu/document/2751
[6] Normalized metric (considering the last 15 months)
[7] https://www.cerm.unifi.it/about-us/cirmmp

As part of the dissemination activities, a dedicated case study[8] was also published in the EGI web site. From a technical point of view, during the second part of the project, special assistance will be devoted to move from X.509 certificates to token-based authentication and support the integration with the EGI Workload Manager[9] service. During the second part of the project the Data Space will also investigate the possibility of integrating the HPC resources in the WeNMR portal.

2.2 Virtual Imaging Platform (VIP)

Description	VIP (Virtual Imaging Platform) is a web portal for the simulation and processing of massive data in medical imaging. VIP users can access applications as a service and significant amounts of computing resources and storage (provided by the biomed EGI Virtual Organisation) with no required technical skills beyond the use of a web browser. VIP is thus both a : -- Service provider, in the sense that it provides users with applications as a service and various other service for FAIR data analysis through Boutiques (containers, publication to Zenodo, DOIs). -- Consumer of resources, in the sense that applications available in VIP exploit HTC computing, storage and GPU resources provided by the biomed EGI VO. Medical imaging applications have always been compute intensive. In the last few years, in addition to the usual CPU computing needs, GPU usage has become mandatory for the processing of (3D) medical data, as well as for efficient machine learning approaches such as deep learning. The service enables the life sciences medical imaging community to have a transparent access to such computing facilities, especially for collaborators with no specific computer science background. A typical use-case consists in : -- Training phase: researchers build and train deep learning algorithms and models (GPUs needed) -- Testing phase: medical doctors/specialists use these models to test their data (GPU or CPU)
Task	5.1
URL	

[8] https://www.egi.eu/use-cases/research-infrastructures/wenmr-a-worldwide-e-infrastructure-for-nmr-60348-2/
[9] https://www.egi.eu/services/workload-manager/

Service Category	Data Spaces and Analytics
Service Catalogue	https://www.creatis.insa-lyon.fr/vip/
Location	INSA, Lyon, France
Duration	M01-M30
Modality of access	Web interfaces and APIs
Support offered	Helpdesk, technical support will be provided for integration use cases. Training/workshops will be provided
Operational since	2011
User definition	A user from life sciences medical imaging community, more specifically to the medical imaging research community

2.2.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of registered users	1,000	Internal logs of the service / accounting	1,300	1,366	1,388
No of use cases	2	Internal logs of the service / accounting	1	0	1

No of countries reach	75	Internal logs of the service / accounting	81	81	82
Names of countries reach	Worldwide	Internal logs of the service / accounting	Worldwide	Worldwide	Worldwide

2.2.2 Assessment

The main impacts of the EGI-ACE project on the Virtual Image Platform (VIP)[10] Data Space for the first 15 months concern the integration of the EGI Check-in[11] service, the user support with new applications and computing resources (GPUs), as well as a good dissemination campaign that should allow for the discovery and adoption of the VIP open services by new users. From a technical point of view, the integration of the Virtual Image Platform[12] with EGI AAI Check-in has been completed and is now available in production. This integration has also led to a presentation[13] at the ISGC conference in March 2022.

From user point of view, a new scientific application (the BRATS pre-processing pipeline[14]) has been integrated in VIP for the Neuroimaging community. VIP also participated in the MSSEG-2[15] scientific challenge and provided, through EGI ACE, the computing resources necessary (special GPU request) for the execution of the 31 pipelines integrated in VIP for the challenge. This event led to a presentation[16] at the EGI conference in 2021.

Access to the computing and storage resources to support the operation of the Platform has been formalized with EGI through a Service Level Agreement (SLA)[17] which has been extended until June 2023. A total of 440+ Million (HTC) CPU/h (opportunistic access), 350+ cloud CPU cores and 25TB of storage have been provisioned by 14 resources providers to allow the Life Sciences medical imaging community to have a transparent access to computing facilities. This capacity allocation is officially supported by BEIJING-LCG2 (CN),

[10] https://marketplace.eosc-portal.eu/services/virtual-imaging-platform
[11] https://www.egi.eu/services/check-in/
[12] https://vip.creatis.insa-lyon.fr/
[13] https://indico4.twgrid.org/event/20/contributions/1117
[14] https://cbica.github.io/CaPTk/preprocessing_brats.html
[15] https://portal.fli-iam.irisa.fr/msseg-2/
[16] https://indico.egi.eu/event/5464/contributions/15641/attachments/14127/17960/EGI_VIP_MSSEG2_v3.pdf
[17] https://documents.egi.eu/document/2874

CESNET-MCC (CZ), CLOUDIFIN (RO), CREATIS-INRA-LYON, OBSPM, GRIF, IN2P3-CPPM and IN2P3-IRES (FR), INFN-BARI, INFN-CATANIA, INFN-FERRARA, INFN-PISA, and INFN-ROMA3 (IT), NCG-INGRID-PT (PT).

Outreach and dissemination activities have contributed to promote the Data Space and increase the metrics collected during the three periods of observation. A dedicated case study[18] was published in the EGI web site and a webinar[19] was organised in March 2022. For the second part of the project we expect to integrate additional scientific applications in the Platform and continue with the outreach and dissemination activities. The Data Space will also investigate the possibility of integrating the EGI Notebooks service in the platform.

During the last period of observation, the following % of increment was registered for the Data Space:

- No. of registered users (before the start of the project): 1,250[20]
- No. of registered users at M15: 1,388, with an increment of +11%

2.3 OpenRiskNet/NanoCommons Virtual Environment

Description	OpenRiskNet operates a reference infrastructure consisting of 45 services grouped into seven categories: 1) Toxicology, Chemical Properties and Bioassay Databases, 2) Omics Databases, 3) Knowledge Bases and Data Mining, 4) Ontology Services, 5) Processing and Analysis, 6) Predictive Toxicology and 7) Workflows, Visualisation and Reporting. This infrastructure will be ported to the EGI-ACE cloud platform and offered to EOSC users by the project who will be able to test their functionalities and their applicability to their own specific study requirements, then to apply for additional EOSC resources, including but not limited to the EGI-ACE platform to setup and operate private environments to perform the actual risk assessments or safe-by-design studies. The risk assessment infrastructure will be further optimized to better integrate with other services of EGI-ACE, including AAI, HPC, Jupyter for making the provided data sources more visible and interlinkable with data from other relevant communities. OpenRiskNet and NanoCommons provide concepts and guidelines for data management and sharing, specialized databases and software as well as a standardized cloud setup for the core infrastructure, and guidelines for the deployment of data and compute services on top of this core. With the latter, it is possible to set up virtual environments, in which the user can deploy the needed

[18] https://www.egi.eu/use-cases/research-infrastructures/biomed/
[19] https://indico.egi.eu/event/5824/
[20] Normalized metric (considering the last 15 months)

	tools in a harmonized and interoperable way and execute workflows using Jupyter notebooks or visual workflow managers like Squonk developed by one OpenRiskNet partner. The service integration also included the development of workflows to support the case study work by automating complex tasks only achievable by the combination of multiple services. Additional services are being integrated by NanoCommons and external partners to complete the portfolio to allow full risk assessment of chemical compounds and nanomaterials, including tools for image analysis to predict nanomaterials properties or ecotoxicity, a range of QSAR models, tools for prediction of molecular initiating events and adverse outcome pathways and more.
Task	5.1
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	
Location	Johannes Gutenberg Universität Mainz Germany (this will be replaced by an installation at EGI since the support is running out in 2021)
Duration	M01-M30
Modality of access	Web interfaces
Support offered	Technical support for use cases, integration policy. Training, user documentation will be offered.
Operational since	June 2020

User definition	Users for OpenRiskNet/nanoCommons services are typical industry and academic researchers, risk assessors, data managers, software developers

2.3.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of new registered users	100	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
Workload of worker nodes	0	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
No of countries reach	15	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
Names of countries reach	European	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
No of new registered users	100	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
Workload of worker nodes	0	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
No of countries reach	15	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
Names of countries reach	European	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A

2.3.2 Assessment

The OpenRiskNet/NanoCommons Virtual Environment Data Space is unfunded in EGI-ACE. This Data Space is supported by the University of Birmingham and Edelweiss Connect. The ambition of this Data Space was to increase the access and use of data, services and tools based on new approach methods supporting next generation risk and safety assessment, improve data quality and integrity, provide a reliable deployed infrastructure and services, and expose values of services to broader scientific communities.

The original plan was to move the OpenRiskNet risk assessment services in the EOSC Compute Platform. For supporting the porting of the OpenRiskNet risk assessment service, an initial capacity allocation composed of 32 vCPU cores, 64GB of RAM and 1TB of storage was enabled in the EOSC Compute Platform. The capacity allocation is supported by IFCA-LCG2 (ES) with dedicated Operational Level Agreement (OLA)[21]. Unfortunately, due to the lack of resources and budget allocated, the deployment activity was put on hold during the first part of the project.

Members of the Data Space have commenced deployment work in late March 2022, starting with a NanoCommons Transnational Activity aiming to deploy and evaluate several resources by June 2022 and use them in a virtual training. The plan for the next part of the project is also to deploy OpenTox and OpenRiskNet resources over the period April - August 2022, investigate the adoption of the Authentication and Authorization solution offered by EGI-ACE, and support a virtual summer school activity at the end of July 2022.

2.4 useGalaxy.eu

Description	The European Galaxy server (https://usegalaxy.eu) is the biggest Galaxy instance in Europe, and one of the biggest worldwide. This service provides access to underlying HPC and Cloud resources to more than 20.000 researchers. The service will make use of cloud compute, workload management and AAI services from EGI-ACE. The European Galaxy server is part of EOSC-Life, used by EOSC-Nordic and listed in the EOSC marketplace (https://marketplace.eosc-portal.eu/services/european-galaxy-server). In particular, UseGalaxy.eu provides: - compute and storage resource without any charge, - more than 2500 well-documented and constantly maintained tools, - 40.000 automatically built and tested containers, - 7 TB of reference data shared via CMVFS, - 250 GB quota per user (500 GB for ELIXIR members), - free registration, - Training Infrastructure as a Service (TIaaS).
Task	5.1
URL	
Service Category	Data Spaces and Analytics

[21] https://documents.egi.eu/document/3749

Service Catalogue	https://usegalaxy.eu/
Location	Freiburg (Germany)
Duration	M01-M30
Modality of access	Web interfaces and APIs
Support offered	Service is open access upon registration. User documentation is in place. Technical support is provided upon requests
Operational since	2013
User definition	Individual researchers and communities in genomics, proteomics, metabolomics, ecology, climate-science, material-science, machine learning and many more

2.4.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M1-M5	Period 2 M6-M10	Period 3 M11-M15
No of user jobs	200,000	Public monitoring under https://stats.galaxyproject.eu	20,000,000	34,318,670	44,000,000
No of countries reach	60+	Public monitoring under https://stats.galaxyproject.eu	80	90	92

Names of countries reach	Worldwide	Public monitoring under https://stats.galaxyproject.eu	worldwide	worldwide	worldwide
No of registered users	20,000	Public monitoring under https://stats.galaxyproject.eu	32,000	40,000	48,000

2.4.2 Assessment

During the reporting period the useGalaxy.eu Data Space[22] has started the integration with EGI Check-in[23] to allow users to be authenticated using their Identity Providers. In addition, the EGI Datahub[24] service was assessed to allocate computing capacities near data, and the EGI Workload Manager[25] service was taken into consideration to implement a meta-scheduler in order to dispatch jobs both in the Pulsar network and in the resources procured by the EOSC Compute Platform. In terms of metrics, all the target baseline have been already met.

During the last period of observation, the following % of increment were registered for the Data Space:

- No. of registered users (before the start of the project): 25,000[26]
- No. of registered users at M15: 48,000 new users, with an increment of +92%

2.5 OPENCoastS

Description	The OPENCoastS_PLUS EOSC service will provide on-demand water quality hindcast and forecast simulations for the coastal region selected by each user. It builds on OPENCoastS, an on-demand circulation forecast service already integrated in EOSC through the EOSC-hub project. The improved version will include: -- The capacity to forecast water quality variables, namely 3-dimensional fecal contamination indicators or a generic tracer, in addition to the circulation variables from the basic OPENCoastS (water levels and 3D velocity, salinity and temperature)

[22] https://marketplace.eosc-portal.eu/services/european-galaxy-server
[23] https://www.egi.eu/services/check-in/
[24] https://www.egi.eu/services/datahub/
[25] https://www.egi.eu/services/workload-manager/
[26] Normalized metric (considering the last 15 months)

	-- The capacity to simulate hindcasts (the past) and scenarios (associated for instance at climate change impacts on coastal systems) If used in hindcast/scenario mode, simulations do not have to be executed everyday, so requirements on timely delivery of the outputs are alleviated. Like OPENCoastS, the enhanced service uses the efficiently parallelized modeling suite SCHISM. New modules are used, with the associated need to integrate with core eosc-hub services for computing and storage, as OPENCoastS_PLUS is more demanding of resources than the basic service.
Task	5.2
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	https://marketplace.eosc-portal.eu/services/opencoasts-portal
Location	Portugal
Duration	M01-M30
Modality of access	Web interfaces
Support offered	Several training activities are planned
Operational since	June 2018

User definition	Users can be individual researchers or organisations. They can set up deployments for their individual use or for shared purposes (some users will set up deployments while others may just access them).

2.5.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of registered users	250	Internal logs of the service	40	10	16
No of international deployments	170	Internal logs of the service	6	3	21
No of requested extensions	10	Internal logs of the service	0	7	2
No of use cases	100	Internal logs of the service	38	9	21
No of countries reach	20	Internal logs of the service	26	5	7
Names of countries reach	Portugal	Internal logs of the service	Australia, Croatia, Netherlands, Taiwan, France, India, Suécia, Brasil, Lithuania, China, USA, Turkey, Jersey, Jamaica, Spain, Iran, Romania, Germany, Martinique, New Zealand, Vietnam, Italy, Indonesia, Ukraine, Senegal, Saudi Arabia, South Korea	Brasil, Portugal, Indonesia, Germany, Chile	Netherlands, Spain, Portugal, Brasil, Austrália, Jordan, Maldives

2.5.2 Assessment

A new release of the Data Space (OpenCoastS+) was rolled out into production in February 2022 to assemble on-demand hydrodynamics and water quality forecast systems for selected coastal areas and generate daily 2D and 3D predictions over the region of interest. The

new release offers researchers the possibility to predict a vast array of coastal dynamics variables (e.g.: the water levels, wave parameters, 2D and 3D velocities and 3D salinities and temperature), and selected water quality (fecal contamination, generic tracer) indicators in the forecast simulations. It also offers the possibility to compare water inundation extent against processed Sentinel remote sensing images. This new release is now fully integrated with the EGI Check-in[27] service and uses uDocker[28] to load the required software in the HTC and cloud resources, and it is also used as a component for other services (e.g. the EOSC-Synergy WORSICA - for water inundation delimitation). During the second part of the project the OpenCoastS+ Data Space will be further improved integrating additional solution offered by the EOSC Compute Platform, including the Infrastructure Manager (IM)[29] service to deploy and manage the cloud infrastructure, the EGI Data Transfer[30] service to exchange data between cloud and computing clusters, and the EGI Workload Manager[31] service to dispatch jobs across multiple resource providers of the EOSC Compute Platform. The Data Space will also be extended from a forecast-only service to hindcast and forecast runs.

The EOSC Compute Platform resources and the core services are an integral part of the sustainability of the OPENCoastS installation. The availability of these assets is fundamental to open the service to users worldwide in real life applications that have a societal impact either to support management actions under daily (engineering interventions, best periods to access ports, etc.) or emergency (storms, contamination events, etc.) context, or to enhance the capacity of researchers to study in detail processes or the long term impact of climate change or anthropogenic actions.

During the different period of observations we noticed a fluctuation of the metrics reported by the Data Space installation (see table above). This is mainly justified by the development activity undergone during the first part of the project, and the limited opportunities for live dissemination and training events due to COVID restrictions. Even if the new version of OPENCoastS has only been presented once since its release, an overall increase of the VA metrics was reported during the third period of observation. New dissemination activities are planned for the end of 2022 and 2023.

[27] https://www.egi.eu/services/check-in/
[28] https://github.com/indigo-dc/udocker
[29] https://www.grycap.upv.es/im/index.php
[30] https://www.egi.eu/services/data-transfer/
[31] https://www.egi.eu/services/workload-manager/

2.6 ENES Data Space

Description	ENES data space will deliver a single-entry point to an open and cloud-enabled data science environment for climate data analysis on top of the EOSC Compute Platform implemented in the project. The service brings a data science environment to the end users. It operates on top of the ENES Climate Analytics Service (ECAS), which is one of the EOSC-Hub Thematic Services in EOSC to deliver compute and analytics capabilities to the end users. Compute capacity will be allocated on demand by the EGI-ACE IM/EC3 tool. In addition to that, it will include “synda”, a community tool for data transfer and synchronization, which will be used to set up the climate data archive to be hosted in the ENES data space. Data collections will be shared via EGI DataHub. A JupyterLab front-end will provide the proper (from a data science perspective) entry point to such an environment, which will be enriched with a wide set of open-source scientific Python libraries. The service will provide access to (open) data from the ESGF federated data archive related to large community projects like CMIP6. The ENES data space will enable analytics capabilities on top of compute (and storage) capacity to support a wide range of data analyses. They include among others: trends, anomaly, climate change signal and extreme events analysis. Single and multi-model experiments will be supported either via interactive (exploratory) or batch data analysis to address different needs and requirements from the end-users. Moreover, the ENES data space is intended to address both data-intensive and data-driven compute scenarios, thus covering a wide spectrum of analytics needs from the community. From an open (data) science perspective, FAIR principles will be pursued; in particular openness and sharing of analytics applications (e.g. Jupyter Notebooks) will be fostered to increase their re-use among users.
Task	5.2
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	https://marketplace.eosc-portal.eu/services/enes-climate-analytics-service
Location	Hosted in EGI

Duration	M01-M30
Modality of access	Web interfaces
Support offered	Through a well-defined access workflow for analysis and support, users should gain the required skills to effortlessly use the proposed service. Support material (training, doc) will be provided in the access portal. General training activities are also foreseen.
Operational since	M7 (6 months at the beginning of the project will be used to set up the installation in EGI, in particular a preliminary set of relevant data collections, software ecosystem setup, test and validation)
User definition	Climate scientist/researcher running analytics tasks on the ENES Data Space

2.6.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M05	Period 2 M06-M10	Period 3 M11-M15
No. of active users	74 (for the ECAS service)	Internal accounting	N/A	11	24[32]
No. of registered users	40 (for the ECAS service)	Internal accounting	N/A	16	6
No. of use cases	10 (for the ECASE service)	Internal accounting	N/A	4	2

[32] Including number of users of the https://operations-portal.egi.eu/vo/view/voname/vo.enes.org VO

No. of countries reach	19 (for the ECAS service)	Internal accounting	N/A	4	5
Names of countries reach	Belgium, Cameroon, Croatia, Denmark, Finland, France, Germany, Greece, India, Italy, Qatar, Romania, Scotland, Slovenia, Spain, Sudan, Turkey, UK, USA	Internal accounting	N/A	Spain, Italy, France, Greece	India, Indonesia, Netherlands, Spain, Italy

2.6.2 Assessment

The ENES Data Space[33] is supported by two providers: CMCC and CNRS. This Data Space aims to build an EU data space for large-scale climate data analysis and serve the ENES scientific community. From a technical point of view, the ENES Data Space will deliver a single-entry point to an open and cloud-enabled data science environment for climate data analysis.

The ENES climate modelling community rolled out their new EGI-supported ENES Data Space service into production in November 2021. In the current release, the Data Space provides discovery and interactive analytics on top of a 150TB storage capacity data archive with the use of cloud and HPC resources. The setup is supported by TÜBITAK (TR) and UPV (ES) via dedicated Operational Level Agreements (OLAs)[34]. From Q1 2022, periodic new releases of the ENES Data Space are expected every 5 months.

The EOSC Compute Platform is instrumental to support the development of the climate data-science environment. More specifically, EGI-ACE is contributing to scale-up the available computing resources using the Infrastructure Manager (IM)[35] service as IaaS orchestrator and sharing the climate data archives hosted in the ENES data space via the EGI DataHub[36] service. From a technical perspective, the federated computing resources offered by the project help researchers to perform data analysis experiments on large

[33] https://marketplace.eosc-portal.eu/services/enes-data-space
[34] https://documents.egi.eu/document/3835
[35] https://marketplace.eosc-portal.eu/services/infrastructure-manager-im
[36] https://marketplace.eosc-portal.eu/services/egi-datahub

volumes of scientific data (more specifically NetCDF[37] data format for the climate domain) and allow them to address some key challenges and practical issues related to large-scale multi-model data analysis.

In terms of metrics, a negative trend was experienced during the third period of observations compared to the previous one. This is because the Data Space was under development during the first part of the project, and outreach and training activities officially started in Q1 of 2022 when the ENES Data Space was presented in a webinar[38] in March 2022. Moreover, a case study[39] was published for the EGI website to contribute to the promotion and service uptake. On top of this, the ENES Data Space architecture has been significantly enhanced with respect to the first version deployed in the first part of the project, so the service was not always operational during the third reporting period. In the near future, additional training events and dissemination activities are planned (e.g. EGU General Assembly[40], etc.) to further promote the Data Space and reach a wider range of users, thus expecting to increase the values of the collected VA metrics in the next periods of observations.

2.7 PROMINENCE

Description	The service will offer model validation based on both experimental and simulated results from any model or experiment where there is a suitable signal based on AI systems. The end goal is to provide a simulation verification service to EOSC users, allowing users to easily run HPC modelling codes and then use AI to compare the simulations to real experimental data. The service will offer access to actual fusion data from the MAST tokamak and possibly EPFL which are currently in the process of opening their data. The service will use the PROMINENCE system that is already available in EOSC and will build on the EGI-ACE HPC and GPU compute resources, OneData for storage, Check-in for AAI, INDIGO DEEPaas for carrying out the ML/DL training and inference, and SimDB for indexing the generated simulation data. It is anticipated that such a service will be of use to any community which performs significant modelling and uses existing experimental data to perform validation. Examples of such communities include astronomy and astrophysics, meteorology, environmental sciences, ecology and biosciences.
Task	5.3

[37] https://www.unidata.ucar.edu/software/netcdf/
[38] https://indico.egi.eu/event/5743/
[39] https://www.egi.eu/use-cases/research-infrastructures/enes
[40] https://www.egu.eu/meetings/general-assembly/

URL	
Service Category	Data Spaces and Analytics
Service Catalogue	https://marketplace.eosc-portal.eu/services/prominence
Location	UKAEA
Duration	M01-M30
Modality of access	Web interfaces
Support offered	Technical support for experiments, documentation for the simulation verification service, online tutorials and webinars, training sessions
Operational since	June 2019
User definition	A user from fusion community making use of the Prominence service to produce experimental data, papers, new diagnostic tools and new models describing the behaviour of the plasma -- Community users will be largely those who have developed the code and already used it in simulations -- AI experts within the community who are interested in this work and additional AI experts from other institutions

2.7.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of users requesting access	3	Internal service monitoring	0	2	2
No of jobs submitted	280	Internal service monitoring	371	3,122	15,495
No of countries reach	3	Internal service monitoring	1	1	1
Names of countries reach	UK, Korea	Internal service monitoring	UK	UK	UK

2.7.2 Assessment

The EOSC Compute Platform is instrumental for the PROMINENCE Data Space[41] to develop a service that will be of use to any community, including Astronomy and Astrophysics, Meteorology, Environmental Sciences, Ecology and Biosciences. Through this PROMINENCE Data Space users can perform significant modelling and use existing experimental data to perform validation. During the first part of the project, a total of 513 vCPU cores, 1.7TB of RAM, 3 GPGPU cards and 60TB of block storage resources were allocated to offer users instant access to the available resources. The capacity allocation is supported by TÜBITAK (TR) and CESGA (ES), UNIV-LILLE (FR) and CESNET-MCC (CZ) with dedicated Operational Level Agreements (OLAs)[42]. From a technical perspective, these resources were used by users to easily run HPC modelling codes and use AI models to compare the simulations to real experimental data. The HPC piloting activities to run JOREK non-linear MHD code[43] have started, and the integration with the EGI DataHub[44] service has been completed successfully. The integration of the PROMINENCE Data Space front-end with the EGI Check-in[45] service started in Q4-2021 and planned to be completed in Q2-2022. At the beginning of the project the Data Space planned to use the AI and Machine Learning solutions brought to the EOSC Compute Platform by the DEEP training facility to look for a particular type of disruptive event

[41] https://marketplace.eosc-portal.eu/services/prominence
[42] https://documents.egi.eu/document/3484
[43] https://www.jorek.eu/
[44] https://www.egi.eu/services/datahub/
[45] https://www.egi.eu/services/check-in/

known as an Edge Localised Mode (ELM) which appear as filaments which move around the outer edge of a plasma. This technical requirement has now a lower priority for this Data Space and the integration with the DEEP tools is not foreseen at the moment.

In terms of metrics, a considerable number of jobs submitted were reported by the Data Space during the third period of observation. This is primarily justified by the use of the computing resources for running plasma simulations and generating datasets. For the second part of the project the PROMINENCE Data Space will continue the integration of the HPC pilot, new documentation will be prepared, and outreach and dissemination activities will be organized to further promote the service uptake.

During the last period of observation, the following % of increment were registered for the Data Space:

- No. of jobs submitted (before the start of the project): 350[46]
- No. of jobs submitted at M15: 15,495, with an increment of +43,27%.

2.8 LOFAR Science Products

Description	This service will generate and make available science-ready data, first from LOFAR observational data but to be extended to other existing and future radio astronomical instruments and will provide essential operational experience for a European regional data center for the Square Kilometer Array. Moreover, the generated advanced data products are more easily accessible and usable for cross-domain science and will attract a much wider community than is currently served by the LOFAR Observatory. The service will build on HTC compute infrastructure of the project, and an advanced data product repository and open source pipelines. The service is not operational yet. EOSC-Hub delivered the main software components at the end of 2020, integration into EGI-ACE to be undertaken early 2021. The baseline metrics provided here are for the existing LOFAR archive of observational data.
Task	5.3
URL	

[46] Normalized metric (considering the last 15 months)

Service Category	Data Spaces and Analytics
Service Catalogue	https://marketplace.eosc-portal.eu/services/lofar-science-processing?q=LOFAR+Science+Processing
Location	SURFsara
Duration	M01-M30
Modality of access	Web interfaces
Support offered	The planned activities would encompass user support, training, manuals for the production and access of science ready data and pipelines on HTC infrastructure.
Operational since	N.A. (the service is to be integrated in 2020 from mature components, and will be outcome of EOSC-hub)
User definition	Researchers and communities, including RIs: - Any (radio) astronomer with a need for high quality science-ready images for specific objects or fields observed by LOFAR. - Advanced data products can be used for multi-frequency research by non-radio astronomers. - Derived data products are of interest for completely other domains such as ionospheric and space weather research.

2.8.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15

No of researchers requesting access to LOFAR	0	Internal service database/accounting	N/A	N/A	41
Amount of data accessed (PB)	0	Internal service database/accounting	N/A	N/A	0.000096
CPU/hours used for science product generation	0	Internal service database/accounting	N/A	N/A	167
No. of countries reach	0	Internal service database/accounting	N/A	N/A	15
Names of countries reach	-	Internal service database/accounting			Austria, Belgium, Bulgaria, China, Finland, France, Germany, Ireland, Italy, Latvia, Netherlands, Poland, Ukraine, United Kingdom, United States of America

2.8.2 Assessment

The LOFAR Science Processing Data Space[47] provides a service for helping the Radio Astronomy community to generate science-ready LOFAR data, enabling discoveries in astronomy to happen faster and more easily. This Data Space is supported by NWO-I and SURF providers. The first release of the LOFAR Science Processing Data Space was rolled out in production, and on-boarded in the EOSC Portal, at M12. As a direct consequence, initial metrics were collected starting from Period 3. The limited amount of data accessed reported in the table above, is related to a science case that is less demanding in terms of generated data than would typically be expected for LOFAR.

[47] https://marketplace.eosc-portal.eu/services/lofar-science-processing

Overall, the resources offered by the EOSC Compute Platform are contributing to open up the processing capabilities of the LOFAR Science Processing Data Space to a wider community of astronomers reducing the technical barriers to get access to high quality science-ready data products that have been observed by LOFAR. From a technical perspective, raw data is processed in order to create a wide range of data products that the LOFAR Science Processing Data Space is offering to the astronomy community.

To further promote the uptake of the LOFAR Science Processing Data Space, domain-specific training events will be organized to promote the Data Space and increase the users base in Europe. In June 2022 the new capabilities offered by this Data Space to the users will be presented during the LOFAR Family meeting. This event is the main gathering for LOFAR users and as such it is a good platform for reaching a wide and relevant audience. In the framework of the EGI-ACE project, the Data Space will also be presented in a webinar in June 2022.

2.9 SeaDataNet WebOcean Data Analysis

Description	An online version of the Ocean Data Analysis (ODV) software, which previously was only available as an offline software package. ODV is very popular worldwide among ocean researchers for analysing physical and chemical data collections. WebODV provides interactive exploration, analysis and visualization of oceanographic and other geo-referenced profile or sequence data. SeaDataNet is a successful network and innovator of dedicated data management standards, tools and services, and EGI is a successful partner in providing cloud hosting and computing services for the SeaDataNet research infrastructure. Deploying the online WebODV application at the EGI cloud infrastructure and mobilising its large scientific user basis, consisting of its existing offline users and new users, for trying out and adopting the WebODV cloud version for their science, will provide feedback for further improving the software and its success will have promotional impact on EOSC as an attractive platform for web-based science.
Task	5.4
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	https://webodv.awi.de/

Location	Alfred Wegener Institute (AWI), Germany
Duration	M01-M30
Modality of access	Web interfaces
Support offered	User access to the service via registration. Documentation, technical support, training webinars will be provided
Operational since	2019
User definition	A user is a person in SeaDataNet community or oceanographers from research institutes, universities, and companies. They use the webbodv service to analyse physical and chemical data sets, which are collected at sea using a range of platforms, such as research vessels, small boats, floats, gliders, and others, and a range of instruments such as CTDs, salinographs, water and sediment samplers, ADCPs, and other for studies on marine ecosystems and climate change related analyses

2.9.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of registered users	100	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
No of sessions	500	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A
No of countries reach	35	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A

Names of countries reach	Mostly European	SERVICE STILL IN INTEGRATION PHASE	N/A	N/A	N/A

2.9.2 Assessment

The SeaDataNet WebOcean Data Analysis Data Space is still in development and no metrics were collected so far. A first release of the Data Space is expected during Q2 of 2022. The on-boarding of the Data Space in the EOSC Portal will follow after that.

The SeaDataNet WebOcean Data Analysis Data Space is planned to be accessible by a portal. Through this portal users will be able to access a public instance of the WebOcean service, which will be used to display existing curated datasets from SeaDataNet[48] and ARGO[49] and perform data extraction. During the first part of the project, the public instance has been already installed at INFN-CLOUD-BARI cloud. The portal, which is also integrated with EGI Check-in[50], will also allow users to create private online Ocean Data View (WebODV) instances on the EGI Compute Cloud, where researchers can perform data analysis and have access to a dedicated storage space to use as a workspace. To facilitate the deployment of WebODV private instances transparently to the users, the portal has been integrated also with the EGI PaaS Orchestrator[51].

2.10 EMSO ERIC data services

Description	EMSO ERIC data services provide access to harmonized key ocean variables from 11 observatory nodes placed at key environmental sites across European seas, from the North Atlantic, through the Mediterranean, to the Black Sea. The EMSO ERIC data services are currently operated using EGI resources. These services include databases of harmonized EMSO ERIC data and metadata, data portal and dashboards supporting science-driven use case applications, machine-to-machine interfaces, data archive, DAP services, and virtual research environments.
Task	5.4

[48] https://www.seadatanet.org/
[49] https://monitoring.seadatanet.org/sdc/dashboard/
[50] https://www.egi.eu/services/check-in/
[51] https://marketplace.eosc-portal.eu/services/paas-orchestrator?q=PaaS+Orchestrator

URL	
Service Category	Data Spaces and Analytics
Service Catalogue	http://emso.eu/data/
Location	EMSO-ERIC
Duration	M01-M30
Modality of access	Web interfaces
Support offered	The planned activities would encompass user support, training, and continuous operation of the cloud-enabled systems
Operational since	2020
User definition	A user is a person making use of EMSO-ERIC data services.

2.10.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M05	Period 2 M06-M10	Period 3 M11-M15

No. of new users	200	Internal service database/accounting	644	844	489
No. of datasets served	6,000	Internal service database/accounting	N/A	N/A	N/A
No. of requests served	15,000	Internal service database/accounting	25,414	19,255	22,653
No. of data analysis run	200	Internal service database/accounting	N/A	N/A	N/A
No. of countries reach	30	Internal service database/accounting	95	90	86
Names of countries reach	Worldwide	Internal service database/accounting	Top5: Spain, Italy, China, USA and UK	Top5: China, Italy, Spain, USA, France	Top5: China, Spain, Italy, France, Germany

2.10.2 Assessment

EMSO ERIC offers data and services to a large and diverse group of users, from scientists and industries to institutions and policy makers. It is an extraordinary infrastructure to provide relevant information for defining environmental policies based on scientific data. The EOSC Compute Platform is contributing to operate and deliver the EMSO ERIC data services[52] and provide access to scientific data.

The resources and the solutions provided by the EOSC Compute Platform are instrumental to support the transition of the EMSO-ERIC data services from the pre-production to the production level. To support this transition, and maintain the operation of the EMSO ERIC data services, the project is contributing providing access to the federated resources of the EOSC Compute Platform and offering Authorization and Authentication solution (via EGI Check-in) to enable federated access of users to the EMSO ERIC data services. For what concerns the federated resources, a total of 492 vCPU cores, 1.7TB of RAM and 10.6TB of block storage resources have been allocated with a dedicated Service Level Agreement (SLA)[53] which has been extended until 06/2023.

In terms of metrics, as reported in the different periods of observation (see table above), most of them already met the target baseline. More specifically, a progressively increasing number of requests served by the EMSO ERIC Data Portal was registered over the three periods of observations. The two metrics: 'No. of datasets served' and '# of data analysis run' were not provided as they are no longer

[52] https://marketplace.eosc-portal.eu/services/emso-eric-data-portal
[53] https://documents.egi.eu/document/3539

representative to describe the level of maturity, nor explain how the Data Space is performing. For this reason, a request to remove/update these two metrics has been already submitted for the next project amendment.

During the last period of observation, the following % of increment were registered by the Data Space:

- No. of new users (before the start of the project): 250[54]
- No. of new users at M15: (644+844+489)=1977, with an increment of +690%. If we analyse the metric in the last 2 periods of observations, we notice a drop. This was primarily due to a significant reduction of use of the EMSO ERIC data services during the Christmas break and the lack of any important event during the last reporting period.
- No. of requests served (before the start of the project): 18,750[48]
- No. of requests served at M15: 22,653, with an increment of +20.81%.

2.11 GBIF Cloud data space

Description	In the framework of EOSC-hub, a number of services of GBIF Spain have already been made available through the EOSC Portal. This installation will be an integrated platform hosting all the GBIF data from all Iberian GBIF publishers, plus data from other GBIF publishers for the Iberian region and integrated storage and data analytics capabilities to support researchers perform data processing and visualisation online. The service integrated biodiversity data and geospatial data (climate, soil, land use, environmental variables, etc.). The service will provide new facilities in 3 areas: Localization (serving national conservation strategies, EU directives); More advanced visualisation and analysis capabilities; Integration between biodiversity data and geospatial data. The platform will orchestrate all the necessary EOSC/EGI services (AAI, EGI Jyputer notebook), made available through the EOSC Portal, and will support researchers in the area of biodiversity by connecting those data, with a layer of advanced computing and storage services.
Task	5.4
URL	

[54] Normalized metric (considering the last 15 months)

Service Category	Data Spaces and Analytics
Service Catalogue	https://marketplace.eosc-portal.eu/services/e-learning-platform-of-gbif-spain https://marketplace.eosc-portal.eu/services/gbif-spain-occurrence-records https://marketplace.eosc-portal.eu/services/gbif-spain-collections-registry https://marketplace.eosc-portal.eu/services/gbif-spain-images-portal https://marketplace.eosc-portal.eu/services/gbif-spain-regions-module https://marketplace.eosc-portal.eu/services/gbif-spain-spatial-portal https://marketplace.eosc-portal.eu/services/gbif-spain-species-portal https://marketplace.eosc-portal.eu/services/gbif-portugal-occurrence-records?q=GBIF+Portugal+Occurrence+Records
Location	Madrid and Lisbon
Duration	M01-M30
Modality of access	Web interfaces
Support offered	It is planned to organise training events and workshops as needed. A set of manuals and video tutorials will be available for some of the services.
Operational since	Services are already available in datos.gbif.es since 2015
User definition	A user of GBIF service, who can be: -- Researchers in biodiversity, and ecosystems in global change

	-- Policy making in the framework of the EU Green Deal directives -- Companies and the public sector working on land conservation and restoration, invasive species management, cultural ecosystem services

2.11.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of unique users	8,031	Internal logs	2,721	1,472	2,665
No of sessions opened	13,605	Google Analytics	4,635	2,712	5,457
No of page views	79,071	Google Analytics	30,717	18,802	45,643
Data stored (TB)	34	Internal logs	6.6	7.3	10.6
No of downloads	42,363	Internal logs	652	249	672
No of registries downloads	426,795,567	Internal logs	652	14,456,047	42,502,362
No of registries visualized	51,907,016	Internal logs	2,384,996	2,443,061	2,466,553
No of countries reach	59	Google Analytics	115	42	56
Names of countries reach	Worldwide	Google Analytics	Spain 60 % , US 4.9 %, China 3.6 %, Ecuador 2 %, Germany 1.6 %, Brazil 1.6 %, Mexico 1.5 %, France 1.25 %, Colombia 1.1 %, Others 21.1 %	Spain 70.1%, USA 10 %, China 5.8 %, Colombia 1.8 %, Mexico 1.8 %, Argentina 0.8 %,Germany 0.8 %, Finland, 0.7 %, UK 0.7 %,Others 7.5 %	Spain 78.8%, USA 5.6%, China 2.4%, Mexico 1.5%, Others 11.7%

2.11.2 Assessment

GBIF (the Global Biodiversity Information Facility)[55] is an international network and data infrastructure funded by the world's governments aimed at providing anyone, anywhere, open access to biodiversity data. In the context of the EGI-ACE project the Data Space is supported by the two providers: LIP and CSIC. During the first part of the project the GBIF Cloud Data Space focused on the integration of datasets hosted from GBIF Spain and Portugal. This integration activity required primarily architectural support from the project. As a result of this integration, the GBIF Portugal Occurrence Records[56] was registered in the EOSC Portal in Feb. 2022. As a next step, the GBIF Cloud Data Space is now validating the solution with real data before publishing the integrated portal in EOSC. This is expected for Q3 of 2022. For the second part of the project the current AAI model, based on CAS Enterprise Single Sign-On, will be further extended with the federated authentication and authorization framework supported by the EGI-ACE project. Additionally, the benefits of using EGI Jupyter notebooks as an additional interface to access data for further exploitation will be investigated.

The collaboration started in the framework of the EGI-ACE project is strategic for the deployment in EOSC of a European platform to support the integration of biodiversity data. Through this platform the biodiversity data, collected from different European countries, will be offered to end-users without potential breaks that political borders may impose on data.

In terms of metrics, fluctuations were reported during the second period of observation (see table above). These fluctuations are primarily justified by the integration activity undergone during the first part of the project. With the validation of the architecture, we expect these fluctuations to disappear and increase the values of the metrics collected.

During the last period of observation, the following % of variation were registered by the Data Space:

- No. of unique users (before the start of the project): 10,038[57]
- No. of unique users at M15 (normalized): (2,721+1,472+2,665)=6,858. Compared to the baseline, the % of variation is still negative (-31,68%) however, a significant increase was reported compared to the second period of observation. The same analysis applies to other metrics reported in the table above.

[55] https://www.gbif.org/
[56] https://marketplace.eosc-portal.eu/services/gbif-portugal-occurrence-records
[57] Normalized metric (considering the last 15 months)

2.12 Disaster mitigation and agriculture

Description	As a result of EGI-Engage and EOSC-hub projects the disaster mitigation communities from the Asia-Pacific region developed and offered 2 simulation portals in EOSC (tsunami wave propagation simulations and for WRF-based weather simulation). These installations will continue and will be expanded with three simulation portals for fire/haze/smoke monitoring, flood, typhoon/cyclone, tsunami, storm surge and agriculture research - based on Asia-Pacific and European expertise, datasets and regional e-infrastructures. The user community has been extended from 6 core countries (TW, PH, VN, MY, TH, ID) to open participation via APAN, including agriculture, remote sensing, and biodiversity & ecological monitoring, also teamed up with Sentinel Asia and earth observation communities to support the quantitative hazard risk analysis and disaster management in Asia and Europe.
Task	5.4
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	
Location	Taiwan, AS(ASGC)
Duration	M01-M30
Modality of access	Web interfaces
Support offered	Helpdesk, Technical support, Training and Webinars

Operational since	2018
User definition	Researchers working in disaster simulation, agricultural monitoring, land observation, civil protection.

2.12.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No. of new registered users	150	Internal service database/accounting	N/A	N/A	N/A
No. of simulation jobs run	800	Internal service database/accounting	N/A	N/A	N/A
No. of countries reach	13	Internal service database/accounting	N/A	N/A	N/A
Names of countries reach	Taiwan, Philippines, Vietnam, Thailand, Myanmar, India, Japan, Malaysia, Bangladesh, Indonesia, Czech Republic, Italy, Germany	Internal service database/accounting	N/A	N/A	N/A

2.12.2 Assessment

The Disaster Mitigation and Agriculture is one of the unfunded Data Space supported by the project. To demonstrate the integration of advanced distributed cloud infrastructure and simulation portals, case studies as well as knowledge discovery in the Asia region for reduction of natural hazard impacts in various aspects, the Data Space focuses on the following tasks:

- Develop and re-organize simulation portals to make use of EOSC cloud in Asia and Europe on hazards including weather, fire/haze/smoke monitoring, flood, typhoon/cyclone, tsunami, and storm surge.
- Conducting a case study in Thailand to understand weather parameters impact on agriculture production (JP, TH, PH, TW).
- Keep on supporting case studies proposed by partners in Asia and improving the risk analysis workflow and functionality of simulation portals coordinated by Taiwan (ASGC), such as flood (MM, VN, MY), lightning (BD), storm surge and tsunami (PH, ID), forest fire/haze/maze monitoring (TH and ASEAN).

In the context of the EGI-ACE project:

- The iCOMCOT portal recently passed the validation by scientists in 2021. The iCOMCOT portal is currently running in the Asian cloud infrastructure composed of ~1000 vCPU cores, 8 GPU cards, and 20 TB of storage. To encourage resource sharing and offer researchers access to the EOSC Compute Platform to run numerical models and improve the risk analysis workflow and functionality of the simulation portals, the vo.environmental.egi.eu[58] Virtual Organization (VO) was configured in the EGI Operations Portal and initial resources of 16 vCPU cores, 48 GB of RAM, and 1 TB of block storage were allocated in one of the providers of the EGI Federation. During the second part of the project the iCOMCOT portal will be connected to the EOSC Compute Platform. Additionally, the benefits of using EGI Jupyter notebooks as an additional interface to access data for further exploitation will be also investigated. The on-boarding of the iCOMCOT portal by the service provider in the EOSC Portal is expected for Q4 of 2022.
- The Storm Surge portal is currently in validation, and it is expected to be available in Q4 of 2022.

In terms of dissemination and outreach activities, several events were organized in the Asian region to promote the collaboration around national hazards in the Asia region, including the APAN53[59] and the ISGC 2022[60] conferences.

2.13 OPERAS Metrics service and Certification service

Description	Developed in HIRMEOS. The service collects usage and impact metrics related to Open Access monographs from various different sources and allows for their access, display and analysis from a single access point. The OPERAS Metrics Suite consists of a

[58] https://operations-portal.egi.eu/vo/view/voname/vo.environmental.egi.eu
[59] https://apan53.apan.net/
[60] https://indico4.twgrid.org/event/20/

	shared data model, various open-source tools and services designed to serve the various components used by the shared OPERAS database and API used for a diverse range of usage and impact metrics including downloads, web visits, tweets, Wikipedia mentions, etc. The Certification service is operated by DOAB, which collects the variety of peer reviewing practices from hundreds of monograph publishing houses, categorizes them, and provides a single access point to the list of certified peer reviewed monographs available in Open Access in the world. DOAB is a digital directory of peer-reviewed Open Access books and Open Access book publishers. The primary aim of the service is to increase discoverability of OA books so that they can reach a broader audience. The Certification Service operates as a quality insurance service for the benefit of readers and the service providers working with them, such as the libraries.
Task	5.5
URL	
Service Category	Data Spaces and Analytics
Service Catalogue	https://metrics.operas-eu.org/
Location	Metrics: Hosted in EGI (site to be defined at the beginning of the project), Certification: Hosted by Huma-Num at IN2P3 (France)
Duration	M01-M30
Modality of access	Web interfaces and APIs
Support offered	The planned activities would encompass user support, training, and continuous operation of the service and core EGI services (e.g. AAI). The Metrics service will use the EGI Cloud Container Compute (Kubernetes). Technical and scientific staff directly working for the provision of virtual access (Ubiquity Press for OPERAS AISBL).

Operational since	June 2019
User definition	A typical user is publishers, SSH researchers, research engineers, librarians, also citizens

2.13.1 Metrics

Metric name	Baseline	Define how measurement is done	Period 1 M01-M5	Period 2 M06-M10	Period 3 M11-M15
No of registered publishers	6 (Metrics) + 7 (Certification)	Internal	Same as baseline	N/A	N/A
No of API hits per day	100,000	Internal	Same as baseline	N/A	N/A
No of countries reach	237 (Metrics) + 5 (Certification)	Internal	Same as baseline	N/A	N/A
Names of countries reach	France, UK, Sweden, Germany, Greece	Internal	Same as baseline	N/A	N/A

2.13.2 Assessment

The OPERAS Metrics service[61] is one of the unfunded Data Space supported by the project. An initial resource capacity allocation was activated at IN2P3-IRES in France with 10 vCPU cores, 20GB of RAM and 1TB of block storage[62]. It is important to note that the planned usage of the EGI infrastructure, supported by the EGI-ACE project, is to support an operational level service of OPERAS. Therefore, this means that a carefully planned technical shift from the current operational environment into a new environment within the EGI

[61] https://marketplace.eosc-portal.eu/services/operas-metrics-service
[62] https://documents.egi.eu/document/3712

infrastructure required a higher-than-average time and effort. Though important for the long-term, due to the lack of staff, the workplan was delayed regarding the planned usage of the resources provided, which is the main reason why no metrics were reported in the three periods of observation.

In addition to the resources allocated as part of EGI-ACE, IN2P3-IRES has pledged continued support beyond the life of the project that would be re-evaluated on an annual basis, which was an important consideration with regards to the investment of not only the time required to make the shift of technical environments but provide the confidence in longer-term stability of the operational service. This agreement has only recently been discussed, but the subsequent work has already begun between the OPERAS metrics development teams and the EGI-AGE technical support to facilitate the deployment and the operation, which is based on docker containers that are deployed in a Kubernetes cluster, and the support to the Infrastructure Manager (IM) was enabled. Instructions to deploy and operate Kubernetes clusters in the EOSC Compute Platform with the IM were shared with the main contacts therefore the workplan is in progress.

This work is expected to be completed in the next 6 months with the first release of the OPERAS Metrics service installation. During the second part of the project, the OPERAS Metrics service installation will be further integrated in the EOSC Compute Platform.

3 Satisfaction

In this section we report the customers' satisfaction of the Data Space installations. In particular, those that are operating at pre-production/production level are taken into consideration.

3.1 The WeNMR Thematic Services

The WeNMR Thematic Services by design include a mechanism to constantly monitor the level of satisfaction of the services offered to their users. Customers' feedback is mainly used for improving the performance and the functionalities offered by the services. During the reporting period, 12 training events were organized by WeNMR. Overall, the level of satisfaction[63] received by the WeNMR Thematic portal is shown in the Table 6.

Table 6 - WeNMR Thematic Services satisfaction (source https://wenmr.science.uu.nl/stats)

Thematic Services	User's feedback
DisVis Portal	4.8 (from 77 respondents)
HADDOCK2.4	4.9 (from 1,652 respondents)
PowerFit Portal	4.8 (from 19 respondents)
SpotOn Portal	4.7 (from 82 respondents)

3.2 The Virtual Imaging Platform

As part of the webinar programme organized by T2.3, the status of the Virtual Imaging Platform (VIP) Data Space installation was introduced in 2022. The VIP webinar was attended by 46 participants from 25 different countries. The overall feedback received during the webinar was positive as shown in the Table 7:

Table 7 - Customers' satisfaction feedback of the VIP Data Space

Webinar Title	Overall Webinar[64]	Content of the Webinar
The Virtual Imaging Platform: Scientific Applications as a Service and Beyond[65]	4.2 (from 9 respondents)	4.3 (from 9 participants)

[63] The level of satisfaction is measured from 1 (min) to 5 (max).
[64] On a scale of 1 to 5 with 5 being highest.
[65] https://indico.egi.eu/event/5824/

3.3 The ENES Data Space

Also the ENES Data Space was introduced in a webinar in 2022 as part of the webinar series organized by T2.3. The webinar was attended by 44 participants from 18 different countries. The overall feedback received from participants is shown in Table 8:

Table 8 - Customers' satisfaction feedback of the ENES Data Space

Webinar Title	**Overall Webinar[60]**	**Content of the Webinar**
The ENES Data Space Service[66]	4.5 (from 13 respondents)	4.5 (from 13 respondents)

3.4 EMSO ERIC Data Service

On 20-22 October 2021, the resources of the EOSC Compute Platform were used to host the EMSO Time Series training[67] session that took place in the Canary Islands, Spain. During the event, in particular during the hands-on sessions, participants explored how to profit from the EOSC computing infrastructure using Jupyter notebooks to provide cost-efficient information for the assessment of marine mammal populations, the detection of fish reproduction areas, the detection of greenhouse gas seeps from pipelines and deep-sea carbon storage, gasification of methane clathrates, adverse meteorological conditions, detection of low-frequency seismic events, ice-cracking, ocean basin sound-velocity tomography and acoustic communication.

[66] https://indico.egi.eu/event/5743/
[67] https://tsc2021.emso.eu/

4 Service Orders

For the Data Space installations already registered in the EOSC Portal Catalogue and Marketplace[68], we report here the statistics of the service orders received during the first 15 months of the project. These statistics were collected from the EOSC Metric Portal[69].

Table 9 - Number of Service Orders (SOs) related to WP5 Data Space installations (during period Jan. 2021 - March 2022)

WP5 Data Space installations	Service Orders
Haddock2.4 Web Portal	3
DisVis Portal	2
European Galaxy Server	2
AMBER-Based Portal Server	1
Powerfit Web Portal	1
ENES Climate Analytics Service	1
OpenCoastS Portal	1

[68] https://marketplace.eosc-portal.eu/
[69] https://opsportal.eosc-portal.eu/metricsEOSC/ServiceOrder/2021-01-01/2022-03-31/stats/on#

Appendix I - Status of the WP5 integration activities

Figure 10 - Service adoption within the Data Space Installations

	WeNMR services suite	Virtual Imaging Platform	OpenRiskNet	useGalaxy.eu	OpenCoastS	ENES Data Space	PROMINENCE	LOFAR Science Products	SeaDataNet WebOcean Data Analysis	EMSO ERIC data services	GBIF Cloud data space	Disaster Mitigation and Agriculture	OPERAS Metrics and Certification services
WP3, WP4, WP6 and WP7													
EGI Cloud Compute	Adopted	Adopted	Planning		Adopted	Integrated	Adopted		Integrated	Adopted	Planning	Planning	Planning
EGI High-Throughput Compute	Adopted	Adopted			Adopted			Integrated					
EGI Online Storage	Adopted	Adopted	Planning		Adopted	Integrated	Adopted	Integrated	Integrated	Adopted	Planning	Planning	Planning
Infrastructure Manager					Planning	Integrated							
EGI Workload Manager	Adopted	Adopted		Investigating	Adopted								
EGI Notebooks		Investigating									Investigating	Investigating	
CVMFS	Adopted	Adopted							Integrated				
EGI Check-in	Adopted	Integrated	Investigating	Planning	Integrated	Integrated	Planning		Integrated	Adopted			Planning
EGI DataHub				Planning		Planning	Integrated						
EGI Data Transfer					Planning			Investigating					
PaaS Orchestrator									Integrated				
EC3						Integrated							
HPC	Investigating					Integrated	Integrated						

Adopted	Technology/service was already integrated before the EGI-ACE
Planning	Integration is ongoing in the context of the EGI-ACE project
Integrated	Technology/service was integrated in the context of EGI-ACE
Investigating	Technology/service is considered for adoption, but the integration and assessment work is yet to start