

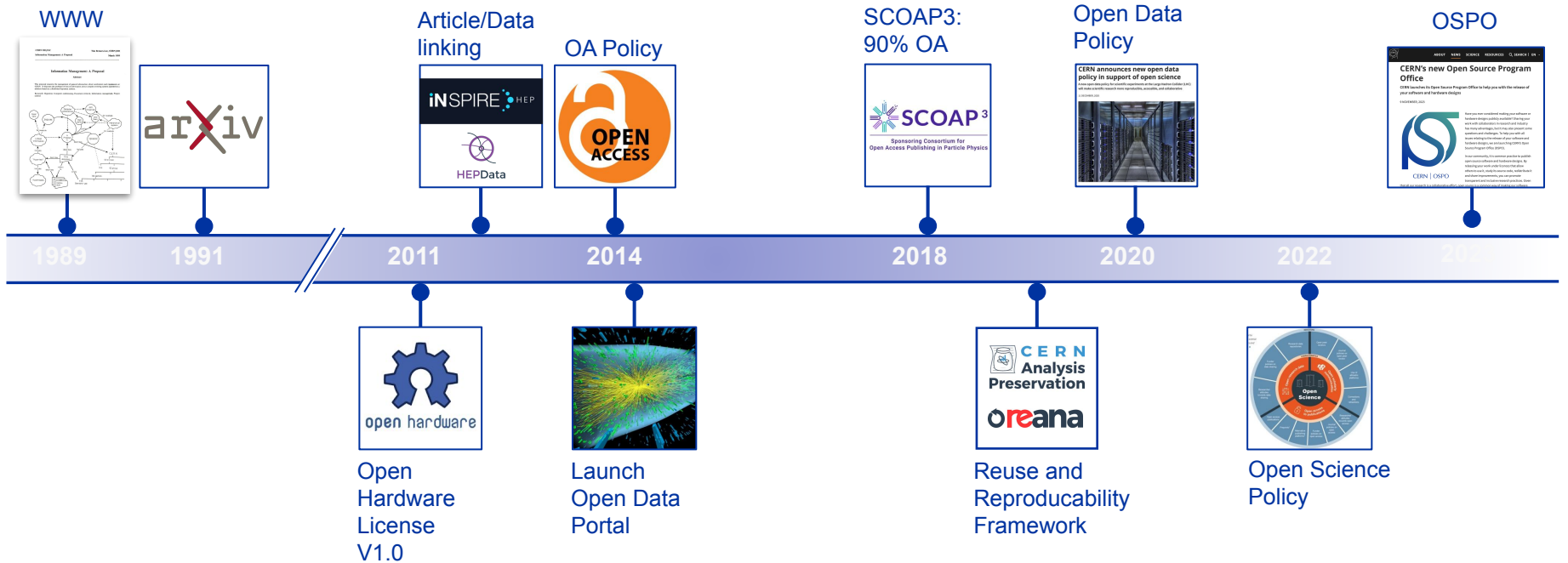
Opening Science for All at CERN

Dr Sunje Dallmeier-Tiessen, CERN

@ UNESCO and CERN Open Science Pre-events of the Closing Ceremony of the International Year of Basic Sciences for Sustainable Development

December 14th, 2023

CERN – Driving Open Science Globally



- **Captures current practice and states vision across multiple Open Science domains:**
 - Open Access to Publications
 - Open Research Data
 - Open Software
 - Open Hardware
 - Research Integrity, Reuse & Reproducibility
 - Infrastructure for Open Science
 - Research Assessment & Evaluation
 - Education, Training & Outreach
 - Citizen Science
- **Policy to be regularly updated to reflect changes in landscape, practices, funder requirements & community demands**
- **V1.0, Oct 2022: <https://cds.cern.ch/record/2835057>**

Launch of CERN's Open Source Program Office (OSPO)



CERN Open Source Program Office: Mandate



Internal Mandate

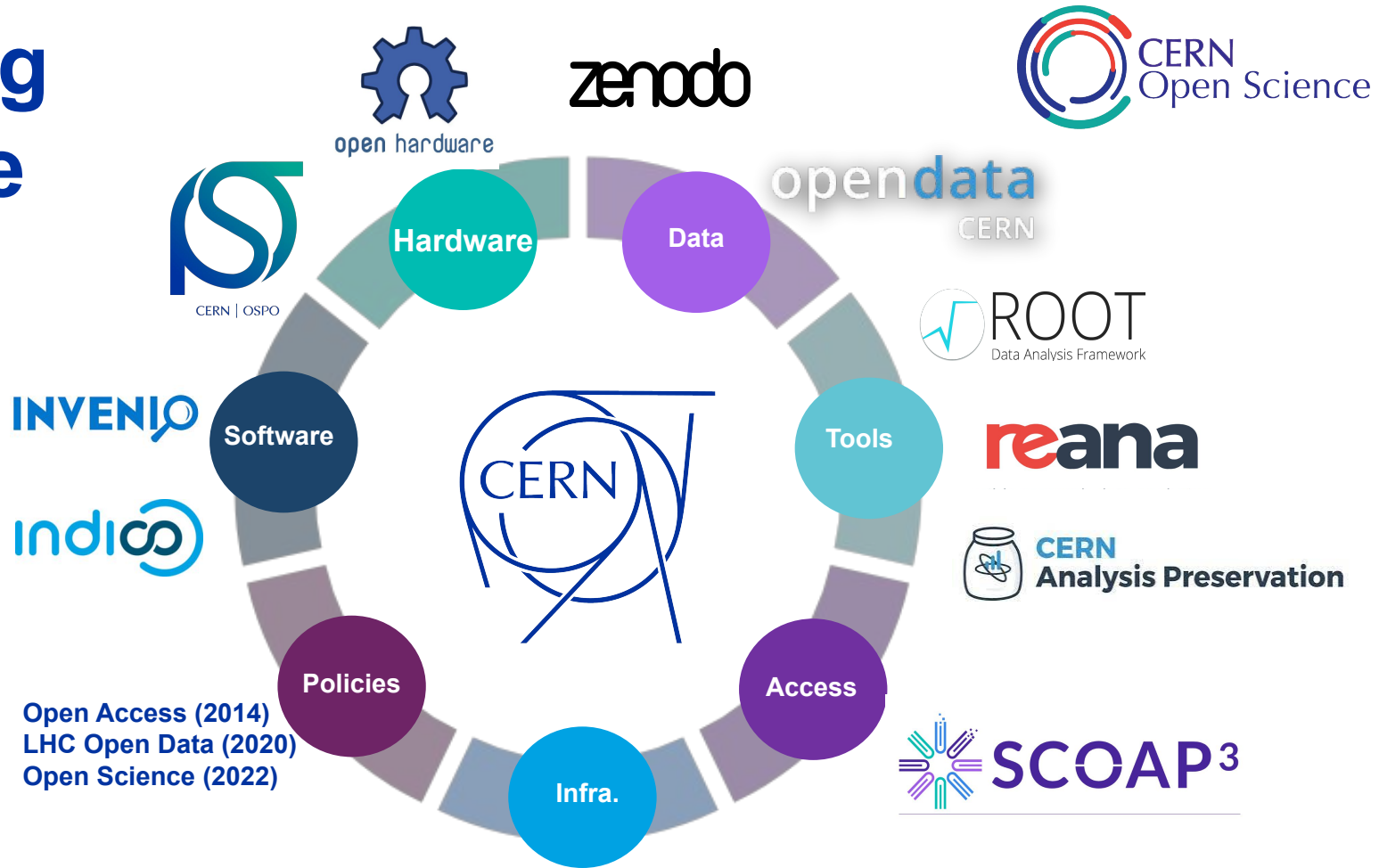
- Consult, advise, train on Open Source best practices, tools, licenses, etc.
- Advise on open-sourcing CERN software and hardware.
- Catalogue of Open Source software and hardware.
- Identify dependencies and compatibility for critical services.
- Advise CERN on Open Source matters.

External Mandate

- Showcase CERN contributions to e.g. member states' Open Source ecosystems.
- Facilitate partnerships with external entities, e.g. companies.
- Promote CERN as an Open Source lab.

Contact: Open.Source@cern.ch
<https://opensource.cern/>
Mandate: <http://cds.cern.ch/record/2879995>

Opening Science for All





Thank you!

National Aeronautics and
Space Administration



NASA and a Year of Open Science

Dr. Steve Crawford | Science Data Officer, SMD
14 December 2023

OCSDO: Kevin Murphy, Andy Mitchell, Elena Steponaitis, Chelle Gentemann,
Demitri Muna, J.L. Galache, Rachel Paseka, Paige Martin, Manil Maskey, Amy
Truong, Molly Adams, Holly Norton, Malcom Glover.



The White House announces 2023 A Year of Open Science

CDC ♦ DOA ♦ DOC ♦ DOE ♦ DOS ♦ DOT ♦ NASA ♦ NEH ♦ NIH ♦ NIST ♦ NOAA ♦ NSF ♦ SI ♦ USDA ♦
USGS

Open Science is the principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility and equity.



The background for the 'Evolution' section features a dark blue field with a large, semi-transparent padlock icon in the center. Surrounding the padlock are several hexagonal icons: a gear, a server rack, a fingerprint, a Wi-Fi signal, and a globe. A network of glowing lines and nodes is visible at the bottom, suggesting a global or interconnected system.

Evolution

The background for the 'Infrastructure' section shows a blue cloud icon composed of a grid of small squares. To the left of the cloud, a vertical column of blue squares of varying sizes and opacities suggests data flow or a digital structure. A bright blue horizontal glow is positioned below the cloud.

Infrastructure

A white circle with a blue border is centered in the image. It contains the text 'NASA's Open-Source Science Initiative' in a blue, sans-serif font.

**NASA's
Open-Source
Science
Initiative**

The background for the 'Incentives' section consists of a dark blue field with a network of glowing white lines and nodes, resembling a circuit board or a data network. The lines form a grid-like pattern with some diagonal connections.

Incentives

The background for the 'Community' section features a dark blue and purple space scene with a starry background. On the right side, there is a network of glowing blue lines and nodes, similar to the one in the 'Incentives' section, overlaid on the space scene.

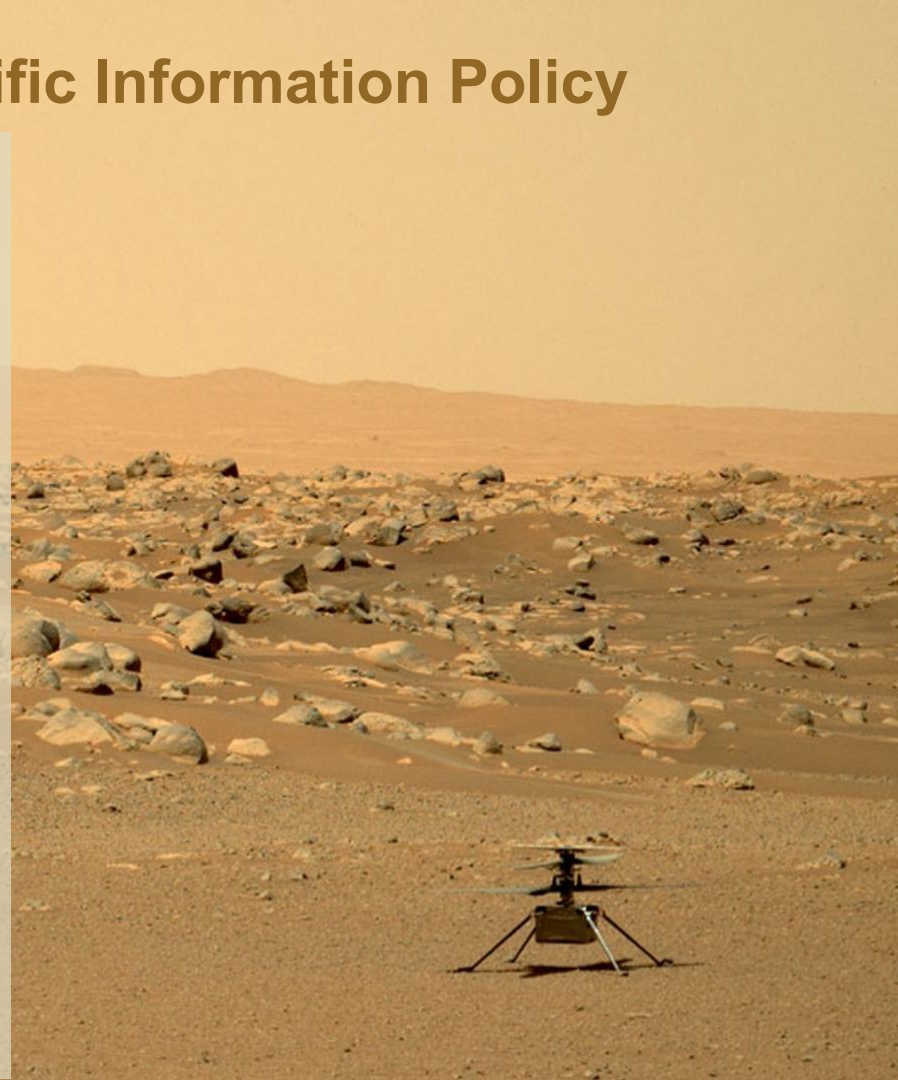
Community

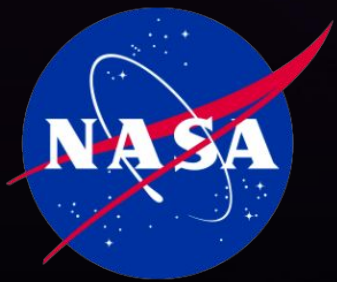


NASA SMD's updated Scientific Information Policy

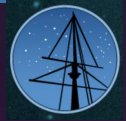
Major Policy Updates

- Peer-reviewed **publications are made openly available** with no embargo period.
- Research **data and software are shared** at the time of publication or the end of the funding award.
- Mission **data are released as soon as possible**, and unrestricted mission software is developed openly.
- Science **workshops and meetings are held openly** to enable broad participation.





NASA Science Data Portal
Your Gateway to Science Data Discovery



PDS Planetary Data System



Science
Discovery
Engine

SPD-41a
Access Plan

NASA/IBM Geospatial
Foundational Model

Pale Blue Dot
Data Challenge

Data Equity,
Access, and
Priority

ROSES

NASA's Transform to Open Science (TOPS)

A 5-year mission to accelerate adoption of open science



Goals:

- Increase understanding and adoption of open science principles and techniques
- Broaden participation by historically excluded communities
- Accelerate scientific discovery

Open Science 101

A community-developed introduction to **core open science skills** released on Dec 6!



<https://nasa.github.io/Transform-to-Open-Science/>



CERN-NASA Open Science Summit 2023

Workshop for agencies / large institutions to advance and align open science planning.

~300 participants from 70 institutions

- Closing statement
- Summary post

[Event Page](#) | [Presentations](#) | [Recordings](#)

A poster for the CERN-NASA Open Science Summit 2023. The background is a large, golden, spherical dome structure made of horizontal slats, set against a blue sky. The TOPS NASA logo is in the top left, and the CERN Open Science logo is in the top right. The main title 'Accelerating the Adoption of Open Science' is in large white text. Below it, the event details are listed: 'CERN-NASA Open Science Summit 2023', 'July 10th - 14th, 2023', and 'CERN, Geneva, Switzerland'. A QR code is in the bottom right corner.

Accelerating the Adoption of Open Science

CERN-NASA Open Science Summit 2023

July 10th - 14th, 2023
CERN, Geneva, Switzerland

More information: <https://indico.cern.ch/e/os-summit2023>





CERN-NASA Open Science Summit 2023

- Sustaining open science infrastructure
- Supporting training opportunities and resources on effective open science
- Aligning funding opportunities and recognition to promote Open Science
- Developing effective means for evaluating and rewarding open science
- Promoting diversity, equity, and inclusion along with broader societal impacts
- Engaging with the broader research community
- Fostering a culture of evidence based open science



Back up material



Open Science

is the principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility and equity.






Ensuring Free, Immediate, and Equitable Access to Federal Funded Research



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20502

August 25, 2022

MEMORANDUM FOR THE HEADS OF EXECUTIVE DEPARTMENTS AND AGENCIES

FROM: Dr. Alondra Nelson 
Deputy Assistant to the President and Deputy Director for Science and Society
Performing the Duties of Director
Office of Science and Technology Policy (OSTP)

SUBJECT: Ensuring Free, Immediate, and Equitable Access to Federally Funded Research

This memorandum provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. In accordance with this memorandum, OSTP recommends that federal agencies, to the extent consistent with applicable law:

1. Update their public access policies as soon as possible, and no later than December 31st, 2025, to make publications and their supporting data resulting from federally funded research publicly accessible without an embargo on their free and public release;
2. Establish transparent procedures that ensure scientific and research integrity is maintained in public access policies; and,
3. Coordinate with OSTP to ensure equitable delivery of federally funded research results and data.

1. Background and Policy Principles

Since February 2013, federal public access policy has been guided by the *Memorandum on Increasing Access to the Results of Federally Funded Research* (2013 Memorandum).¹ Issued by the White House Office of Science and Technology Policy (OSTP), the 2013 Memorandum

Released in August 2022 with the requirements that agencies update their Research Access plans to include immediate and free access to publications and data and to ensure research integrity.



EARTHDATA

OPEN ACCESS FOR OPEN SCIENCE



End User Average
Distribution Volume

281.45
Terabytes/Day



End User Distribution
Files Including
from Cloud

3 Billion



End User Distribution
Files from Cloud Only

290.03 Million



Distinct Users of
EOSDIS Data &
Services
(Google Analytics)

3.64 Million



Average Archive Growth

49.15
Terabytes/Day



Unique
Datasets

15,360



Website Sessions
(Google Analytics)

2.28 Million



Total Archive
Volume Including
in Cloud

71.64
Petabytes



Total Archive
Volume In Cloud Only

20 Petabytes

SMD's updated Scientific Information Policy

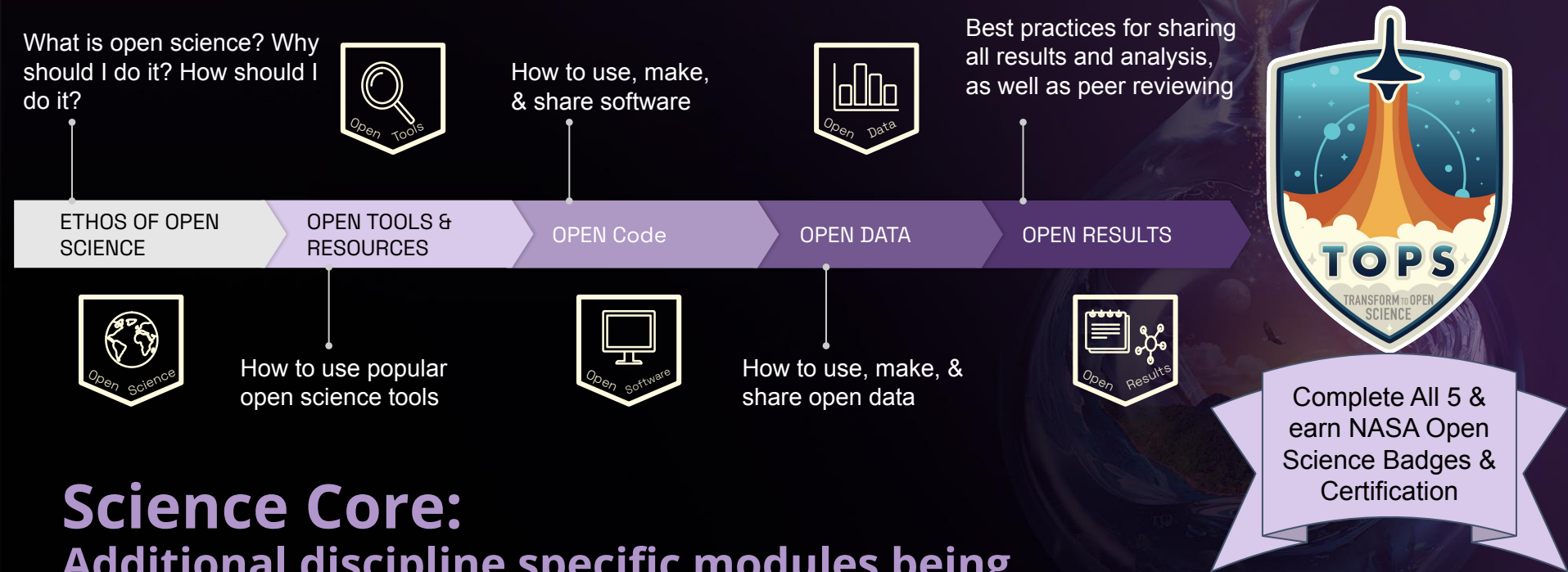
SPD-41a is *forward looking* and will apply to all future SMD-funded scientific activities

Major Policy Updates

- Peer-reviewed publications are made openly available with no embargo period.
- Research data and software are shared at the time of publication or the end of the funding award.
- Mission data are released as soon as possible and unrestricted mission software is developed openly.
- Science workshops and meetings are held openly to enable broad participation.
- During SMD proposal reviews, peer reviewed data and software shall be recognized as having the commensurate value as peer reviewed manuscripts.

TOPS Capacity Sharing: Open Science 101

5 Modules designed to introduce Open Science



Science Core:
Additional discipline specific modules being developed with more advanced material.

MUREP Data Equity, Access, and Priority



NASA is awarding \$11.7 million to eight Historically Black Colleges and Universities (HBCUs) through the new Data Science Equity, Access, and Priority in Research and Education (DEAP) opportunity. These awards will enable HBCU students and faculty to conduct innovative data science research that contributes to NASA's missions.

Foundation AI Model

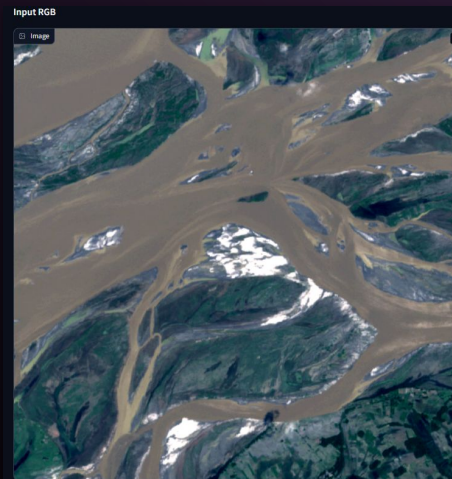
Foundational AI Models

Pretrained on NASA Harmonized Landsat Sentinel-2 dataset - can be used for multiple tasks instead of building task specific AI models

Examples of how it can be used:

- Burn scar mapping
- Flood detection
- Multi-temporal crop identification

Openly available at [Hugging Face](#) including Models, Datasets, and Code.



The pretrained [Prithvi-100m](#) model is finetuned to segment the extent of floods on Sentinel-2 images from the [Sen1Floods11 dataset](#).

(Example over India)

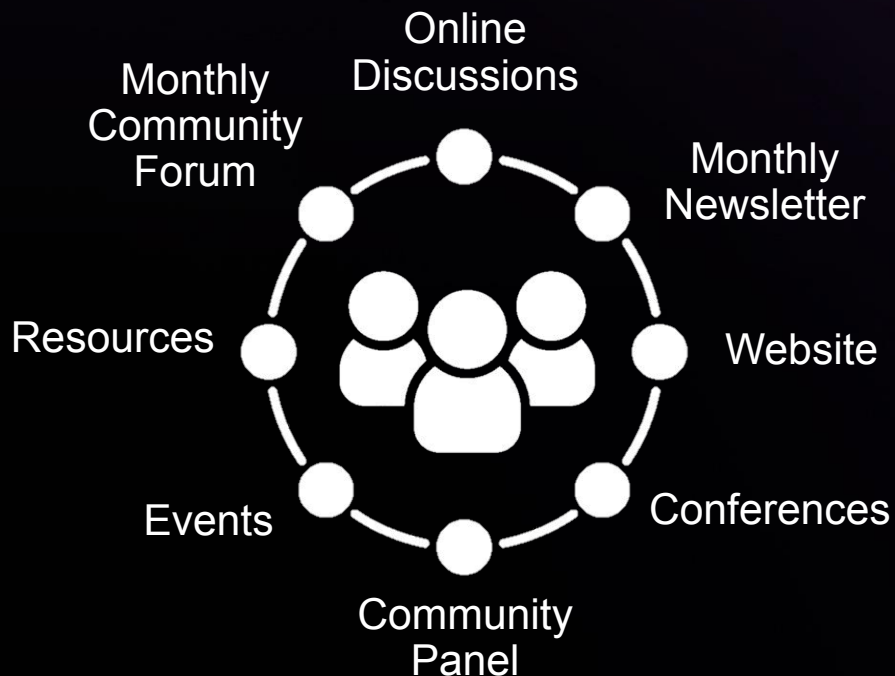




TOPS Community Engagement

Community participation is the foundation of an open scientific process.

Listening, Learning, Collaborating, & Engaging



Open Science
Success Stories:



<https://zenodo.org/record/6994587#.ZG0IUOzMJoZ>

Learn more about the Open Source Science Initiative

