ENVRI
FAIR

D10.6
INITIAL REPORT ON EPOS POLICIES AND GOVERNANCE

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Deliverable abstract

D10.6 "Initial Report on EPOS Policies and Governance for FAIR and EOSC" describes the work done towards ensuring clear policies are in place with the governance to provide assurance. It builds on MS66.

In this deliverable we therefore describe the EPOS policies and associated governance.

It should be noted that a new Policy Group has been set up within EPOS to review policies, provide policies where missing, propose appropriate governance and commission IT support.

DELIVERY SLIP

	Name	Partner Organization	Date
Main Author	Keith G Jeffery	UKRI	2020-12-07
Contributing Authors	Daniele Bailo	INGV	2020-12-07
Reviewer(s)	Zhiming Zhao	UvA	2020-12-11
	Ari Asmi	UHEL	2020-12-18
Approver	Andreas Petzold	FZU	2020-12-29

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DOCUMENT AMENDMENT PROCEDURE

Amendments, comments and suggestions should be sent to the Project Manager at manager@envri-fair.eu.

GLOSSARY

A relevant project glossary is included in Appendix A. The latest version of the master list of the glossary is available at http://doi.org/10.5281/zenodo.3465753.

PROJECT SUMMARY

ENVRI-FAIR is the connection of the ESFRI Cluster of Environmental Research Infrastructures (ENVRI) to the European Open Science Cloud (EOSC). Participating research infrastructures (RI) of the environmental domain cover the subdomains Atmosphere, Marine, Solid Earth and Biodiversity / Ecosystems and thus the Earth system in its full complexity.

The overarching goal is that at the end of the proposed project, all participating RIs have built a set of FAIR data services which enhances the efficiency and productivity of researchers, supports innovation, enables data- and knowledge-based decisions and connects the ENVRI Cluster to the EOSC.

This goal is reached by: (1) well defined community policies and standards on all steps of the data life cycle, aligned with the wider European policies, as well as with international developments; (2) each participating RI will have sustainable, transparent and auditable data services, for each step of data life cycle, compliant to the FAIR principles. (3) the focus of the proposed work is put on the implementation of prototypes for testing pre-production services at each RI; the catalogue of prepared services is defined for each RI independently, depending on the maturity of the involved RIs; (4) the complete set of thematic data services and tools provided by the ENVRI cluster is exposed under the EOSC catalogue of services.

TABLE OF CONTENTS

ENVRI
FAIR

D10.6 - Initial Report on EPOS Policies and Governance

1 Introduction

1.1 The Project

The ENVRI-FAIR project is engaging Research Infrastructures (RIs) in the environmental domain covering the subdomains Atmosphere, Marine, Solid Earth and Biodiversity / Ecosystems. The overarching goal of ENVRI-FAIR is that all participating RIs will improve their FAIRness and become ready for connection to the European Open Science Cloud (EOSC). This deliverable provides policy guidelines for EPOS and associated governance. The deliverable has been hampered due to a lack of policies emerging from WP4. Also, no other subdomain has a milestone such as MS66 so there is little opportunity for evolutionary convergence.

However, ENVRI-FAIR D4.2 does provide an initial policy landscape document. While not defining policies that could be used, it indicates the 'state of play' concerning Licences, Persistent Identifiers, Metadata, Retention, Data Access, Ownership and Rights, Service Availability, Policy Availability.

1.2 The solid earth subdomain

The main aim of WP10 is to (a) understand the current situation in solid earth subdomain; (b) provide a roadmap to improve FAIRness; (c) implement the roadmap with support from WP7 based on convergent architectural elements defined by WP5. Clearly this has to be done within the ENVRI policy framework of D4.2.

EPOS is organised as (1) the Integrated Core Services (ICS) system and (2) the TCS (Thematic Core Services) systems. The TCS (currently 10 communities soon rising to 12) have their own asset suppliers within the community and both the asset suppliers and the TCS communities have their own policies and governance. The ICS provides an overarching harmonisation layer consisting of (a) a rich metadata catalog in Common European Research Information Format (CERIF)[1] format into which metadata describing the assets from asset suppliers in each TCS are stored, after conversion from the asset supplier local metadata format to CERIF via EPOS-DCAT-AP[2]; (b) software to provide a web portal to the catalog for discovery and contextualisation and subsequent operations to access the selected assets in execution (services) or download (datasets) modes. The ICS has policies and governance are agreed by the whole EPOS community and governance relationships - through contracts and terms and conditions of use - are being developed between ICS and TCS to ensure policy-led governance.

1.3 Policies overview

The aim of policies for the solid earth domain – represented by EPOS-ERIC – is to provide an excellent, high quality, responsive service to the community at appropriate cost. EMSO ERIC, as a contributing RI, aims at aligning with the sub-domain representing RI (EPOS) for harmonization activities and services delivered through EPOS-ERIC.

The policies of EPOS-ERIC are, of course, subject to relevant International and National legislation.

The policies of ICS are agreed by the whole community whereas the policies of each TCS - and asset suppliers within each TCS - are determined locally. Many TCS / asset supplier organisations also have international agreements with others and their policies - and that of EPOS as a whole represented by the ICS - have to be aligned.

The EPOS data policy, and a description of EPOS including policies and governance are attached as annexes.

Policies are approved by the Systems Coordination Committee SCC: (representing the TCS), the IT Board (ITB: representing IT) and the Executive Committee (EC: representing EPOS-ERIC) if necessary, with ratification by the General Assembly (GA: representing stakeholders).

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[1] https://www.eurocris.org/services/main-features-cerif
[2] https://github.com/epos-eu/EPOS-DCAT-AP

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FAIR

1.4 Governance Overview

The governance principles relate to the aim of providing an excellent, high quality, responsive service to the community at appropriate cost.

The EPOS-ERIC Governance is based on an Executive Director, supported by the EPOS-ERIC Coordination Office (ECO), mandated by the GA and advised by various bodies. The IT system governance is based on ITB chaired by the EPOS-ERIC ECO IT Officer with managers of Interaction (with users), Development, Operational and links with other activities functions, and a TCS representative. Thus, there are clear responsibilities for each of the IT functions, for IT overall (including TCS) and for IT within the EPOS-ERIC.

The relationship of EPOS-ERIC governance, and its implementation in ICS, to that of each TCS (and if necessary, asset supplier within TCS) is being worked on actively and is the subject of contracts between EPOS-ERIC and TCS. Similarly, the relationship between EPOS-RIC and the Hosting Organisation Consortium (HO: provides the e-infrastructure to support ICS) is the subject of contracts.

2 Policy Areas

The policy areas discussed below were defined by a policy group within EPOS set up by ECO.

2.1 Users

2.1.1 Registration

The current policy and implemented ICS system allows anonymous access. It does not permit anonymous provision - and this is controlled by the TCS communities. Once a user has discovered assets of relevance, further action requires self-registration. On accessing the EPOS portal website, a user is agreeing to the terms and conditions. User consent to a new disclaimer, the use of cookies, terms and conditions including acceptable use and informed consent acceptance of General Data Protection Regulation (GDPR) is under development. The TCS communities, including asset suppliers, have their own policies. Current work includes examining those policies and providing harmonised governance throughout EPOS.

2.1.2 Acceptable Use

The acceptable use policy covers:
· Use for legitimate purposes
· Responsible use of resources
· No expectation of privacy or security
· Responsibility for passwords
· No illegal or inappropriate material
· Following defined procedures
· Respecting licensing

2.2 Data and Information

2.2.1 Data Management

EPOS asset suppliers maintain Data Management Plans (DMP) covering the assets with appropriate policies[3]. Policies for other assets (such as equipment) are under development. EPOS ICS has a rich metadata catalog in CERIF, used for discovery, contextualisation and (after registration) for accessing and (re-)using assets, themselves curated by the TCS communities who also supply - via EPOS-DCAT-AP - metadata records to the catalog.

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[3]https://www.epos-eu.org/sites/default/files/repository/PDFFiles/EPOS%20DATA%20POLICY_July2018.pdf

2.2.2 FAIR

FAIR consists of a set of principles for Findability, Accessibility, Interoperability and Reusability to which EPOS attempts to adhere. The interpretation of the principles to an operational environment is not always straightforward. EPOS has participated in the original principles' formulation (through Force 11) and Research Data Alliance (RDA) FAIR Data Maturity Model Working Group[4] which provided a useful interpretation of what the FAIR principles mean in practice. EPOS has also cooperated with projects such as GO-FAIR and FAIR's FAIR. EPOS (particularly the EPOS-ICS system) is already FAIR but there is always room for improvement.

2.2.3 Security

Security for data and information means ensuring access to registered users in appropriate roles for authorised purposes and preventing other access. EPOS provides appropriate security. Detailed work on policy in EPOS is ongoing including an authorisation policy and its implementation.

2.2.4 Privacy

Privacy concerns protection of information about an individual, either as data describing that person or records of activity of that person. EPOS does not store sensitive personal information (e.g., health data) as assets but does hold personal information sufficient to ensure security and also personal information attached to assets as metadata e.g., owner of a dataset. Thus, GDPR has to be respected.

2.2.5 Availability

Availability concerns ensuring data and information are available whenever required to authorised persons. This relates also to business continuity (see below). EPOS has availability targets. The main system is replicated across sites in two countries with appropriate failover. Assets are subject to policies (e.g., DMPs) to ensure availability. This links with curation and provenance.

2.2.6 Curation (and Provenance)

Curation involves selecting what data and information to preserve and what to discard in each case over what time period. Associated with curation is provenance recording all actions taken on data or information thus providing a history of the evolution of the dataset to be used for (a) assessing relevance and quality for the purpose; (b) reproducibility for scientific purposes; (c) audit. EPOS has a policy for curation and is developing one for provenance.

2.3 Software

In addition to the policy aspects for data and information described above, for software additional – and intersecting – policies are required.

2.3.1 Open Source

The general EPOS policy is to use and create open-source software. Although clear licences have not been defined yet, several options are currently being investigated, namely:

a) The MIT License, a permissive free software licence that puts only very limited restriction on reuse and has, therefore, high license compatibility[5].
b) The GNU General Public Licence (GNU GPL or simply GPL) is a series of widely used free software licences that guarantee end users the freedom to run, study, share, and modify the software. The GPL series are all copyleft licences, which means that any derivative work must be distributed under the same or equivalent licence terms[6].

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[4] https://www.rd-alliance.org/groups/fair-data-maturity-model-wg
[5] https://en.wikipedia.org/wiki/MIT_License
[6] https://en.wikipedia.org/wiki/GNU_General_Public_License

c) Creative Commons CC BY: This licence lets others distribute, remix, adapt, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials[7].

For any potential commercial use, the Apache licence might be considered[8].

2.3.2 Re-Use

EPOS re-uses existing software wherever appropriate (functionality, licensing) to reduce costs and to increase reliability. When software is open source, EPOS complies with the original licence requirements and tries to find the best compromises in order to reuse the software with the potentially selectable open-source software licences discussed above.

2.3.3 Development, Change Management and QA Procedures

EPOS has a software development change management / Quality Assurance (QA) process running from user requirements management through software development and deployment to operations. It is supported by GitLab and associated DevOps processes.

2.4 System

In addition to the policy aspects for data and information described above, for the system as a whole, including the e-Infrastructure, additional – and intersecting – policies are required.

2.4.1 Availability

System availability has policy-driven targets. The use of mirrored operational systems across two organisations increases availability to meet the targets.

2.4.2 Access

Access to the system is by anonymous users (see above). With access comes obligations (agreement to disclaimers etc.) as described above. Access for provision of metadata describing assets is by authorised users only from the TCS communities utilising a pipeline process with appropriate quality checks at each stage.

2.4.3 Disaster Recovery/Business Continuity

The system security (firewalls etc.) are designed to prevent disasters such as intrusion or distributed denial of service attacks. Business continuity is protected to a large extent by mirrored systems with onsite and offsite backup mechanisms to preserve the ICS system. The asset suppliers of the TCS communities have their own policies.

2.5 Other Assets

EPOS encompasses also facilities and equipment ranging from sensor arrays to laboratory equipment with associated services. EPOS is developing policy in these areas based on their use within EPOS (including Trans-National Access (TNA)).

3 Governance Areas

In general, the governance areas follow closely the policy areas and so the information from Section 2 is not repeated. Only novel aspects related to governance are documented.

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[7] https://creativecommons.org/licenses/?lang=en
[8] https://www.apache.org/licenses/LICENSE-2.0

3.1 Users

3.1.1 Registration

The registration process is defined. End users will accept the EPOS disclaimers and consents. At present user login (i.e., user identification) occurs when the end-user starts to access assets (i.e., after discovery). This may need to change if it becomes necessary to record user consent to disclaimers and consents.

3.1.2 Acceptable Use

The system requires positive acceptance of terms and conditions, (and soon) improved terms and conditions, disclaimer, cookies and personal data privacy under GDPR.

3.2 Data and Information

3.2.1 Data Management

Governance of the DMPs is done by review at each governance level in EPOS within the context of the EPOS overall data policy (ANNEX 1).

3.2.2 FAIR

Governance and evaluation of FAIRness has been done within the ENVRI-FAIR context and reported in appropriate deliverables and milestones

3.2.3 Security

Security is governed through the governance levels of EPOS. Implementation is by the hosting organisations within their own procedures. These cover physical as well as cyber security.

3.2.4 Privacy

Privacy is governed through the governance levels of EPOS. Implementation is by the hosting organisations. Further work is underway on the governance of personal data privacy as under GDPR.

3.2.5 Availability

Availability is governed through the governance levels of EPOS. Implementation is by the hosting organisations.

3.2.6 Curation (and Provenance)

Curation is governed through the governance levels of EPOS and relates to the DMP. Implementation is by the hosting organisations. The key aspect is the population of the rich metadata catalog as curation actions/processes are performed.

3.3 Software

3.3.1 Open Source

A governance policy on software licensing covering source, libraries and binaries is being developed. It is likely to be managed by ITB. It relates to software release from GitLab to GitHub where appropriate protection is required in the public sphere.

3.3.2 Re-Use

The licences chosen determine the conditions for re-use for any piece of software. Hence the governance policy on licensing being developed.

3.3.3 Development, Change Management and QA Procedures

EPOS has a change management / QA pipeline from development through staging to operational or production use with appropriate testing at module, regression, integration and user levels. This is overseen by ITB.

3.4 System

3.4.1 Availability

The governance of availability is based on the KPIs for availability in the Service Level Agreement. This is monitored by EC.

3.4.2 Access

Access is controlled by the registration process at present. More granular access through authorisation mechanisms is under development and is aligned with the AARC/GEANT blueprint architecture.

3.4.3 Disaster Recovery/Business Continuity

The plan for these eventualities is governance by ITB and EC. The provision and maintenance of the implementation is the responsibility of the hosting organisations.

3.5 Other Assets

Within the scope of ITB a pitch has been defining the requirements for representing facilities and equipment in terms of metadata required and software services required to provide access.

4 Current State

This section summarises the current state of policy and governance in each of the policy areas.

Policy Area	State of Policy	State of Governance
Users	Defined and documented. Now being evolved to meet new requirements	Governance of policy through SCC and ITB to EC for approval and, if necessary, GA.
Data and Information	Defined and documented. Now being evolved to improve authorisation of access	Assets to be included in the EPOS ICS CERIF Catalog authorised by a defined procedure which has appropriate criteria. Governance of policy through SCC and ITB to EC for approval and, if necessary, GA.
Software	General agreement on open source but licensing policy not yet defined – ongoing work	Software development has a well-defined process based on 'Shape-Up' methodology including authorisation to proceed with developments and a strict QA procedure for change control. Governance by ITB.
System	Defined and documented.	Governance through hosting agreement of CO with e-Infrastructure suppliers in EPOS. Governance by EC and GA. Strong governance on change control.
Other Assets	General policies defined. Ongoing work on detailed policies concerning access to facilities and equipment.	Requirements agreed at SCC before entering the Data and Software governance processes.

5   Overview of the EPOS Policy/Governance Framework

5.1   Introduction

This section brings together all the threads discussed above into a cohesive framework. Sections 2 and 3 above describe the existing framework, summarised in Section 4. However, EPOS is now taking a more comprehensive approach, incorporating and evolving the existing policies, and governance and filling identified gaps. It should be noted that policy and governance work is continuous, as the landscape changes due to changes of legal and best practice frameworks, change of research priorities and directions, change of relationships between stakeholders in EPOS and other factors. Furthermore, such work takes much staff effort. The new approach follows from the EPOS overall Policy and Principles. This may be managed by Responsible Research and Innovation (RRI) policies concerning people, and Asset policies concerning assets such as data, data products, software, services and (later) facilities and equipment (Figure 1). These policies are maintained and evolved by governance structures and enacted through the IT system utilising the 'building blocks' shown in (Figure 1) within a framework of AAAI and rich CERIF metadata catalog depicted as the ellipse.
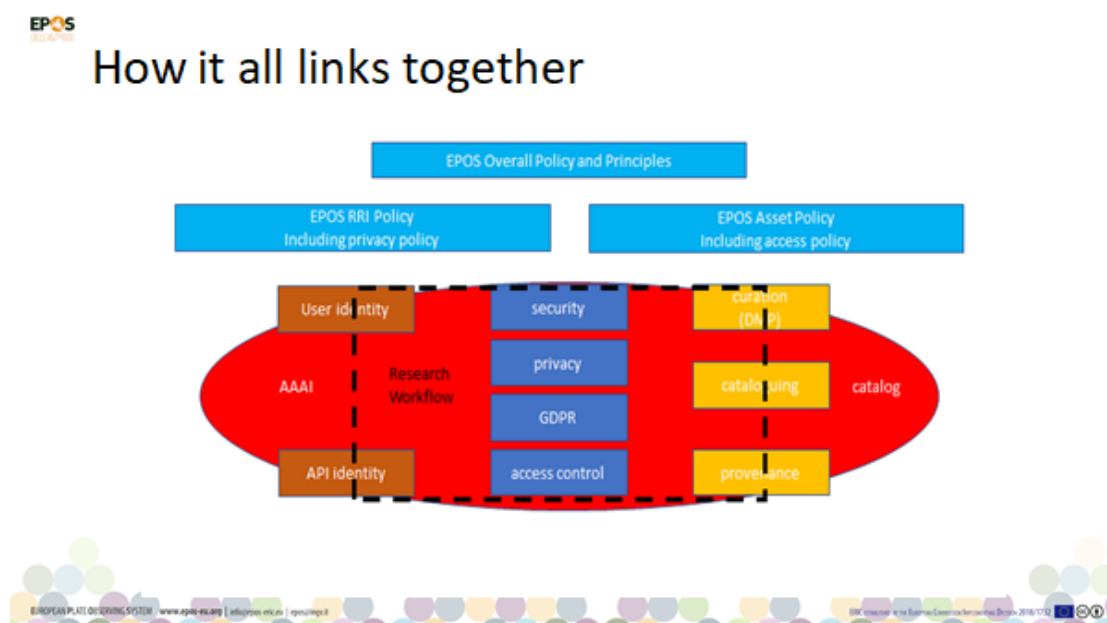

Figure 1: How it all links together

5.2   The EPOS Policy Group

Within EPOS, under the aegis of SCC and EC a policy group - working as necessary with other stakeholders - initiates, develops and documents policy for approval, and then oversees the implementation through IT.

This group is currently working on (a) the policies; (b) the guidelines based on those policies for each policy area; (c) the implementation of the policies through IT support especially using AAAI (Authentication, Authorisation, Accounting infrastructure) and the metadata catalog with supporting software processes.

The policy areas covered are:
- Asset Provision including curation and provenance, covering data, data products, software, documentation, publications

- Asset Access including curation and provenance, covering data, data products, software, documentation, publications)
- Personal Data Protection including GDPR
- Security including privacy and authorisation
- Responsible Research and Innovation including ethics, governance, societal engagement, gender equality, open access to science, science education

The guidelines – for each area as defined in Sections 2 and 3 - for enacting the policies are shown in (Figure 2) and for the first guideline (asset provision) an indication of what is covered is provided by the 'cloud' elements of the diagram. Each Guideline area has relationships to multiple policies. As indicated in (Figure 1) the IT support of the policies is through 'building blocks' within a framework of AAAI and metadata catalog.
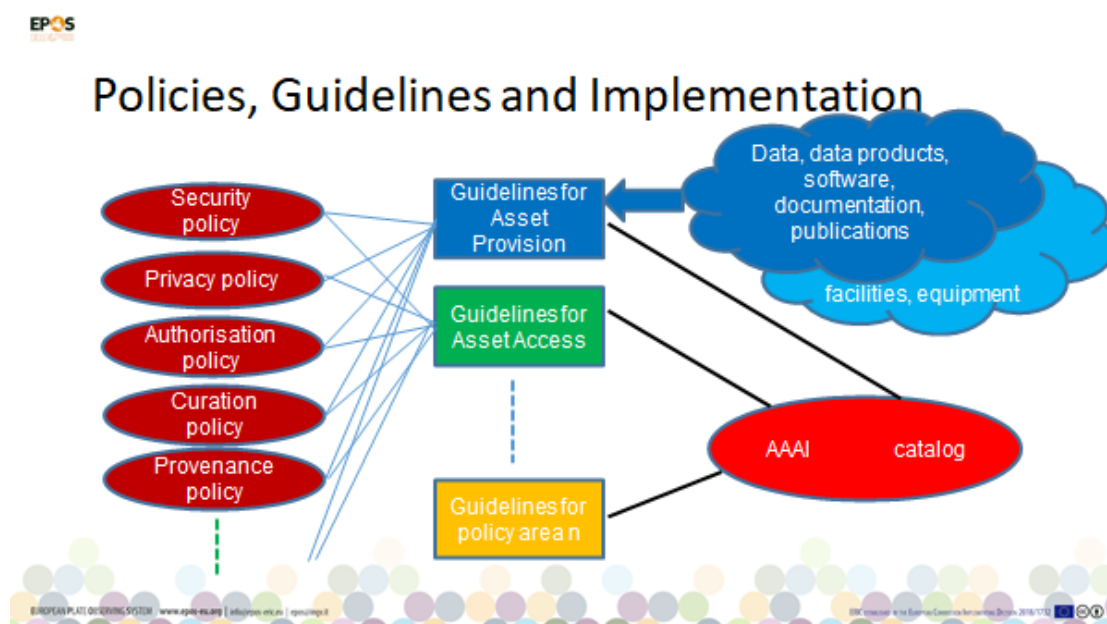

Figure 2: Policies, Guidelines and Implementation

6 Conclusions

Work on policy and governance is continuous as circumstances change. EPOS had set up a set of initial policies and governance. The current governance structure of EPOS-ERIC remains, but a new Policy Group has been set up to ensure EPOS has appropriate policies with governance and IT support that is commensurate.

7 Impact on the project

The existing EPOS policies and governance may provide information for comparison with other similar organisations. The new Policy Group of EPOS has already initiated interaction with WP4 (Policy) in ENVRI-FAIR and will ensure considerations concerning ENVRI-FAIR and EOSC are taken into account in EPOS policy formulation.

8 Impact on stakeholders

This deliverable reports the work done to date in EPOS on policies and governance. While the existing policies and governance may be of interest to many stakeholders, the work of the new Policy Group provides an opportunity for further, more fruitful interaction.

Clearly, the outcome of EPOS policies and governance will be a better managed system providing benefit to the European geoscience community, through ENVRI-FAIR and the ENVRI community to other areas of environmental science, and through EOSC even wider.

9   References

See footnotes

10 ANNEX A GLOSSARY

ACRONYM	MEANING
AAAI	Authentication, Authorisation, Accounting Infrastructure
AARC	Authentication and Authorisation for Research Collaborations (a series of EC-funded projects)
CERIF	Common European Research Information Format (an EU Recommendation to Member States)
DMP	Data Management Plan
EC	European Commission
ECO	EPOS Coordination Office
EOSC	European Open Science Cloud
EPOS	European Plate Observing System
EPOS-DCAT-AP	An application profile (AP) of DCAT (Data Catalog Vocabulary) for EPOS
EPOS-ERIC	European Research Infrastructure Consortium for EPOS
FAIR	Findable, Accessible, Interoperable, Reusable
GA	General Assembly
GDPR	General Data Protection Regulation
GEANT	The European network connecting National Research and Education Networks
HO	Hosting Organisations (of EPOS)
ICS	Integrated Core Services (of EPOS)
IT	Information Technology
ITB	IT Board (of EPOS)
KPI	Key Performance Indicators
QA	Quality Assurance
RDA	Research Data Alliance
RI	Research Infrastructure
RRI	Responsible Research and Innovation
SCC	Services Coordination Committee (of EPOS)
TCS	Thematic Core Services (of EPOS)
TNA	Trans-National Access

11 ANNEX 1 EPOS Data Policy

The EPOS data policy implies open, usually toll-free access to data, a clear data management plan, and respect for the widely accepted/general/national/international conventions and standards.
The EPOS Data Management Plan (DMP) is based on the "FAIR" principles: Findable, Accessible, Interoperable and Re-usable).

The original EPOS DATA POLICY document can be found at this link: https://gnss-metadata.eu/Guidelines/EPOS-Data_Policy.pdf

For readers' convenience, we only report the Table of Contents in this context.

12 ANNEX 2 EPOS Description (including policies and governance)

Legal framework

Governing EPOS

The European Research Infrastructure Consortium (ERIC) has been chosen by the Board of Governmental Representatives (BGR) as the legal model for EPOS and used in designing the Governance Model. The Governance Model includes a General Assembly of members and an Executive Director, supported by an Executive and Coordination Office (ECO). A Services Coordination Board representing the Thematic Core Services and the Integrated Core Services will inform and assist the Executive Director in formulating and executing the EPOS work programme. The ECO is the EPOS Headquarter and the legal seat of the distributed infrastructure governing the construction and operation of the Integrated Core Services and coordinating the implementation of the Thematic Core Services. The BGR, on the basis of an international competition, has decided the legal seat of EPOS will be hosted in Italy at the Rome headquarter of the Istituto di Geofisica e Vulcanologia.
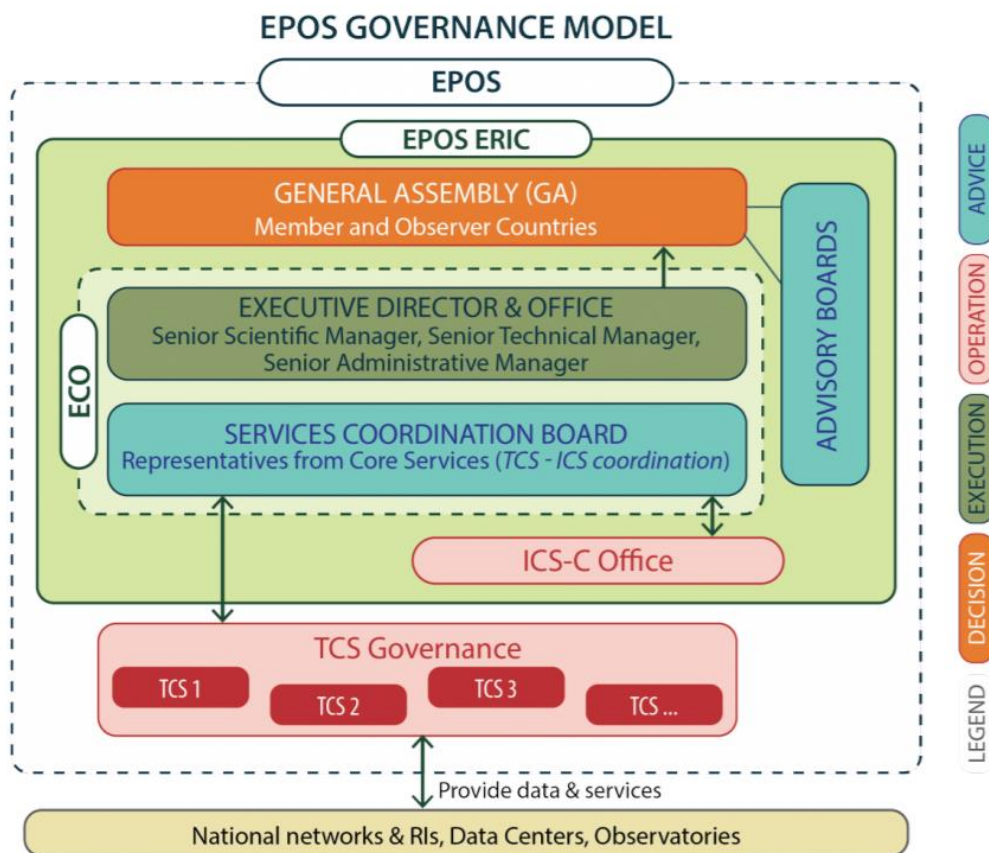
Data Policy and Access Rules

Having in mind that DATA are more useful if they can be accessed, aggregated and re-used, EPOS aims to provide interdisciplinary services to researchers interested in geoscience, including access to data, metadata, data products, software, IT tools, and also to computational resources for visualization and processing as well as to research facilities (e.g., laboratories, volcano observatories).

EPOS will provide fully open and easy access to homogeneous high-quality DATA and services from many solid Earth science disciplines such as seismology, volcanology, geodesy, and geology. This is considered essential to enable research and innovation to flourish and to allow Europe's ability to enhance its economic performance and improve its capacity to compete through knowledge.

In order for services and DATA to flow "seamlessly", EPOS ERIC must delicately balance the needs of Suppliers of data and services, whether they are researchers, national institutes or other bodies or infrastructures, against the requirements of Users.

EPOS will implement an efficient DATA management plan for the needs of the Users and, at the same time, ensure that the Supplier's interests are protected (e.g., throughout appropriate acknowledgement or citation). To ensure that the EPOS ERIC supports such a seamless flow of data and services, a legal

policy framework will be put in place in order that the global research community appreciates and understands the rules and policies surrounding data and services access, use, and dissemination. In its policy, EPOS-ERIC intends to adopt the following key principles: to disseminate data and knowledge through Open Access; to provide a multidisciplinary data management plan to foster a community building for solid Earth Sciences through shared access policies and rules; to make DATA and facilities available in a timely manner, without undue delay and preferably free of charge taking in due account the need to differentiate between access to DATA and access to facilities; to use terms and definitions which are consistent with Article 2 of the Convention establishing the World Intellectual Property Organisation (WIPO) signed on 14 July 1967; to create internal intellectual property rules between EPOS Partners which will be approved by the EPOS-ERIC General Assembly; to comply with all relevant European and International legislation on data and IPR protection including the INSPIRE regulations; to follow the OECD principles for research data from public funding; to utilize a widely accepted community licensing schema, e.g. Creative Commons.