



Building a shared EPOS Science Program

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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

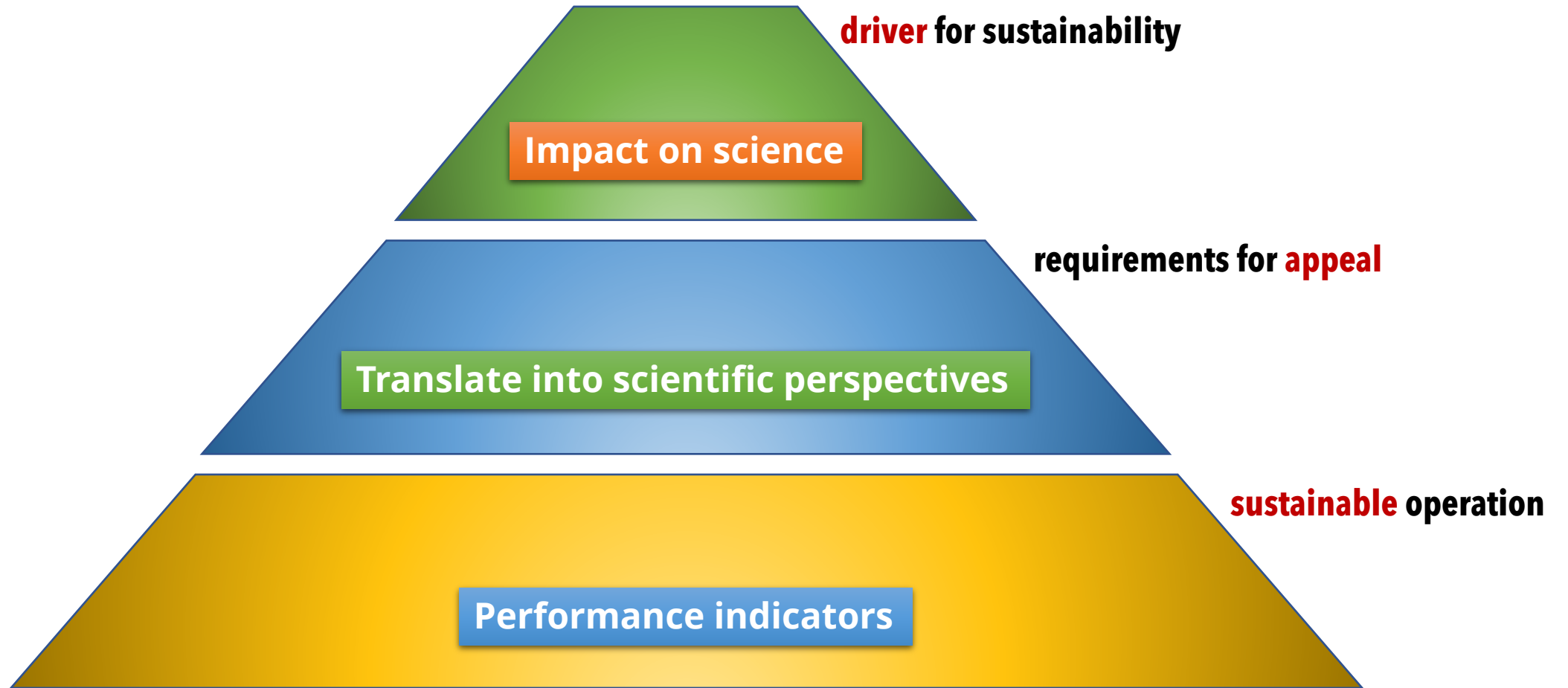
- EPOS is not a research organization (it is a RI!)
- Research organizations connect via the EPOS framework
- The (main) goal of EPOS is to facilitate impact on science through the **sustainable** provision of access to data, data products, etc.
 - Conducting scientific research is NOT part of the strategic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

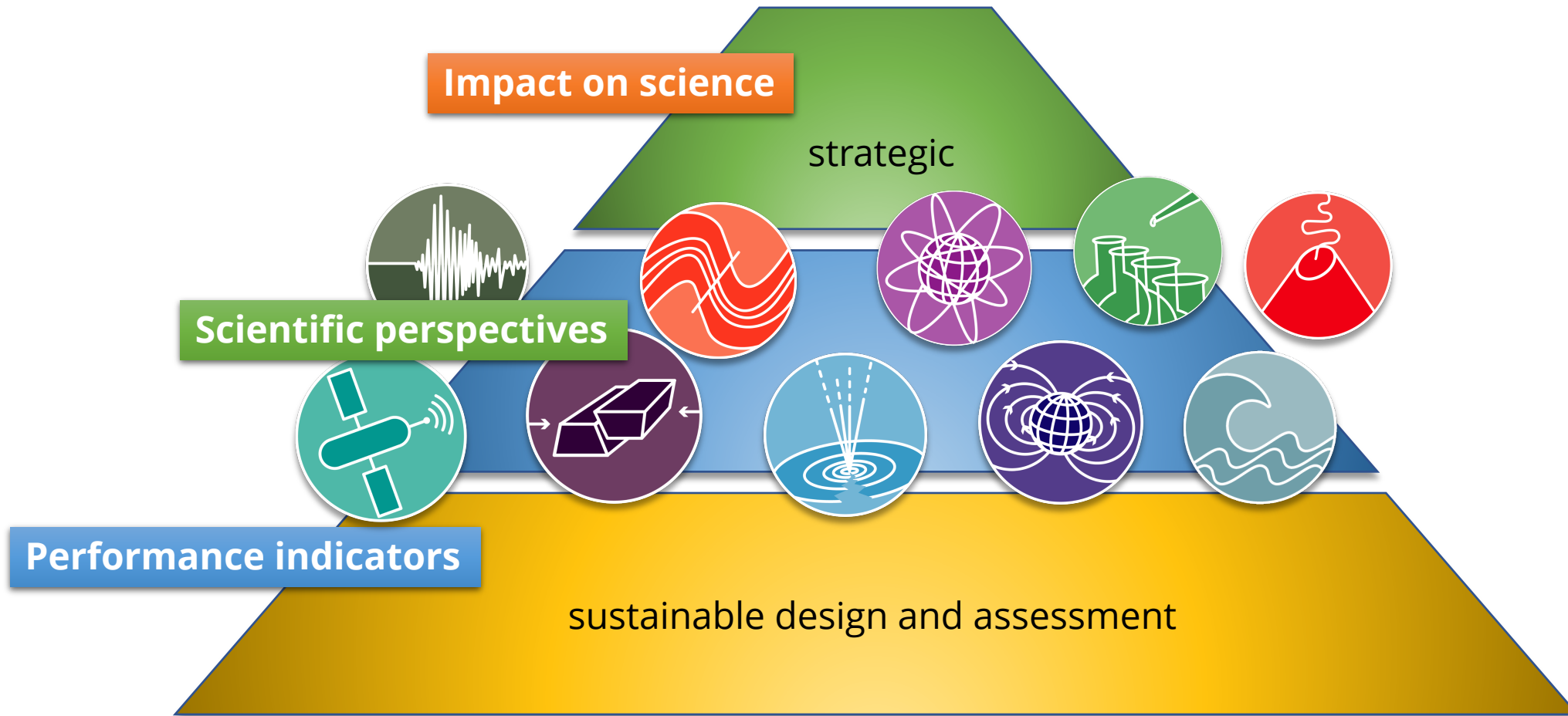
The scope of the EPOS Science Program



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



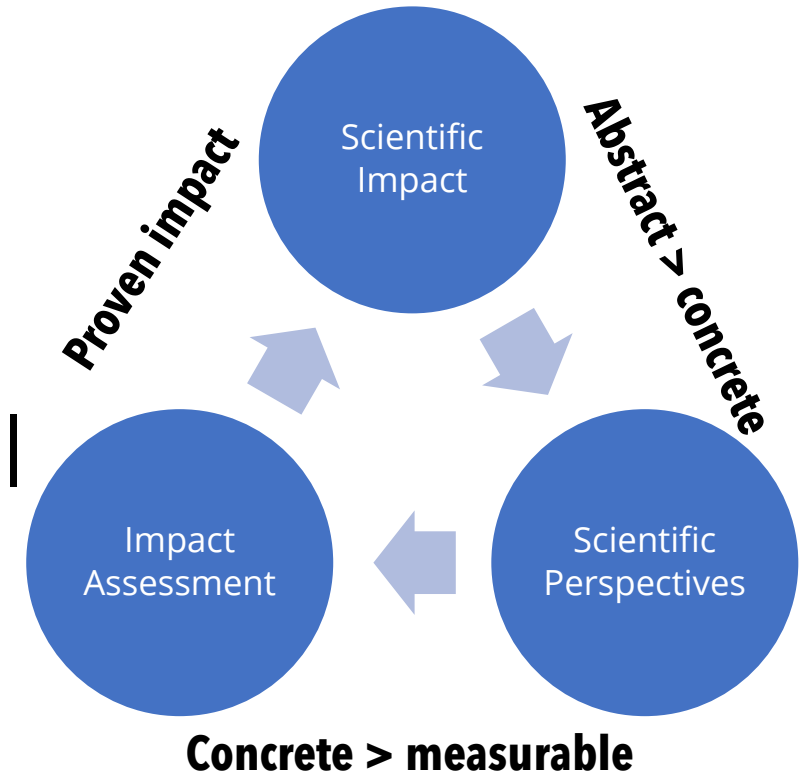
The scope of the EPOS Science Program



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

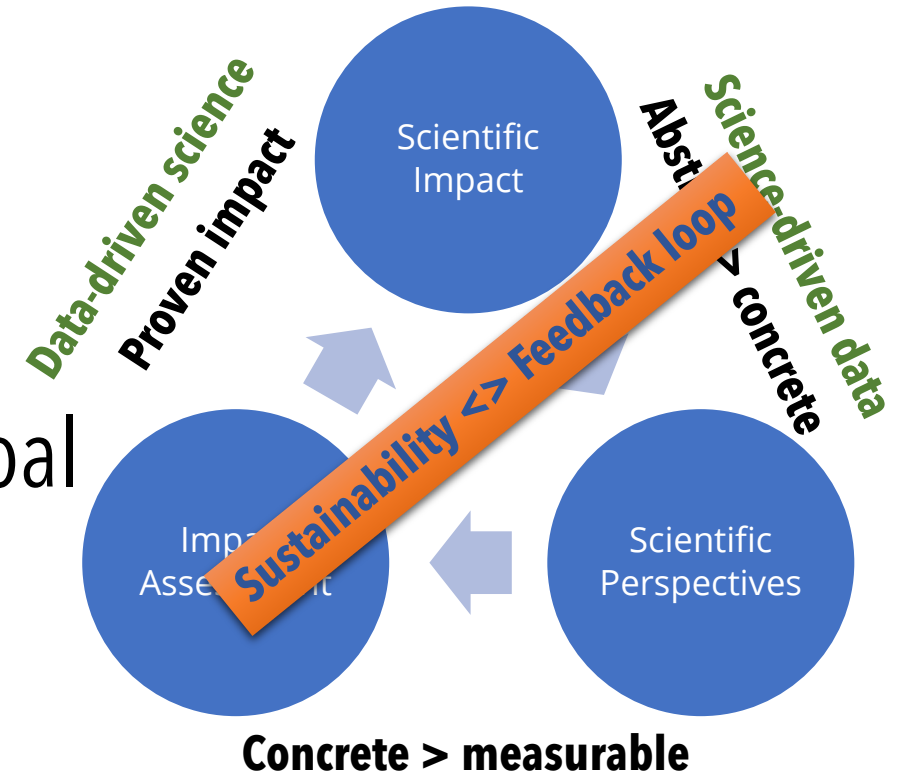


Therefore, it is a single document that allows one to understand how and why EPOS actually works for the next 5 years.

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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

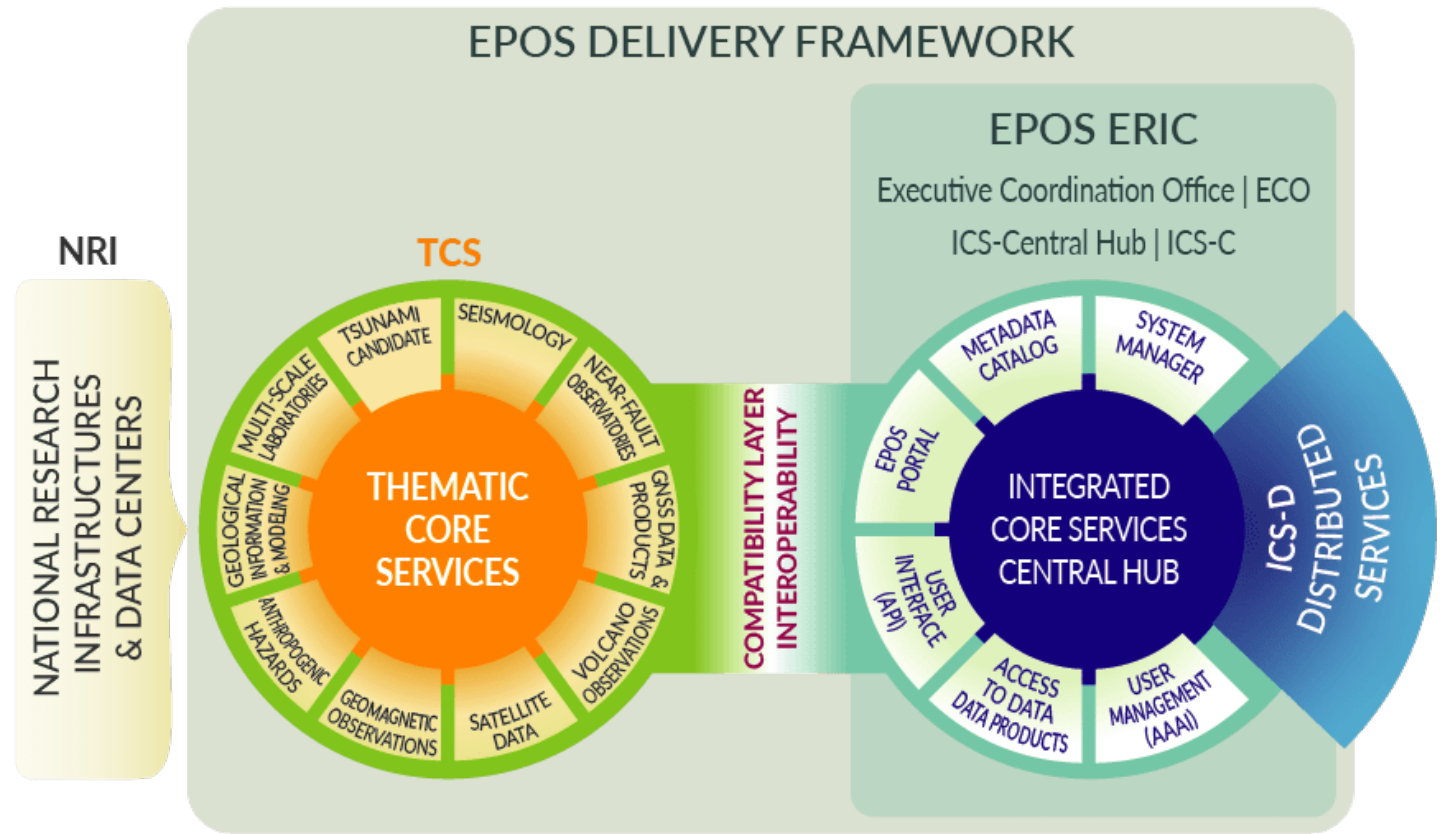
Facilitating impact on science: EPOS concepts

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**

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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)**

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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**

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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**

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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?