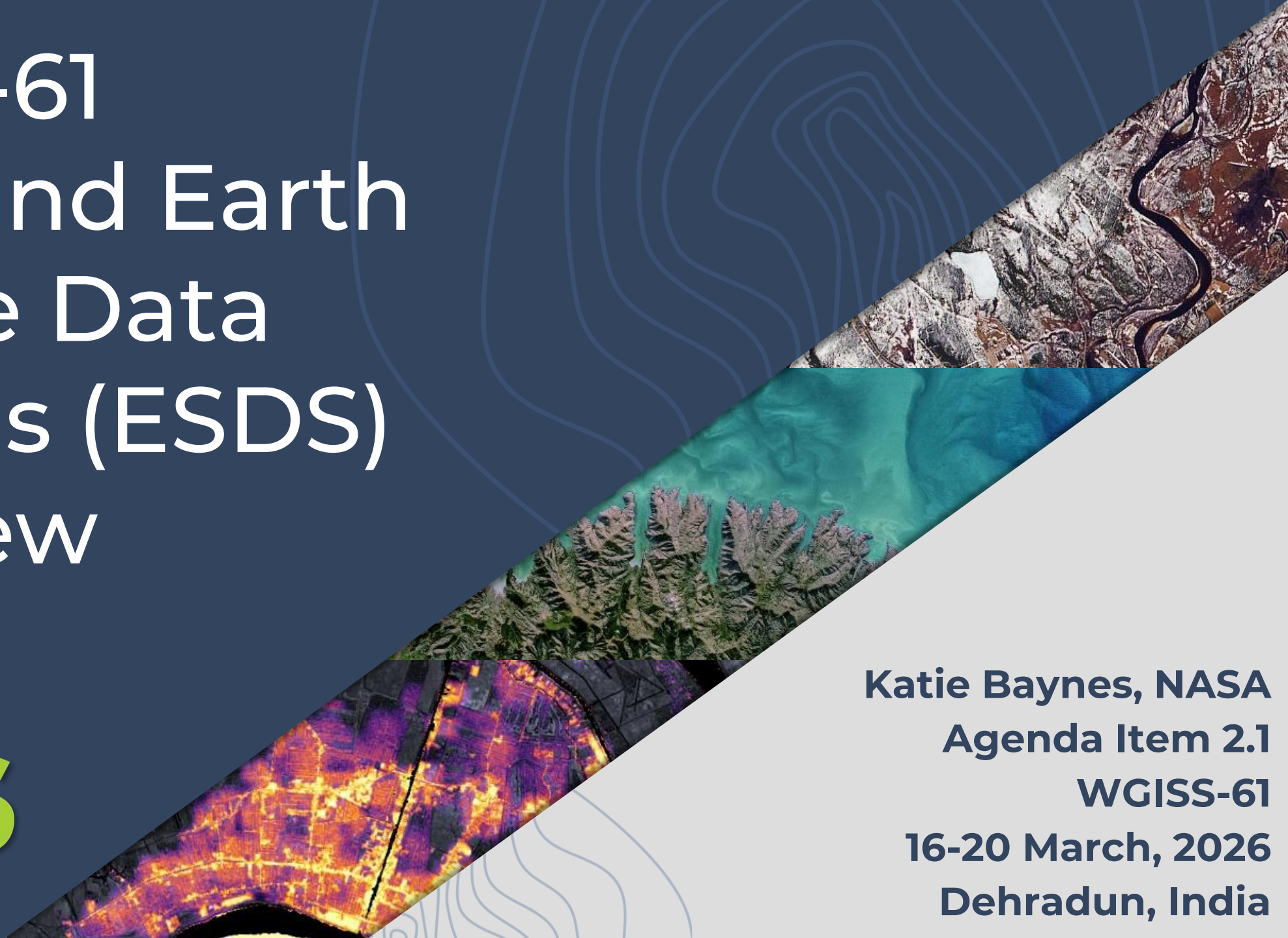
WGISS-61 NASA and Earth Science Data Systems (ESDS) Overview



CEOS
Committee on
Earth Observation Satellites

Katie Baynes, NASA

Agenda Item 2.1
WGISS-61
16-20 March, 2026
Dehradun, India

NASA HQ Earth Science Division Leadership

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Division Director

Julie Robinson
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Earth Action

Thomas Wagner
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Deputy Associate Director

NASA earth

10.08.2025

Strategic Approach

- **Focus on NASA-unique Capabilities**
  - Flight: Prioritize missions for which NASA is a global leader
  - Technology: Focus on quantum, targeted advanced sensing, rapid transition to operations and commercialization
  - Data: Focus on NASA data discovery and usability
  - Science & Applications: Focus on accelerating multi-mission/multisource discovery and pipeline to applications
  - Applications: Increase focus on economic sector stakeholder needs
- **Focus on National challenges**
  - Wildland fires
  - Water and food security
  - Economic growth and connections to the private sector
  - Resilience at state and local levels

Earth Science to Action Strategy

Virtuous Cycle
- User needs inform next iteration of programs, missions and initiatives

Public Understanding & Exchange
- Put more scientific understanding into public sphere
- Deliver applied science to users
- Participate in multi-way info exchange
- Use input to inform subsequent work

Solutions with Value to the Nation
- Offer models, scientific findings and info through Open-Source Science principles
- Support private sector development of applications of Earth observations
- Provide science applications and tools to inform decisions

Earth System Science & Applied Research
- Grow scientific understanding of Earth's systems
- Develop predictive models of dynamic Earth systems and tools to understand and adapt to changes

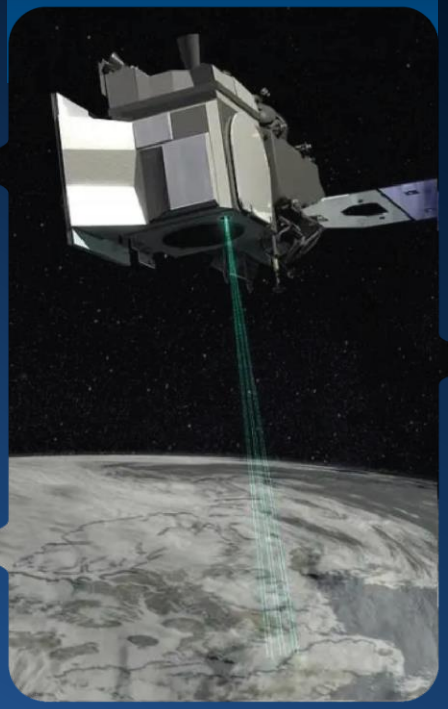
Foundational Knowledge, Technology, Missions & Data
- Technology innovation
- Earth observations missions
- Data collected from space, air and ground

NASA's End-to-end Earth System Science Capability

Technology

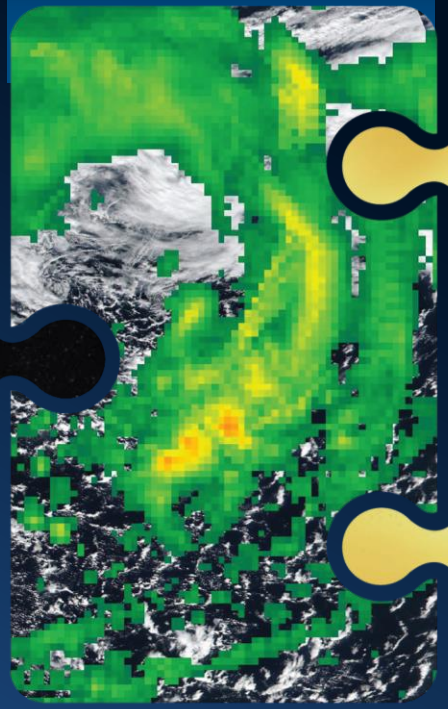
10 Tech Infusions/year

Flight



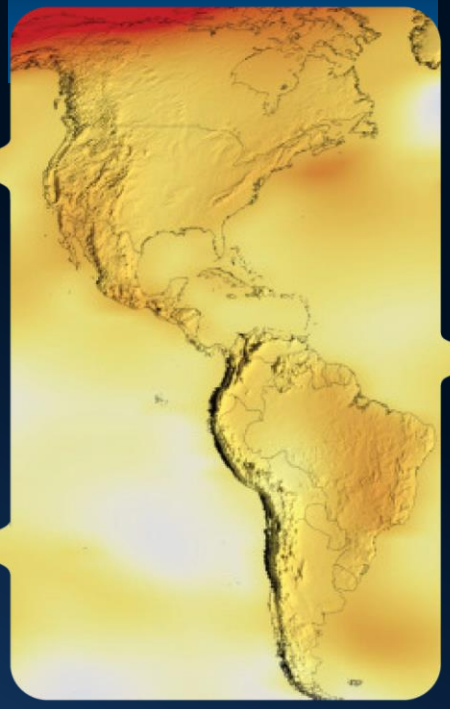
24 missions on orbit

Data and Modeling



Collect 160 TB/Day
Serving 600 TB/Day
>10M Users
World-Class Models

Research



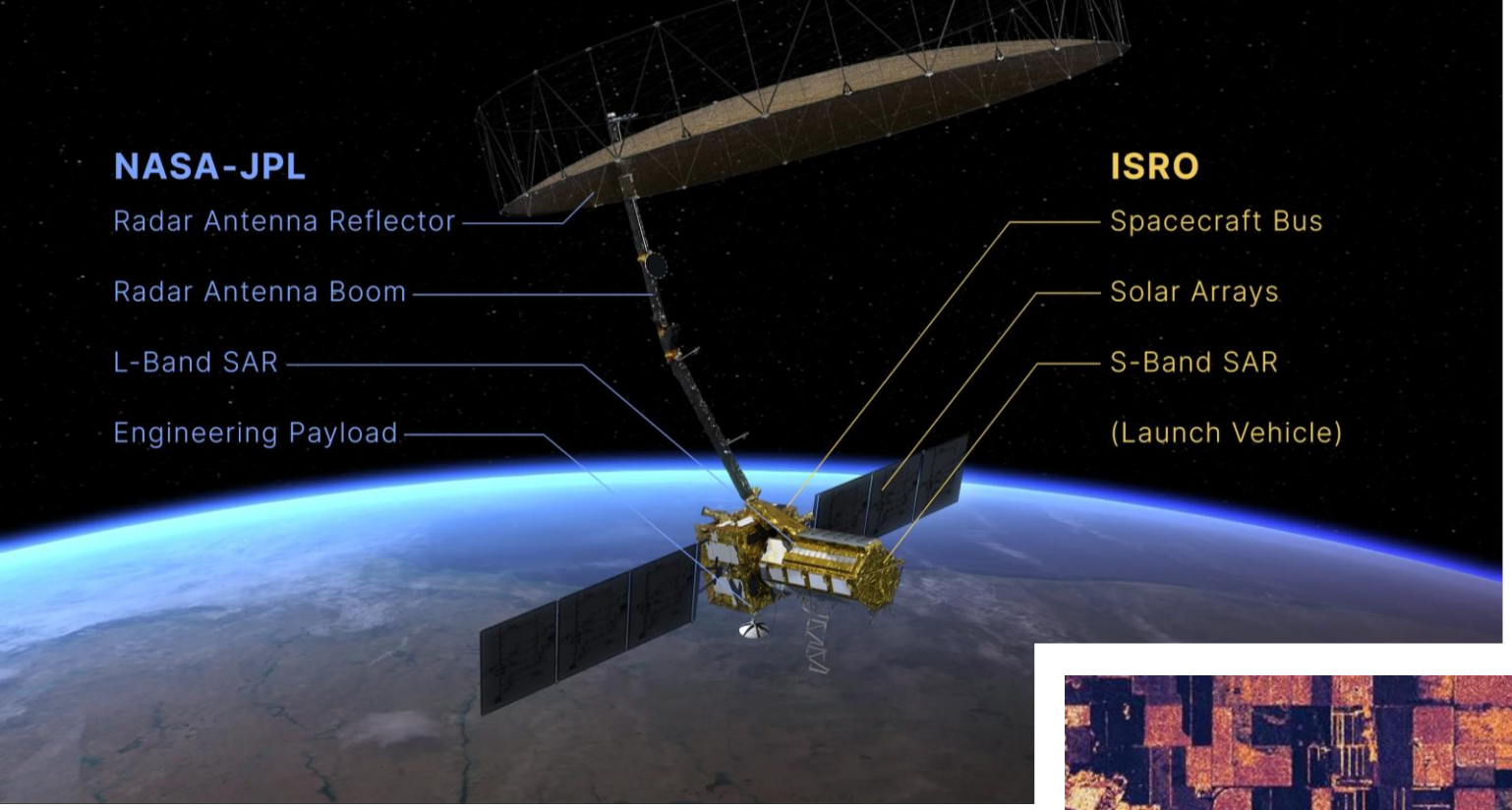
1,330 Active Research Projects
48 States

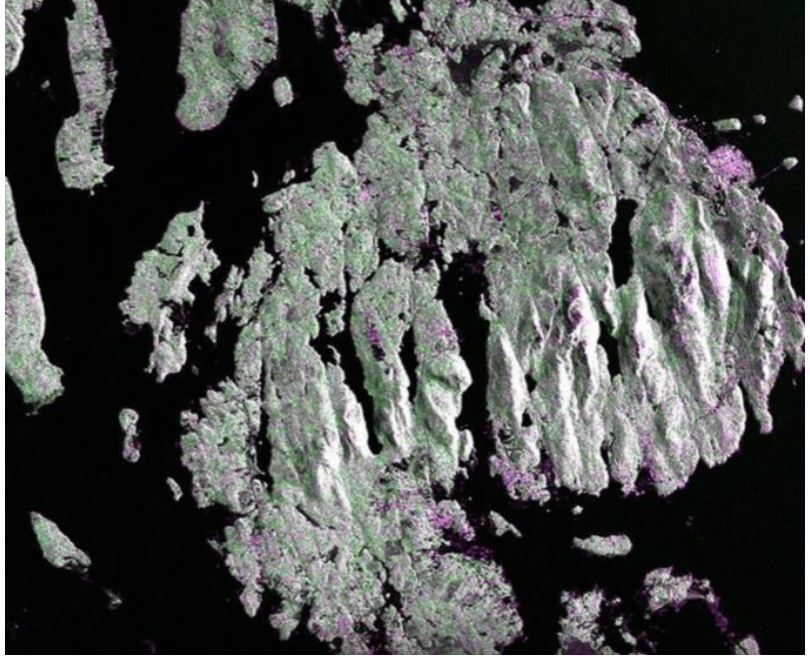
Earth Action

Agriculture
Energy
Disasters
Wildfires
& more

Highlights: Sentinel-6B

- Launched from VSFB on Nov. 16, Sentinel-6B is the second satellite in a series of two (following Sentinel-6A)
- Ocean surface topography measurements by satellite altimetry for nearly 40 years
- Measurements form basis for flood predictions for coastal infrastructure, real estate, energy storage sites, & other coastal assets
- Data also supports:
  - Short-term forecasting for weather predictions and long-term forecasting for seasonal conditions
  - Operational oceanography,
    - Improving forecasts of ocean currents and wind
    - Wave conditions
    - Critical for navigation, search and rescue, and debris tracking





NISAR's Actionable Science!

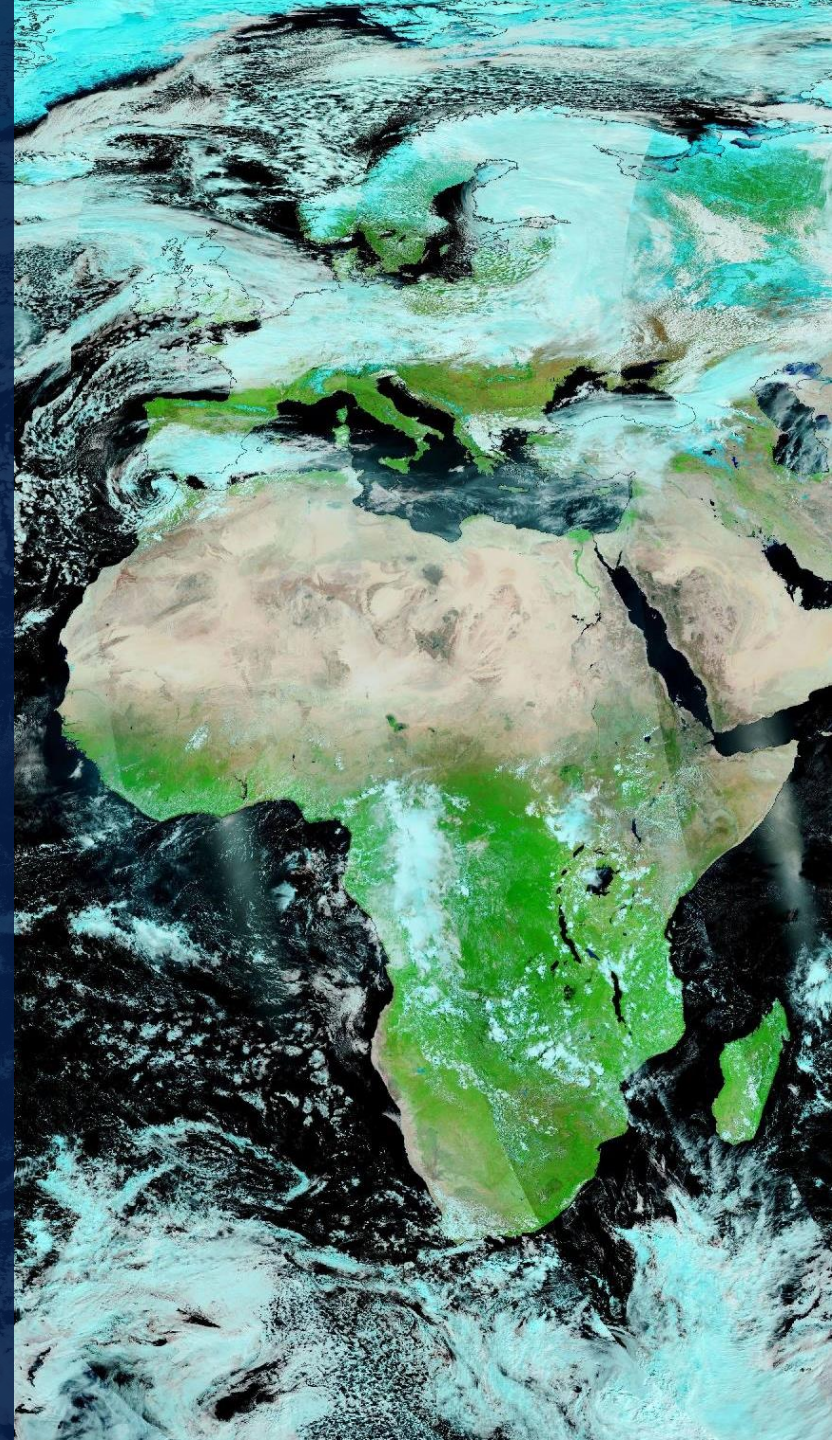
More than 180 organizations ready to use NISAR science and data

Earth Science Data Systems

Earth Science Data Systems (ESDS) program oversees the entire Earth science data life cycle and facilitates unrestricted access to the data that researchers, managers, and governments need to understand and protect our planet.

Programmatic goals:

- Increasing Data Systems Quality & Efficiency
- Enabling and Advancing Open Science
- Evolving Data Systems Capabilities
- Fostering and Building Community in Earth Science



ESD Operates One of the Largest Open Archives on the Planet

EARTH DATA ARCHIVE SUMMARY

END FY25

End User Average Distribution Volume
600 TB/Day

End User Distribution Files incl. From Cloud
7.8 Billion (4.3B in Cloud)

Total Archive Volume Including in Cloud (not inc duplicate on-prem)
148.8 PB

Website Sessions (Google Analytics)
14.9 Million

Average Archive Growth
160 TB/Day*

EOSDIS Customer Satisfaction Index Score (2024)
78

Total Archive Volume In Cloud Only
116.2PB

Total Number of Files Cataloged (On-Prem and Cloud)
4.6 Billion

Unique Datasets
18,755

Distinct Users of EOSDIS Data (Inc. Services such as Worldview and GIBS) (Google Analytics)
29.8 Million

*NISAR may add ~66TB/day

From DAACs to SETs

In the near future, NASA's ESDS will be modernizing its organizational structure.

We will be consolidating from 11 DAACs, realigning to a smaller number of Science-Enabling Teams (SETs).

Goals:

- To be more efficient in cost and operations,
- To better enable science including interdisciplinary and multisource science, and
- To be able to meet and achieve Earth Science to Action strategic priorities.

Ingest and Archive Consolidation

This work directly supports the transition from distributed data centers (DAACs) to streamlined Science Engagement Teams (SETs) -- reducing backend complexity so resources can shift toward science-facing services and users.

- Simplifying the systems that receive, store, and provide access to Earth science data.
- 54 → 9 systems (83% reduction)
- 12 → 1 team managing development and operations
- Data preservation, international partnerships, and public access remain fully protected
- Designed to operate sustainably with flexible budgets

Additional Opportunities for Innovation

Search Accessibility

Unique Datasets
18,000+

One Unified Website

Cloud Transition

More Data in Cloud Accessible Formats

More Open Code, Open Development, Open Science

AI and ML

Improving Discovery Accessibility and Operational Efficiency

HLS-AI model Prithvi