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ABOUT

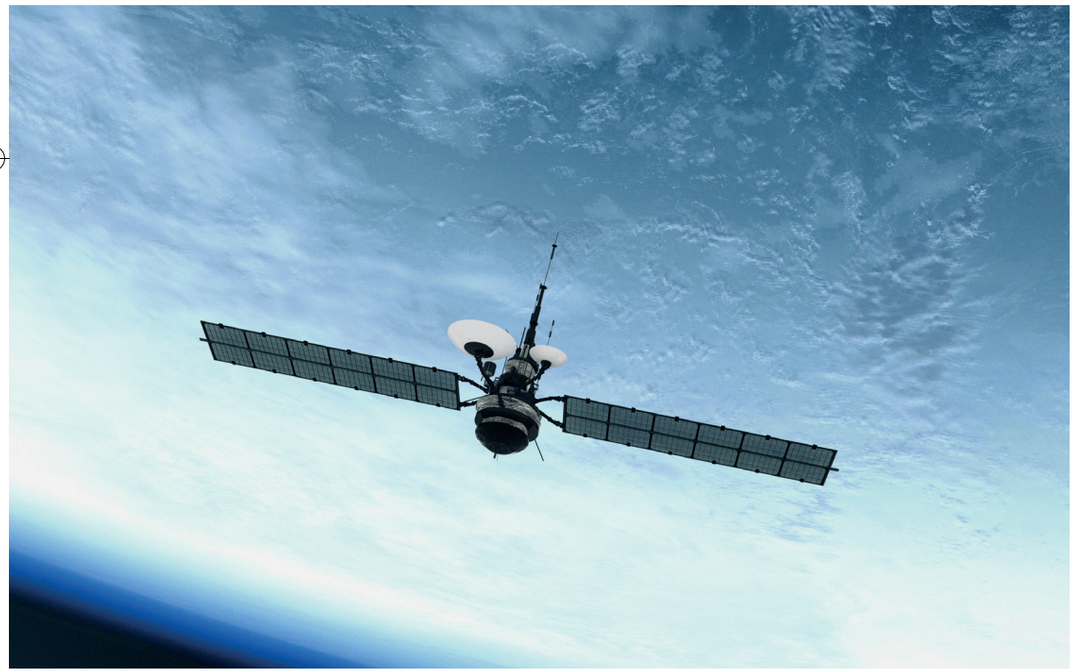
EPOS, the **European Plate Observing System**, is Europe's research infrastructure dedicated to **integrating data**, **tools**, **and services** from the solid Earth sciences. It provides seamless access to **multidisciplinary scientific resources**, enabling researchers to study geodynamic processes such as earthquakes, volcanic eruptions, tsunamis, and tectonic activity.

EPOS is built on a **federated architecture** that connects national and transnational research infrastructures using shared standards for data and metadata ensuring consistency, interoperability, and long-term sustainability.

As strong practitioners of Open Science, EPOS promotes **open and universal access** to high-quality, harmonized data and services, enabling scientists to tackle complex societal challenges and drive innovation in **hazard assessment** and **sustainable stewardship of georesources**. EPOS ensures that transparent research data and services are freely accessible, reusable, and impactful for the scientific community and society at large.

Uniting **scientists**, **technology experts**, and **policymakers** around reliable access to high-quality data delineates EPOS' long-term sustainability in solid Earth science research.

VISION, MISSION, AND VALUES



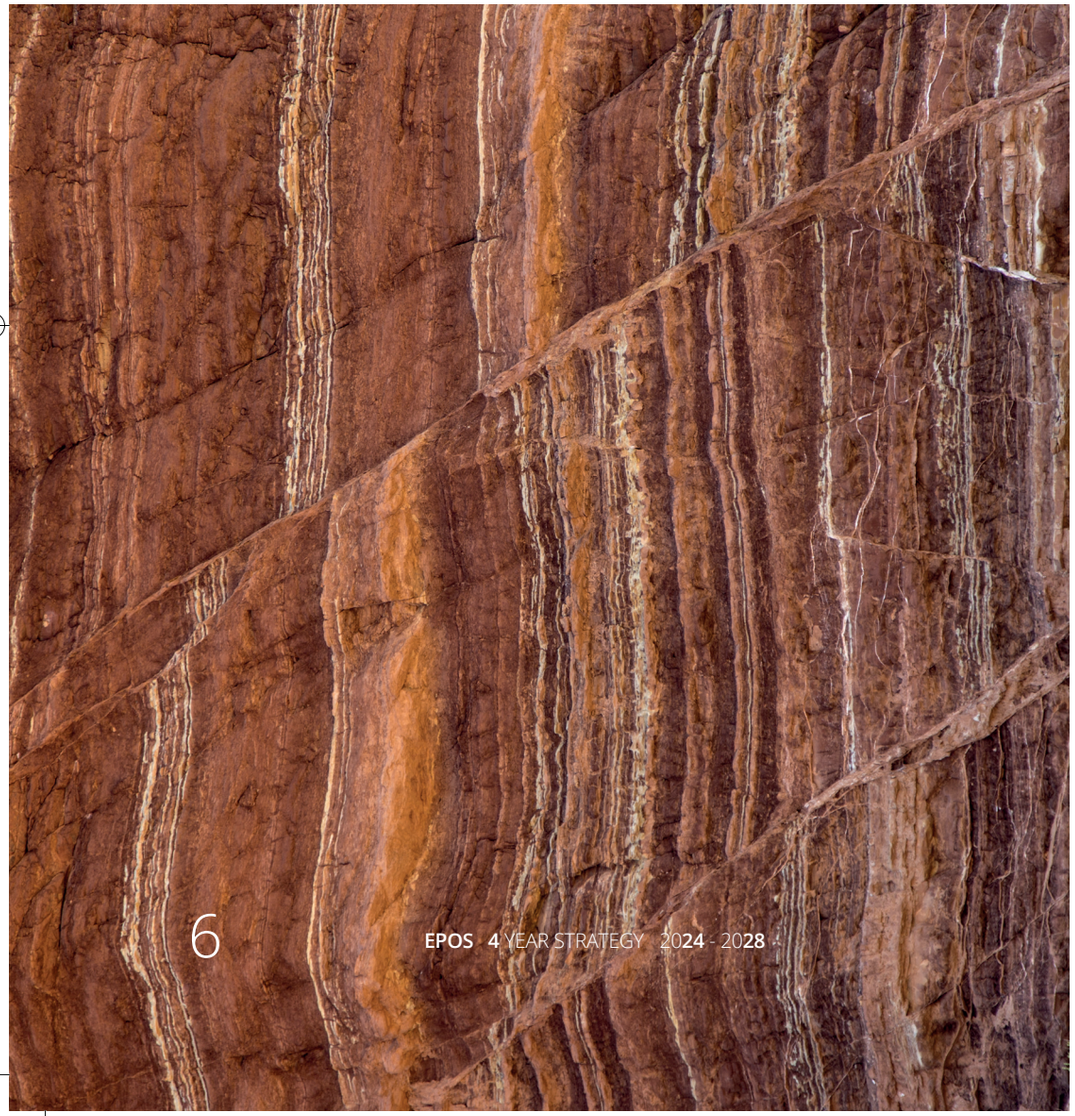
EPOS' vision is to ensure the sustainable and universal use and reuse of multidisciplinary solid Earth science data and products. This will **foster excellent science and innovation** while contributing to the better understanding of Earth processes.

EPOS' mission is to provide **sustainable and long-term access** to solid Earth science data and services by integrating diverse European Research Infrastructures under a **common federated framework**.

Every initiative pursued by EPOS aligns with its vision and mission and is rooted in the values of **quality**, **integrity**, **openness**, **inclusiveness**, **equity**, and **responsibility**. EPOS upholds **open research and collaboration** across scientific, governmental, and industrial sectors while emphasizing ethical considerations and regards **FAIR data principles** as fundamental to its mission and a direct outcome of its values.

The ambition is **to expand disciplinary boundaries** while **addressing critical societal challenges**, such as climate change, natural hazards, and sustainable use of georesources.

CONTEXT



EPOS contributes to scientific advancement and societal resilience by providing essential data for the analysis and modeling of Earth processes which are critical in areas like hazard assessment, disaster management, and sustainable use of georesources.

The EPOS infrastructure is built on two core components: **Thematic Core Services** (**TCS**) and **Integrated Core Services** (**ICS**).
TCS are **self-governed thematic communities** which organize their data, tools, and services to address specific scientific challenges while ensuring FAIR and responsible data management. As of today, EPOS includes 10 TCS: Anthropogenic Hazards, Geological Information and Modeling, Geomagnetic Observations, GNSS Data and Products, Multi-Scale Laboratories, Near-Fault Observatories, Satellite Data, Seismology, Tsunami, and Volcano Observations.
The ICS is the central system that integrates all TCS data and tools into a **single platform**, offering computing resources and enabling **seamless cross-discipline collaboration**.

By connecting diverse data sources EPOS addresses the demand for scientific tools including better climate models and deeper analytics of seismic and volcanic activity, which results in better outcomes in areas such as comprehensive environmental planning. Moreover, EPOS fosters **collaboration between academic**, **governmental**, and **industrial sectors** ensuring data-driven decision-making and contributing to sustainable growth and economic development.

CHALLENGES AND GOALS

The major challenges facing EPOS lie in **operating a sustainable and resilient research infrastructure** in the rapidly evolving domain of solid Earth sciences. EPOS must integrate a diverse array of scientific data and meet increasing societal demands for more refined research into the Earth's processes, particularly in the face of climate change and natural hazard management.

A critical factor lies in **aligning national research infrastructures** with the overarching goals of transnational cooperation and data sharing.

EPOS Strategic Objectives are to:

#1 Ensure smooth and **seamless access** to solid Earth science data and services.
#2 Enhance and advance **services** for solid Earth science.
#3 Enlarge, widen and empower the **user community**.
#4 Implement **Open Science and FAIR data management** principles and contribute to e-science innovation.
#5 Amplify and spread the **societal value** of EPOS.
#6 Boost **global cooperation**.

#1

Ensuring smooth and seamless access to solid Earth science data and services

EPOS aims to establish itself as a leading research infrastructure by delivering seamless, reliable access to scientific data, products and services from multiple data sources across solid Earth science domains. Central to this objective is the **EPOS Platform** which transparently integrates resources through a robust ICS-TCS interface. Sustained through effective governance and collaboration, the EPOS Platform provides a **user-focused Europe-wide portfolio** for multidisciplinary solid Earth science communities.

Action Items:

- **Operate the EPOS Platform** through the Integrated Core Services Central hub (ICS-C).
- **Integrate TCS data and services** through the ICS-TCS system.
- **Consolidate TCS governance** and coordination to ensure long-term service provision.
- Strengthen collaboration with **data providers** and National Research Infrastructures.

#2

Enhancing and advancing services for solid Earth science

To remain at the forefront of scientific innovation, EPOS strives to upscale the Platform's functionalities and **develop its service portfolio**. Based on the feedback received from the community and technological innovation, existing services are constantly improved while new ones are being integrated, including visualization, processing, and AI-driven scientific tools. By **responding to user feedback** and research developments, EPOS ensures its portfolio meets the evolving needs of Europe's solid Earth science community.

Action Items:

- Continuously **enhance the EPOS portfolio** by integrating new and improving existing services.
- Enhance the EPOS Platform's functionality based on **user feedback**.
- Identify and engage **emerging thematic communities**.
- Finalize the framework for **trans-national access** in EPOS.
- Implement distributed **multi-purpose platforms** (ICS-D) for data visualization, processing, and virtual research environments.
- Prepare the EPOS research infrastructure for the growing demand **for AI applications**.

#3

Enlarging, widening and empowering the user community

EPOS is committed to building a **diverse and engaged community** to maximize the impact of its research infrastructure and to adapt to their evolving requirements. To this aim, EPOS strives to create a **two-way communication** channel with researchers at all career stages, industry professionals, and disaster risk managers while addressing access barriers, providing focussed **training** and fostering communication. Interaction and feedback ensure an inclusive environment that amplifies service use and recognition.

Action Items:

- **Identify potential user groups** and develop targeted interaction frameworks.
- **Address barriers** hindering the widespread use of EPOS data and services.
- Develop **tailored strategies** for diverse user groups including early-career researchers and private sector stakeholders.
- Promote EPOS through **"ambassadors"** and increase recognition of its services.
- Provide comprehensive **training programs** for both trainers and users.

#4

Implementing Open Science and FAIR data management principles and contributing to e-science innovation

EPOS champions **Open Science and FAIR data management** principles to ensure transparent and equitable access to data, scientific products and services. Efforts towards this objective encompass open source tools, open access to research outputs, and advancements in digital infrastructures like **Digital Twins** and **Cloud Computing**. By fostering interoperability and contributing to European Open Science Cloud (EOSC) initiatives, EPOS highlights exemplary data science practices.

Action Items:

- Implement **FAIR principles**, **open licenses**, and promote **open access** for EPOS-based research.
- Promote the dissemination of EPOS-based research in **open access publications**.
- Release the EPOS Platform code and tools as **open source** packages.
- Disseminate the EPOS Data Policy to **encourage FAIR practices** across the community.
- Develop **attribution and provenance** tracking solutions within the ICS-TCS framework.
- Advance EPOS' roadmap for **Cloud Computing**, **Machine Learning**, and **Collaborative Virtual Environments**.
- Define strategies for EPOS' participation and contribution to **EOSC**, European Data Space, and Destination Earth.

#5

Amplifying and spreading the societal value of EPOS

EPOS aims to translate its scientific advancements into **tangible societal benefits** and to contribute to the addressing of critical challenges like climate change, hazard assessment, and the sustainable stewardship of georesources. The integration of expansive geographical data can be pivotal for refining urban planning strategies and the design of large-scale infrastructures, contributing to geohazard mitigation and potentially safeguarding essential lifelines. **Collaboration with civil protection agencies**, **industry**, **and policymakers** ensures that EPOS supports informed decision-making and innovation. By integrating **ethical and environmental considerations** into its operations, EPOS strengthens its commitment to societal impact and sustainability.

Action Items:

- Expand the EPOS service portfolio to support trans-disciplinary research in **hazard assessment**, **sustainable stewardship of georesources**, and **climate change**.
- Foster innovation and **dialogue with stakeholders**, including civil protection and private sector representatives..
- Implement EPOS **Ethical Guidelines** and develop a comprehensive code to describe the ethical implications of EPOS services.
- Promote the **societal value** of EPOS infrastructure through targeted communication.
- Evaluate and mitigate the **environmental impact** of EPOS operations.

#6

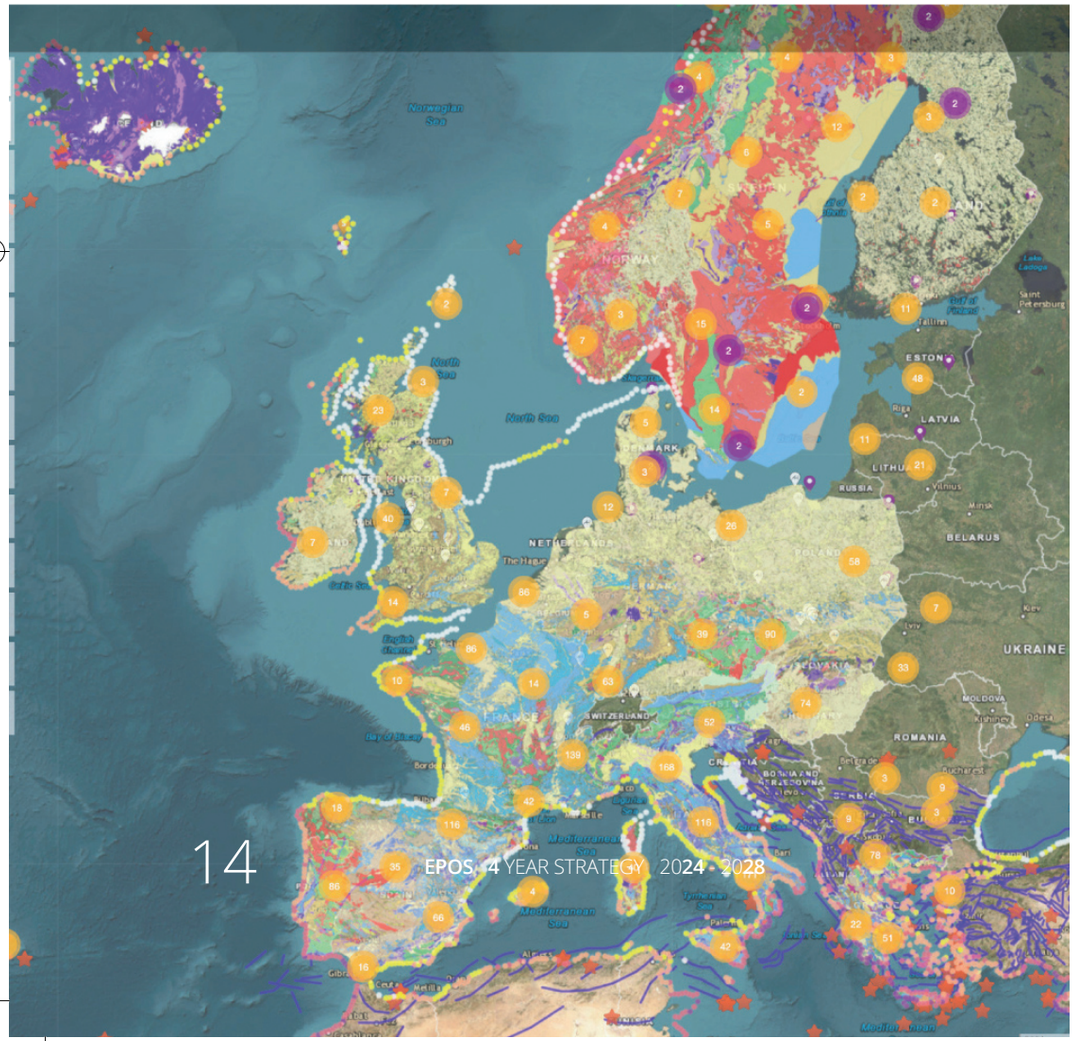
Boosting global cooperation

EPOS seeks to strengthen its global presence and impact by collaborating with **international research infrastructures and initiatives** for solid Earth science. Partnerships across regions such as **Africa**, **Latin America**, the **USA**, and **Oceania**, as well as contributions to **European Environmental Research Infrastructures** (ENVRI), underscore EPOS' commitment to global scientific collaboration. These efforts aim to promote FAIR Research Data Management practices and Open Science at a global level while establishing EPOS as a leader in the international geosciences community.

Action Items:

- Sustain and expand collaborations within the **ESFRI framework** and the **ENVRI community**.
- Expand **partnerships with international research infrastructures** for solid Earth science in diverse world regions.
- Promote Open Science and **global data science collaboration**, thus advancing the broader scientific community's access to knowledge

EPOS PLATFORM



EPOS' data strategy centres around the FAIR principles, ensuring that all data are **Findable**, **Accessible**, **Interoperable**, and **Reusable**.
The EPOS Platform is a critical tool for achieving this, offering **access to standardized and integrated datasets** from diverse sources.
This Platform facilitates research **across multiple disciplines**, helping users analyse complex Earth systems.

EPOS relies on **National Research Infrastructures** (**NRIs**) and **Thematic Core Services** (**TCS**) to make FAIR, reliable and up-to-date data and services available. Its **distributed architecture** underpins the Platform's capacity to foster multidisciplinary research and drive scientific excellence.

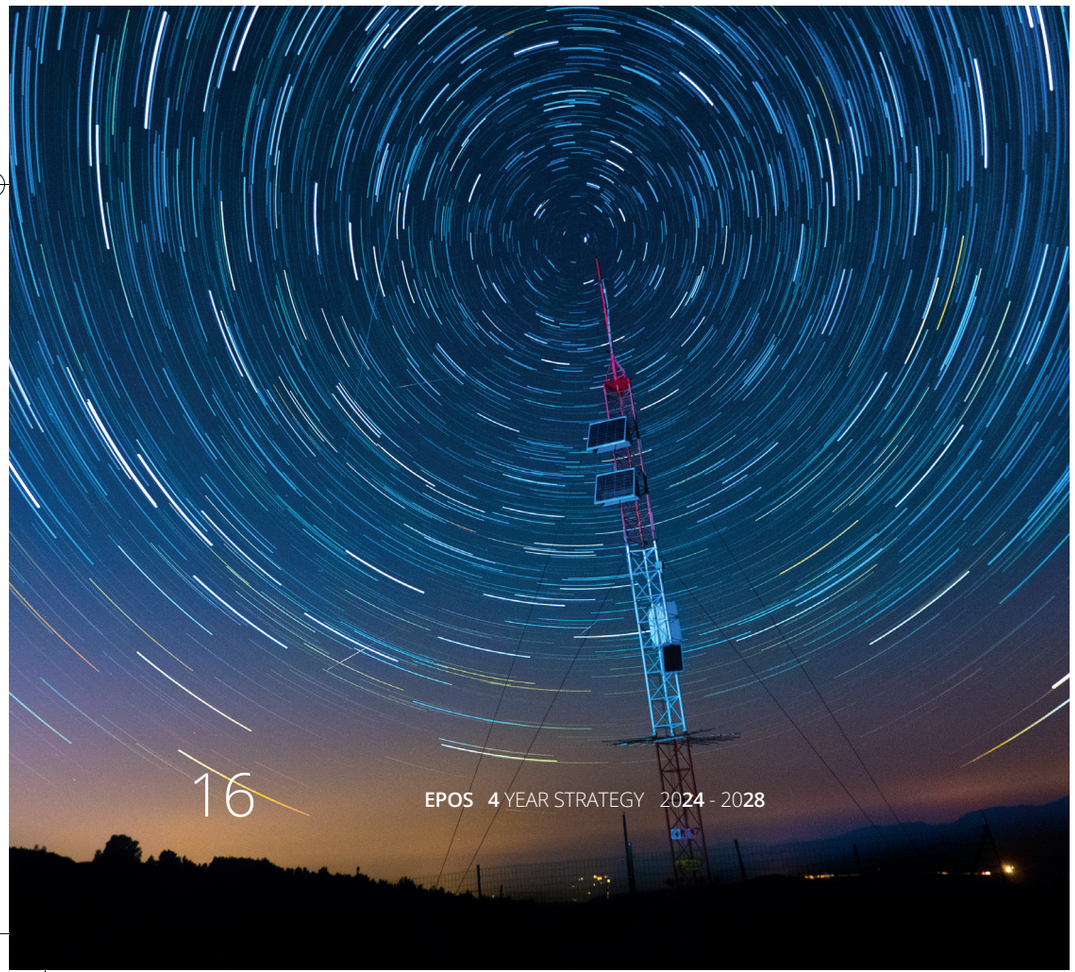
IMPACT

EPOS contributes to scientific advancements by providing essential data for the analysis and modelling of Earth processes, which are critical for **hazard assessment** and **environmental management**. EPOS also facilitates innovation in **disaster management**, **urban planning**, and the **sustainable exploration and exploitation of georesources**, thus contributing to prevention and mitigation of natural and anthropogenic **geohazards**.

The integration of diverse data sources helps to address societal demands for more accurate climate models, better understanding of seismic and volcanic activity, and comprehensive urban and environmental planning.

EPOS is pivotal in fostering collaboration between academic, governmental, and industrial sectors, ensuring **data-driven decision-making** and contributing to sustainable growth, economic development, and societal resilience against natural disasters.

COMMUNITY AND COLLABORATION



EPOS' success hinges on its ability to build **a strong**, **engaged community** that spans the globe. EPOS serves various stakeholders including scientists, IT experts, national governments, private sector and the general public. Engagement initiatives, such as **training programs** and **collaborative platforms**, help to foster dialogue between these diverse groups, ensuring that EPOS research infrastructure meets their needs.

On a **global level**, EPOS has formed collaborations with research infrastructures in **Europe**, the **USA**, **Australia**, and **New Zealand**. These partnerships enhance EPOS' ability to provide global data access and to contribute to international Earth science research efforts. The ambition is to extend this vision to all continents, forging new collaborations with relevant research infrastructures and initiatives in other world regions.

By fostering this international community, EPOS helps to **shape global scientific practices and policies**.

GLOSSARY

Digital Twin

Virtual model of a physical object, process, or system, updated in real-time with data. It enables monitoring, simulation, and optimization by mirroring its physical counterpart.

ENVRI (**European Environmental Research Infrastructures**)

A cluster of environmental research infrastructures in Europe, enabling interdisciplinary collaboration and providing data, tools, and services for studying and addressing environmental challenges.

EOSC (**European Open Science Cloud**)

A pan-European initiative that provides a federated, open, and secure environment for researchers to store, share, and access data, tools, and services across disciplines and countries.

ERIC (**European Research Infrastructure Consortium**)

A legal framework established by the EU to facilitate the creation and operation of large-scale research infrastructures, enabling countries to collaborate and provide shared access to resources, data, and expertise across Europe.

>>>

ESFRI (**European Strategy Forum on Research Infrastructures**)
A strategic body that develops policies and priorities for the development, integration, and sustainability of world-class research infrastructures in Europe.

FAIR Data Principles
Guidelines to ensure that data are Findable, Accessible, Interoperable, and Reusable.

ICS (**Integrated Core Services**)
EPOS' core e-infrastructure that integrates data and services from various research infrastructures.

ICS-C (**Integrated Core Services-Central Hub System**)
Where integration of data, data products and services occurs.

ICS-D (**Integrated Core Services-Distributed**)
Virtual extension of the ICS-C with additional computing facilities to support workflows, processing or visualization functionalities.

ICS-TCS system/framework
The interface between ICS and TCS within EPOS which ensures seamless interaction and data integration.

NRI (**National Research Infrastructure**)
National research institutions which contribute data and services to EPOS.

TCS (**Thematic Core Services**)
Domain-specific services within EPOS that ensure community-specific data integration and delivery.

ACKNOWLEDGEMENTS

This publication, authored by the EPOS ERIC Executive Director and the EPOS ERIC Executive Coordination Office, summarizes key elements of the EPOS Strategy 2024–2028, a comprehensive internal document adopted by the General Assembly in 2024, outlining our goals and outlook for the coming years. The strategy was developed with the active engagement and collaboration of the EPOS Community, reflecting our shared vision and collective efforts.

Design and layout: Barbara Angioni

EPOS
EUROPEANPLATEOBSERVINGSYSTEM