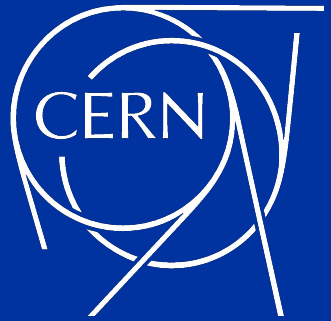


Opening Science for All at CERN

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

CERN Open Science

WWW

Article/Data linking

OA Policy

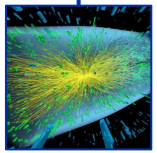
SCOAP3: 90% OA

Open Data Policy

OSPO

1989 1991 2014 2018 2020 2022

Open Hardware License V1.0



Launch Open Data Portal

Reuse and Reproducibility Framework

Open Science Policy

CERN Open Science Policy

- **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)

https://indico.cern.ch/event/1327562/

CERN Open Source Program Office: Mandate

Internal Mandate

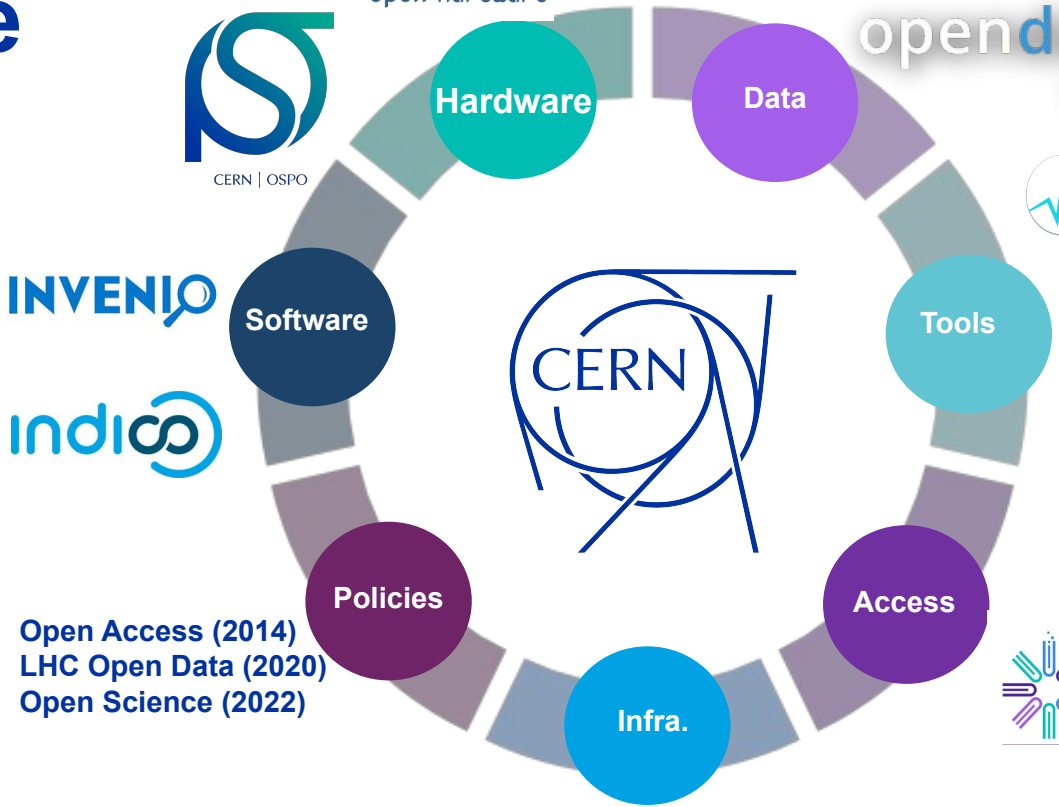
- Consult, advise, train on Open Source best practices, tools, licenses, etc.
- Advise on open-sourcing CERN software and hardware.
- Catalogue of Open Source software and hardware.
- Identify dependencies and compatibility for critical services.
- Advise CERN on Open Source matters.

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



open hardware

zenodo

CERN Open Science

CERN | OSPO

opendata CERN

ROOT Data Analysis Framework

INVENIO

reana

indico

CERN Analysis Preservation

SCOAP3

Open Access (2014)
LHC Open Data (2020)
Open Science (2022)

Thank you!

National Aeronautics and Space Administration

NASA and a Year of Open Science

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

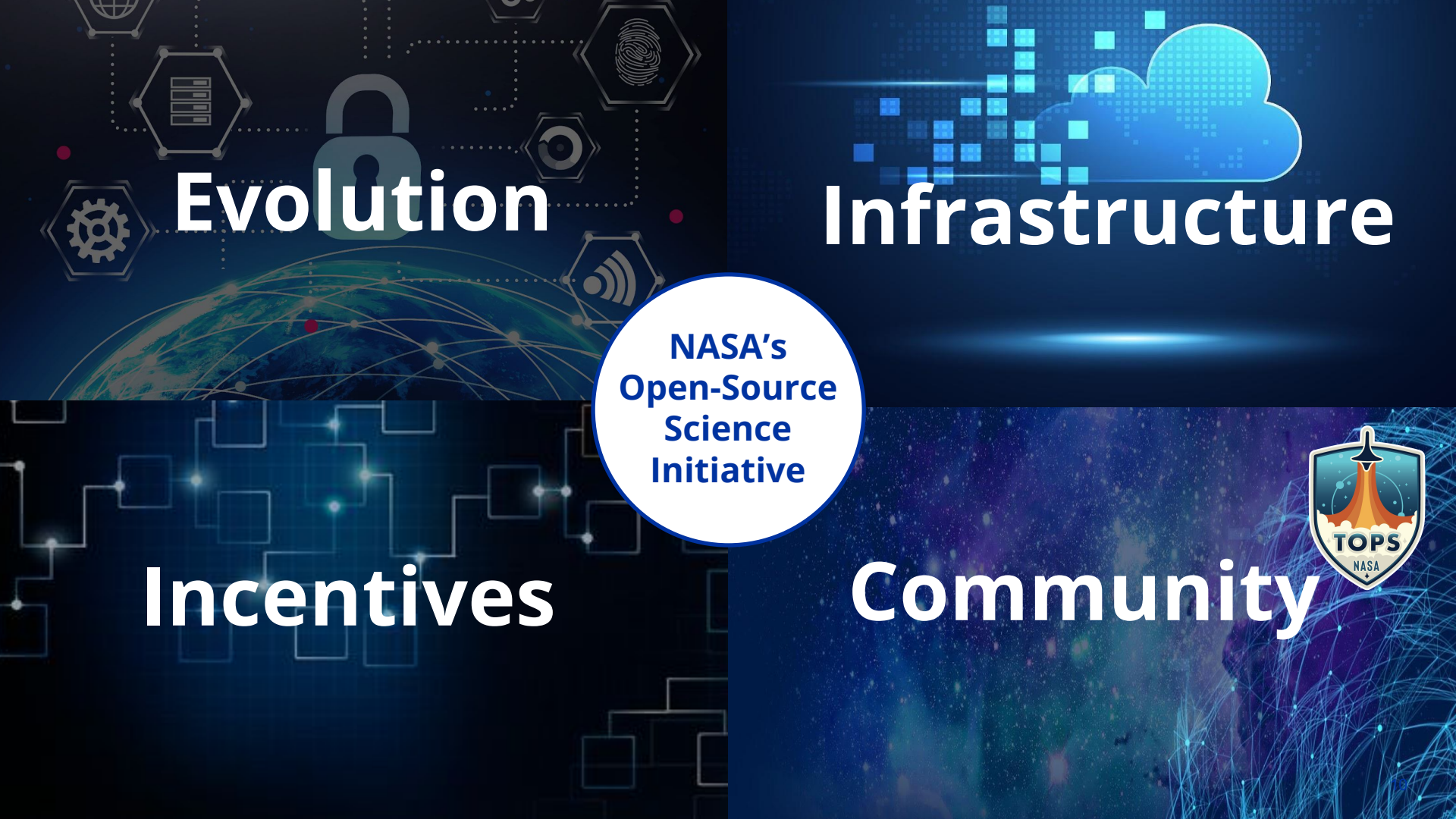
OCSDO: Kevin Murphy, Andy Mitchell, Elena Steponaitis,Chelle Gentemann, Demitri Muna, J.L. Galache, Rachel Paseka, Paige Martin, Manil Maskey, Amy Truong,Molly Adams, Holly Norton, Malcom Glover.

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

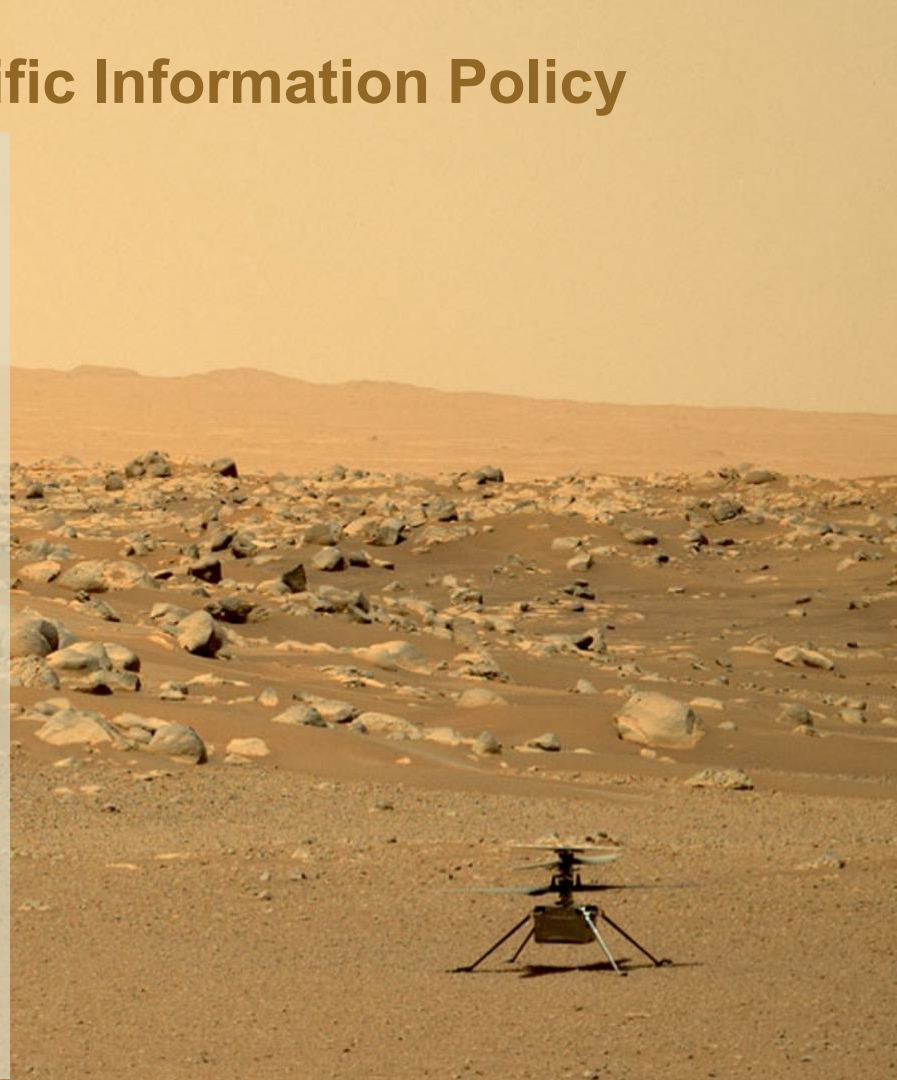
Open Science is the principle and practice of making research products and processes available to all, while respecting diverse cultures, maintaining security and privacy, and fostering collaborations, reproducibility and equity.


Evolution
Infrastructure
NASA's Open-Source Science Initiative
Incentives
Community
TOPS
NASA

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.



SPD-41a
Access Plan

NASA/IBM Geospatial Foundational Model

Pale Blue Dot Data Challenge

Data Equity, Acces, and Priority

ROSES

Science Discovery Engine

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

CERN-NASA Open Science Summit 2023

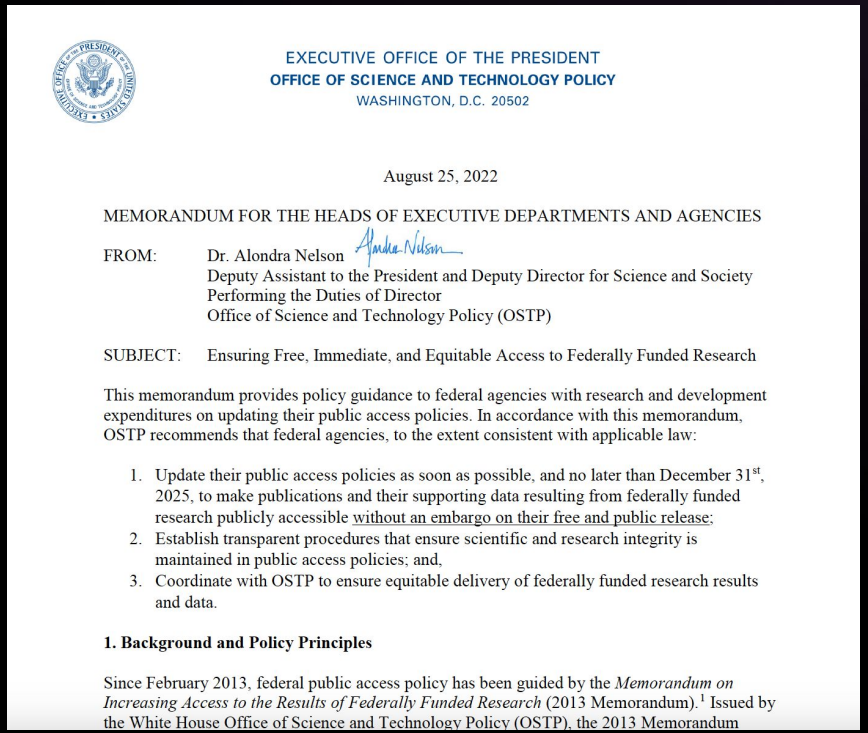
- Sustaining open science infrastructure
- Supporting training opportunities and resources on effective open science
- Aligning funding opportunities and recognition to promote Open Science
- Developing effective means for evaluating and rewarding open science
- Promoting diversity, equity, and inclusion 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

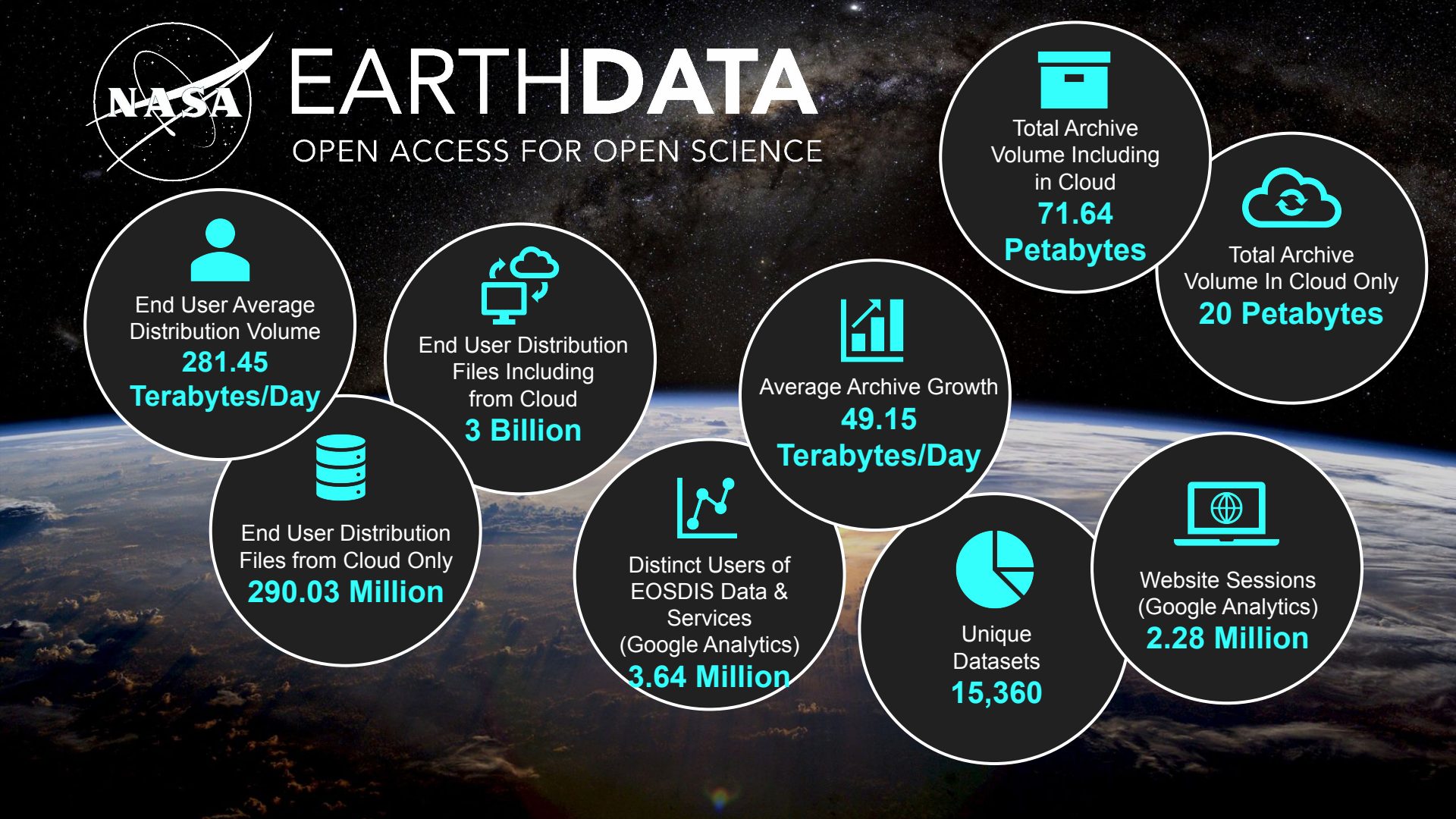
This memorandum provides policy guidance to federal agencies with research and development expenditures on updating their public access policies. In accordance with this memorandum, OSTP recommends that federal agencies, to the extent consistent with applicable law:

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.


NASA
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
Average Archive Growth
49.15
Terabytes/Day
Distinct Users of EOSDIS Data & Services (Google Analytics)
3.64 Million
Unique Datasets
15,360
Total Archive Volume Including in Cloud
71.64
Petabytes
Total Archive Volume In Cloud Only
20 Petabytes
Website Sessions (Google Analytics)
2.28 Million

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

What is open science? Why should I do it? How should I do it?

How to use, make, & share software

Best practices for sharing all results and analysis, as well as peer reviewing

ETHOS OF OPEN SCIENCE | OPEN TOOLS & RESOURCES | OPEN Code | OPEN DATA | OPEN RESULTS

How to use popular open science tools

How to use, make, & share open data

Complete All 5 & earn NASA Open Science Badges & Certification

Science Core:

Additional discipline specific modules being developed with more advanced material.

MUREP Data Equity, Acces, 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.

Foundational AI Models

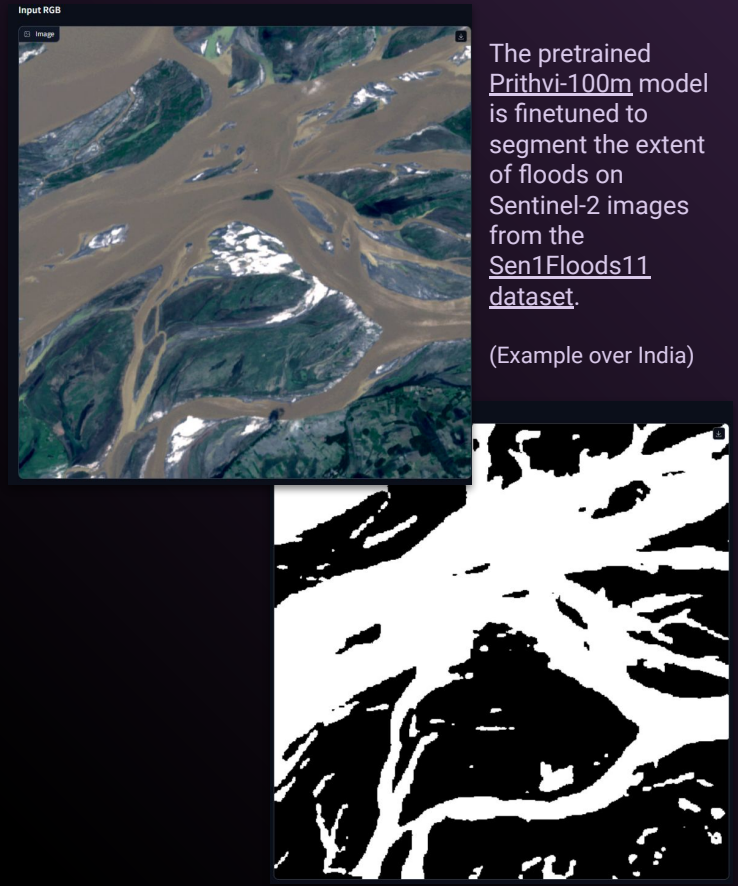
Pretrained on NASA Harmonized Landsat Sentinel-2 dataset - can be used for multiple tasks instead of building task specific AI models

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.

See the article on Earth Data for more details.



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#.ZG0lUOzMJoZ

Learn more about the Open Source Science Initiative