



Building a shared EPOS Science Program

EPOS SP Annual Meeting | 22-23 June 2022

Otto Lange

outline

- Understanding the role and scope of the EPOS Science Program
- Scientific Perspectives in the EPOS Delivery Framework
- Translation into sustainability measures
- Next steps

A (very) brief history

- EPOS White Paper (2017) – BNSR
- Draft Science Plan (2021) – Kuvvet Atakan (shared with GA/SB)

A matter of connotation

A few observations and constraints

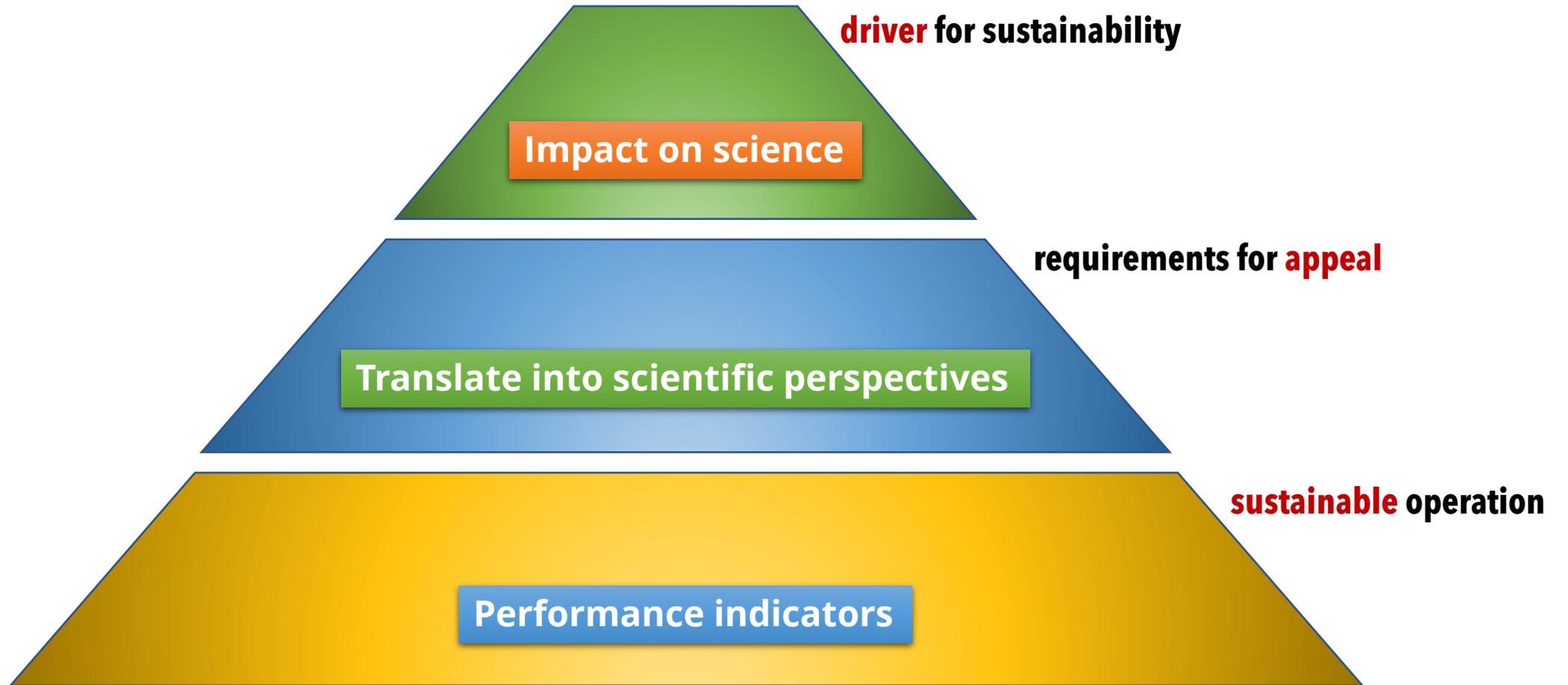
- EPOS is not a research organization (it is a RI!)
- Research organizations connect via the EPOS framework
- The (main) goal of EPOS is to facilitate impact on science through the **sustainable** provision of access to data, data products, etc.
 - Conducting scientific research is NOT part of the strategic activities of the EPOS RI
 - However, facilitating scientific impact is core to the EPOS mission

The necessity of an EPOS Science Program

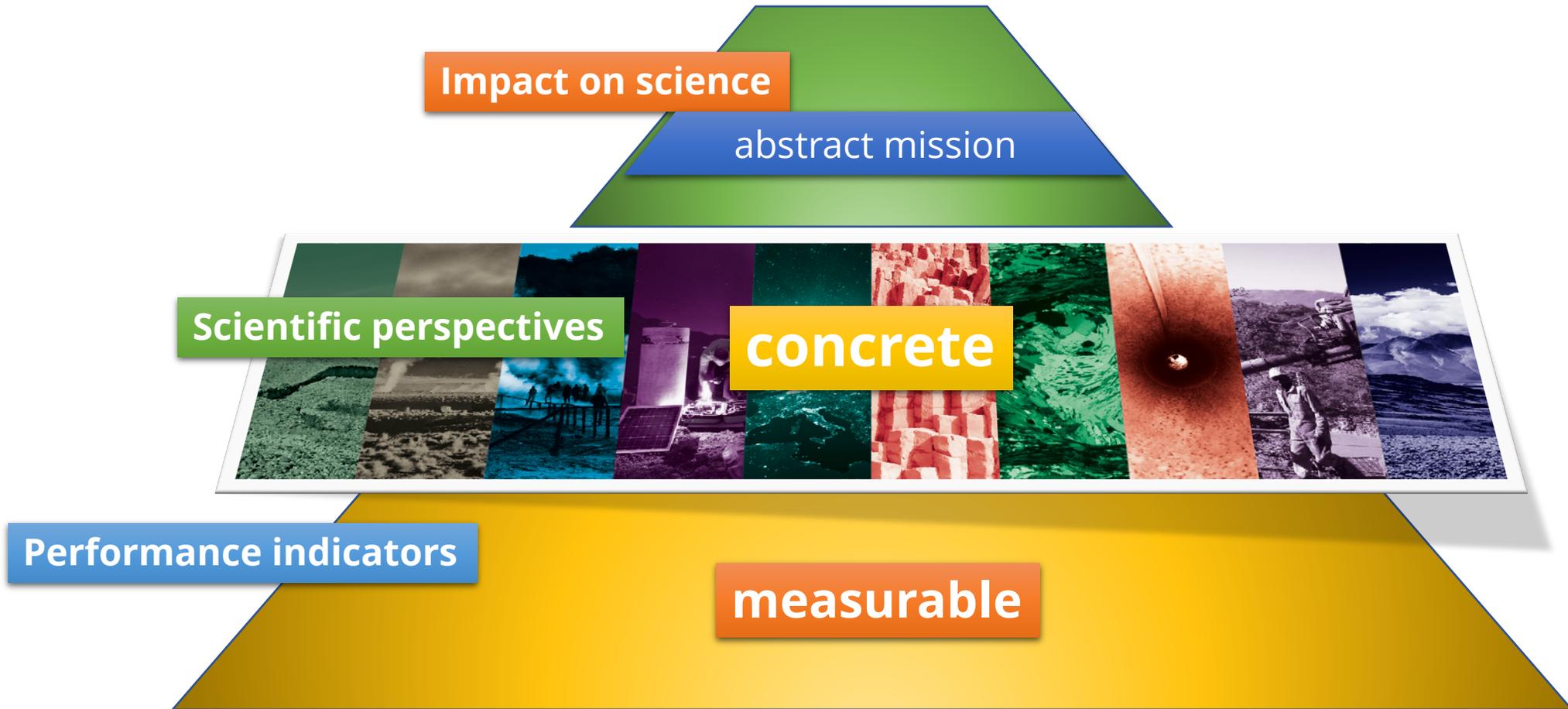
Why should a research infrastructure (like EPOS) have a *science program*?

- EPOS was established to **support scientific research** in the solid Earth sciences (SES)
- More specifically: the EPOS *science case* is aimed at **facilitating impact on science**
- A **science program** is necessary to identify the requirements that must be met for this science case to **remain appealing** to the user community and its stakeholders
- Indeed, the most important driver for the sustainability for EPOS is **facilitating impact on science**

The scope of the EPOS Science Program

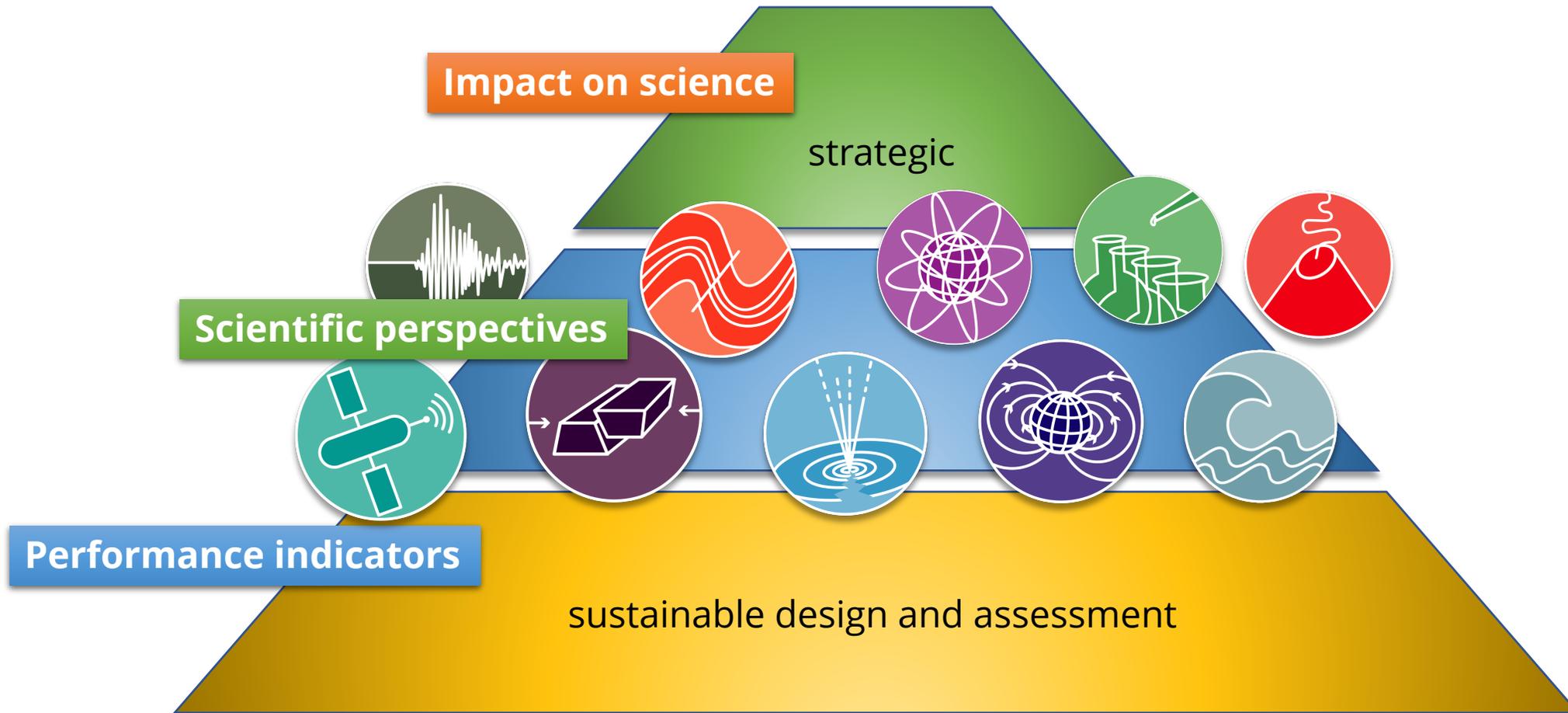


The scope of the EPOS Science Program



5 years ('23-'28) – from mission to proven impact

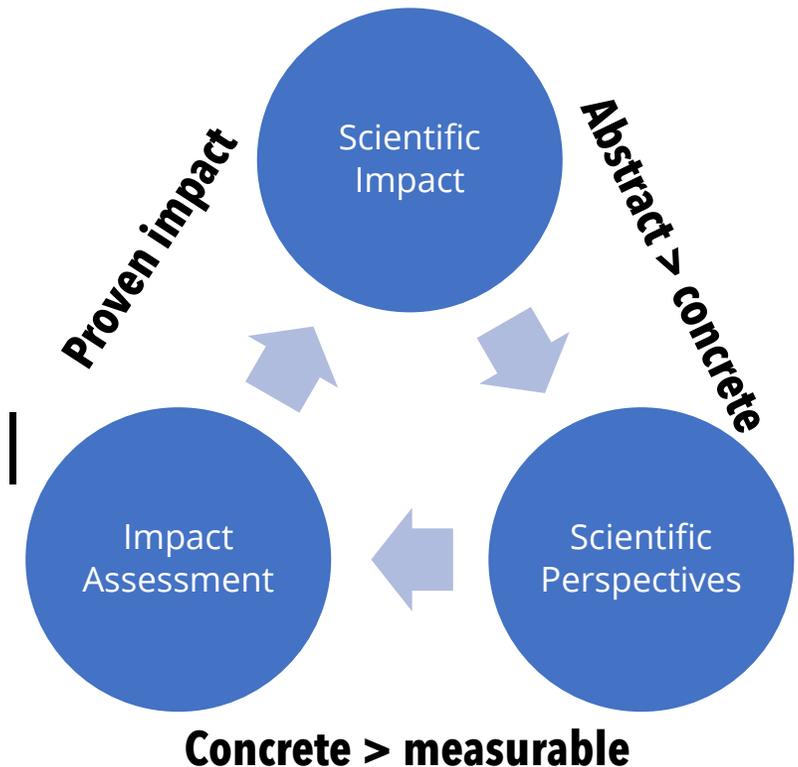
The scope of the EPOS Science Program



The scope of the EPOS Science Program

The EPOS Science Program is a key document that encompasses

- ❑ The overarching goal
- ❑ The concrete implementation of the goal
- ❑ The strategy to assess that the implementation meets the goal

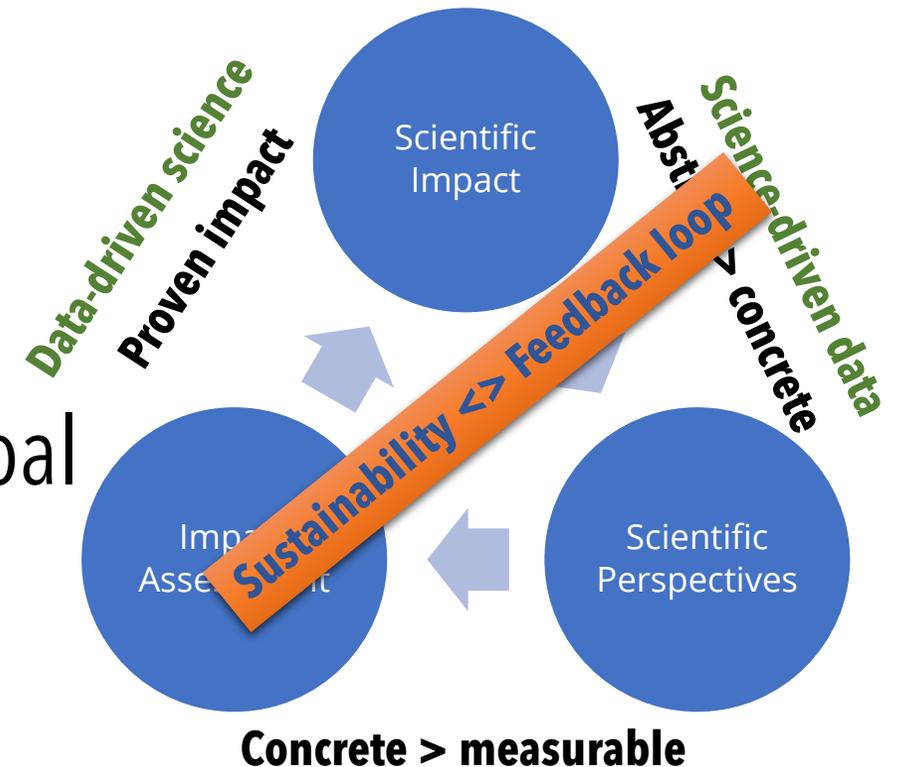


Therefore, it is a single document that allows one to understand how and why EPOS actually works for the next 5 years.

The scope of the EPOS Science Program

The EPOS Science Program is a key document that encompasses

- ❑ The overarching goal
- ❑ The concrete implementation of the goal
- ❑ The strategy to assess that the implementation meets the goal



Therefore, it is a single document that allows one to understand how and why EPOS actually works for the next 5 years.

Facilitating impact on science: towards an EPOS Vision

Translation into concrete *perspectives*, a **few examples**:

- Maximizing impact demands acknowledgement of **multidisciplinarity** in SES (e.g., from seismic monitoring and lab experiments to insights into anthropogenic influence)
- Impact on science demands **sustainable access** to data sources
- Facilitating impact requires **harmonization** across sub-disciplines
- Impact can be increased through **sharing (infrastructural) resources** and collaboration
- **Engaging scientific communities** is a prerequisite for both setting up the vision and building the infrastructure

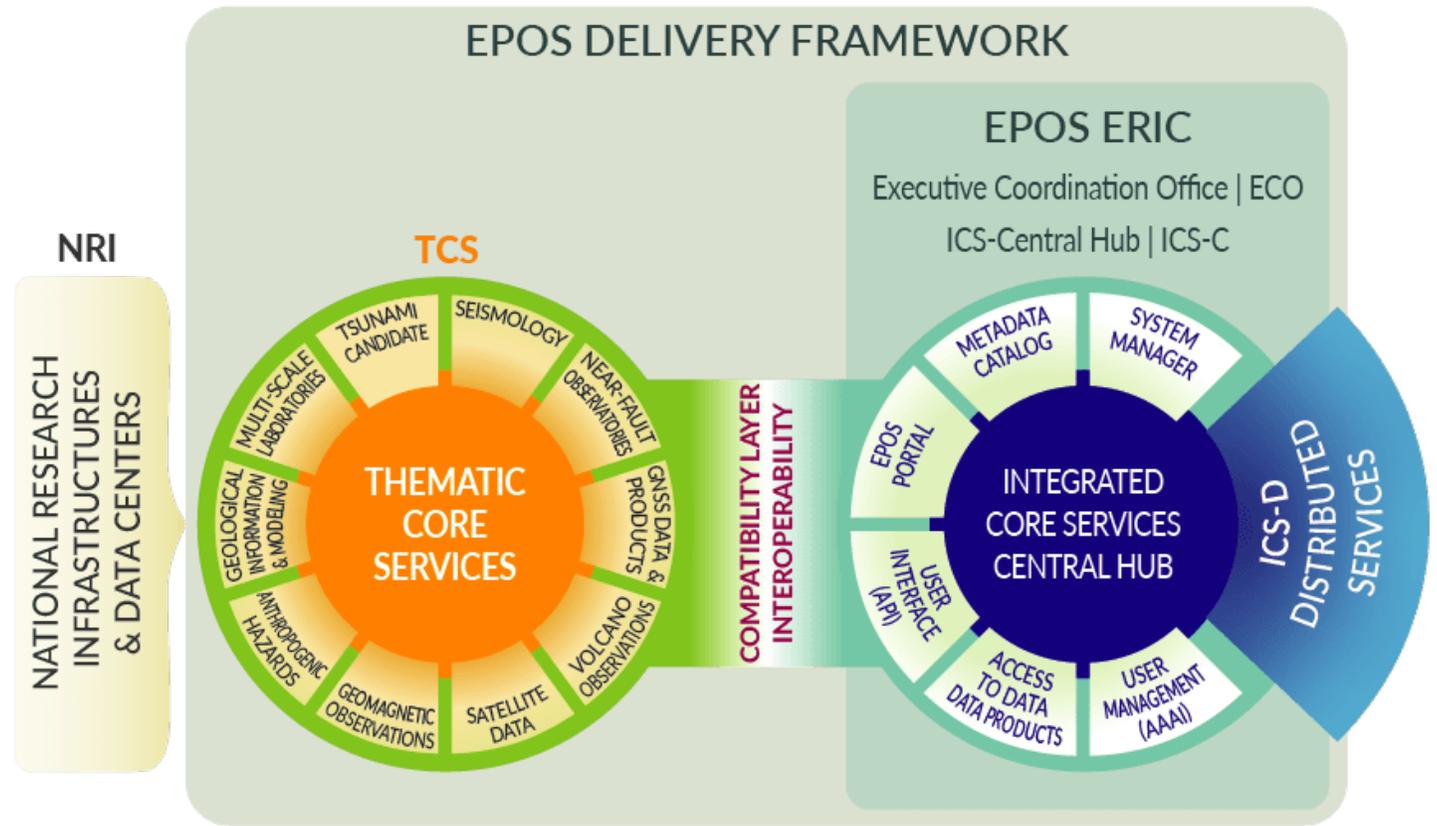
Facilitating impact on science: EPOS concepts

Translation into concrete *perspectives*, a few examples:

- Maximizing impact demands acknowledgement of **multi-disciplinarity** in SES (e.g., from monitoring activities and lab experiments to insights into anthropogenic influence) → **Thematic Core Services (TCS)**
- Impact on science demands **sustainable access** to data sources → **Data, Data Products, Services, and Software (DDSS)**
- Facilitating impact requires **harmonization** across sub-disciplines → **FAIR data management and quality metadata, EPOS vocabulary**
- Impact can be increased through **sharing (infrastructural) resources** and collaboration → **TNA**
- **Engaging scientific communities** is a prerequisite for both setting up the vision and building the infrastructure → **TCS-ICS interactions**

Understanding EPOS as it is

The Science Program motivates EDF as the logical architectural choice for facilitating impact on SES



The Science Program sets out the necessary actions for a sustainable and future-proof operation of the EPOS RI for the next 5 years

Science Program: the EPOS Vision in Scientific Perspectives

- Providing access to solid Earth science data, products, software, and services (DDSS) to enable scientific research and serendipity
- Fostering multidisciplinary use of solid Earth science data (DDSS)
- Enabling cross-disciplinary use of solid Earth science data and products for Earth science
- Contributing to progress in hazard assessment and risk mitigation
- Fostering the implementation of services for society
- Strengthening Computational Earth Science (CES)
- Contributing to IT Innovation and FAIR Data Management
- Strengthening international collaborations and global dimension of research in SES
- Training and dissemination on Solid Earth Science

From perspectives to sustainable implementation

- The EPOS scientific perspectives are (often) easily translated into
 - appropriate sustainability measures
 - measurable impact
 - FAIR data and -services metrics

Examples:

Scientific perspectives and their application

- **Providing access to solid Earth science data, products, software, and services (DDSS) to enable scientific research and serendipity**

- ➔
- 1. Number of DDSS elements entering in operational phase after validation and testing (POT)
 - 2. Number of Services declared in the Cost Book
 - 3. Number of new DDSS made available through ICS-C

- **Fostering multidisciplinary use of solid Earth science data (DDSS)**

- ➔
- 4. Monitoring integrated use of data
 - 5. Access to services for multidisciplinary use of data

- **Enabling cross-disciplinary use of solid Earth science data and products for Earth science**

- ➔
- 6. Data and services shared with ENV RIs
 - 7. Data shared with Space Agencies and EOS

- **Contributing to progress in hazard assessment and risk mitigation**

- ➔
- 8. Data and Services for hazards & Risk
 - 9. Data and Services for Anthropogenic Hazards

Scientific perspectives and their application

- **Fostering the implementation of services for society** →
 - 9. DDSS for forecasting and predictability
 - 10. Early Warning and Alert: test beds and information
- **Strengthening Computational Earth Science (CES)** →
 - 11. Services for CES (ICS-D): access to HPC
 - 12. New products for fast hazard scenarios
 - 13. Engagement in Digital Twins and Digital Earth initiatives
- **Contributing to IT Innovation and FAIR Data Management** →
 - 14. New services for METADATA management
 - 15. Existing plans for FAIR data management
 - 16. Existing (shared) data management plans
- **Strengthening international collaborations and global dimension of research in SES** →
 - 17. Assessing EPOS participation in global initiatives (GEO, ...)
 - 18. New frameworks for TNA
- **Training and dissemination on Solid Earth Science** →
 - 19. Existing Training plan and FAIR training material
 - 20. Communication Plan adopted and implemented

From perspectives to sustainable implementation

- The EPOS scientific perspectives are easily translated into
 - appropriate sustainability measures
 - measurable impact
 - FAIR data and services metrics
- Science program provides a basis for business plan, action plan, and (long-term) sustainability

Contents of the EPOS Science Program (proposal)

Topics:

- EPOS vision on solid Earth science
- Strategic objectives
- EPOS Services and scientific communities
- EPOS Program 2023-2027 (identification of actions)

Roadmap for the EPOS Science Program

- Finalization in a joint effort with communities (SCC, EPOS-SP)
- Delivery at the GA in Dec 2022
- Science program (action points) will cover 2023-2027

Thank you!

Questions?