



Office of the Chief Science Data Officer
YEAR IN REVIEW
2024



Message from NASA's Chief Science Data Officer



Dear Colleagues and Friends,
As we bid farewell to 2024, it is with immense pride and excitement that I reflect on the remarkable achievements and progress made by the Office of the Chief Science Data Officer (OCSDO) within NASA's Science Mission Directorate (SMD). This year has been a testament to our commitment to advancing transformative science through innovation, collaboration, and open practices.

In 2024, our mission to enhance the accessibility, usability, and impact of NASA's scientific data has reached new heights. We successfully developed and implemented groundbreaking data science techniques, evolving our data and computing systems to ensure they are efficient, sustainable, and secure. Our efforts in fostering a culture of open science have empowered researchers worldwide, enabling them to share their work more effectively and accelerate scientific discovery.

As we look to the future, the OCSDO remains dedicated to driving scientific breakthroughs and maximizing research impact through cutting-edge data practices and strategic partnerships. Together, we will continue ensuring that NASA's scientific data serve as a catalyst for discovery and progress.

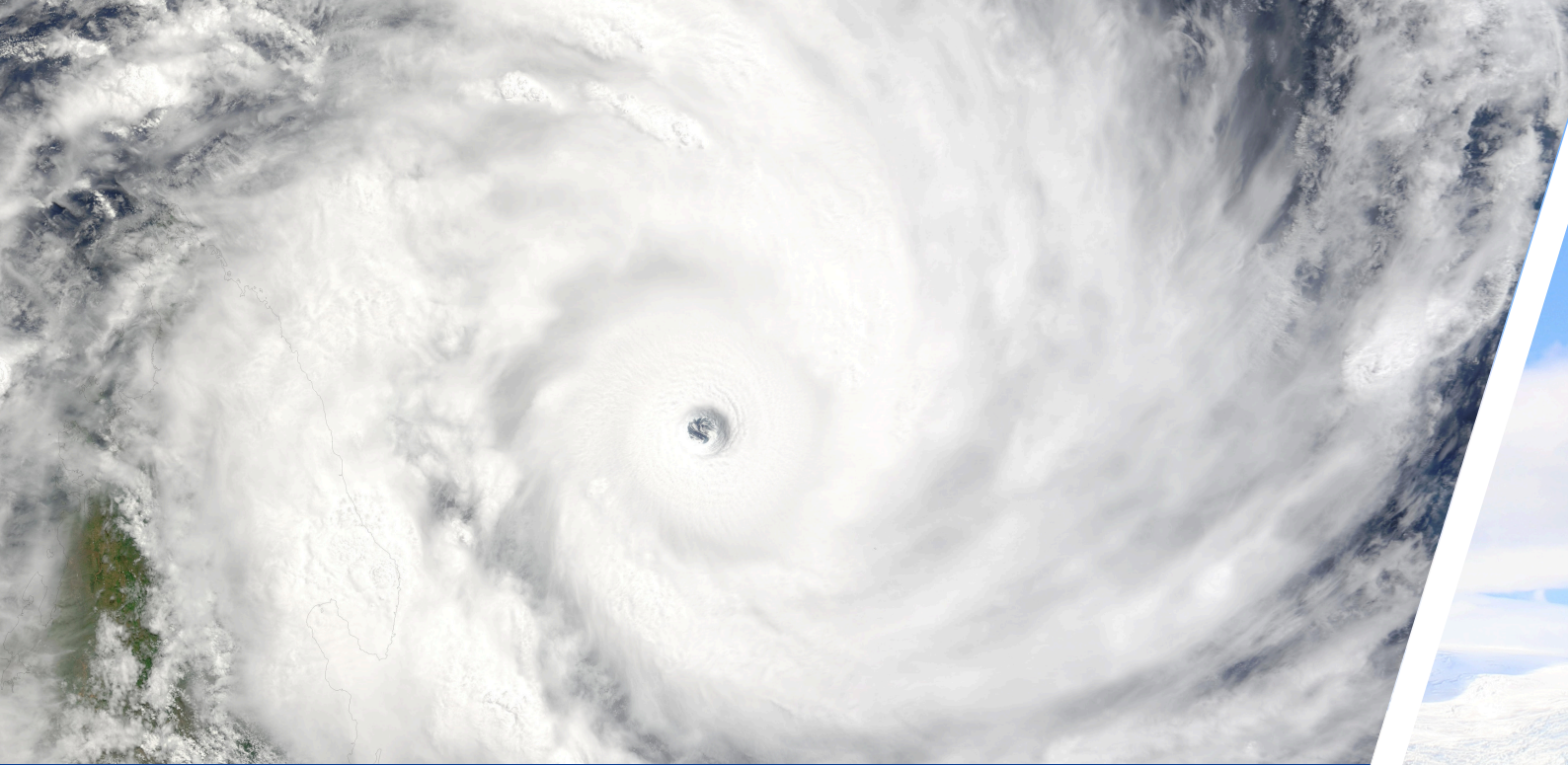
Thank you for your continued support and collaboration. Here's to another year of innovation and success.

Warm regards,

A handwritten signature in black ink, appearing to read 'KM', written over a faint background graphic of a satellite and a mountain range.

Kevin Murphy, Chief Science Data Officer
NASA Science Mission Directorate

CHIEF SCIENCE DATA OFFICER



NASA AND IBM PRITHVI MODELS ENHANCE EARTH APPLICATIONS

In 2023, NASA and IBM launched the [Prithvi Geospatial](#) foundation model, an AI model that integrates vast amounts of NASA's geospatial data. This year, the model received a significant upgrade with the integration of global Harmonized Landsat and Sentinel (HLS) data.

Building upon the Prithvi family of foundation models, 2024 also marked the successful launch of the [Prithvi Weather-Climate](#) foundation model, designed to enhance climate forecasting and weather prediction.

These advancements make NASA's data more accessible and actionable than ever before, enabling a wide range of earth applications, from environmental monitoring to disaster management and agricultural planning.

Learn more about OCSDO's AI efforts for accessibility of NASA's science data [here](#).



NASA's TOPS Project Trains Over 2,000 Researchers

In 2024, the [Transform to Open Science \(TOPS\)](#) project made significant strides in promoting the principles and practices of open science. Through the development of an open-source training curriculum, Open Science 101, TOPS successfully trained over 2,000 individuals, equipping them with the knowledge and skills needed to engage in collaborative scientific research. This initiative exemplified NASA's commitment to fostering a culture of openness and innovation, empowering scientists and researchers to share their work more effectively and accelerate scientific discovery.

To learn more about Open Science 101, and to take the course, visit go.nasa.gov/os101.



NASA AWARDS \$17M IN OPEN SCIENCE FUNDING

NASA awarded \$17 million in grant funding to projects supporting open science. These investments accelerate scientific discovery, drive innovation, and foster a more collaborative and open research environment within the scientific community.

Open-Source Tools, Frameworks, and Libraries Awards: These grants provide support for the sustainable development of tools, frameworks, and libraries that are freely available to everyone. These resources are crucial for achieving the goals of SMD. This award category ensures that essential tools and resources are developed and maintained for the scientific community. You can see this year's awardees [here](#).

High Priority Open-Source Science (HPOSS) Awards: These awards focus on projects that aim to increase the accessibility, inclusivity, or reproducibility of SMD research. The funded projects include the development of open-source tools, software, frameworks, data formats, and libraries. Each HPOSS award is for one year and provides approximately \$100,000 to projects that will have a significant impact on the SMD science community. You can see this year's awardees [here](#).

SCIENCE DATA AND COMPUTING ARCHITECTURE STUDY

In August, we completed and released the comprehensive SMD Science Data and Computing Architecture Study, laying the foundation for a unified and efficient data infrastructure across NASA. This study identified key areas where we can enhance data interoperability, streamline workflows, and optimize computing resources.

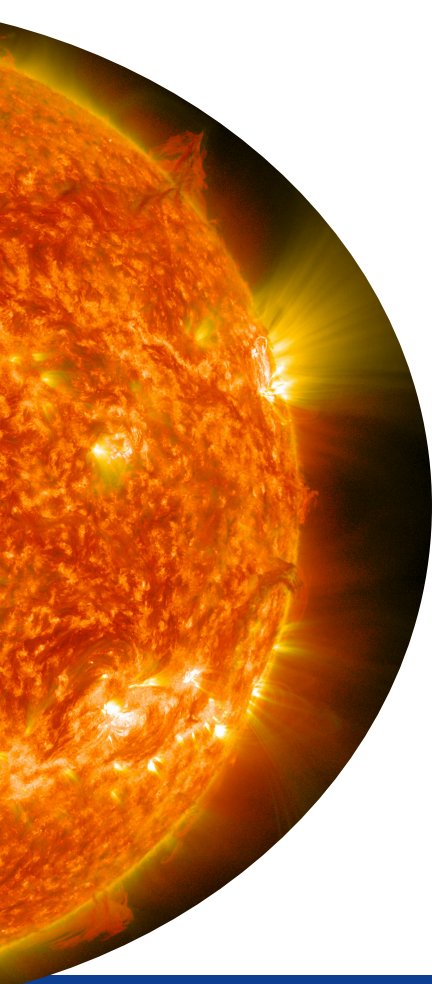
Implementation Roadmap: The findings have informed our roadmap for modernizing NASA's science data platforms, ensuring that scientists and the public have seamless access to high-quality scientific data.

Read the full study [here](#).

WORKSHOPS AND COMMUNITY ENGAGEMENT:

The OCSDO hosted a series of impactful workshops to foster collaboration and share expertise within the scientific community:

- **AI Workshop:** Focusing on the application of artificial intelligence in space science, we brought together experts to explore cutting-edge AI solutions for data analysis and mission planning. Learn about the outcomes of this workshop [here](#).
- **Software for the Science Mission Directorate (SMD) Community Workshop:** This event provided a platform for sharing best practices in software development, enhancing the quality and reliability of software used across NASA missions. Learn about the outcomes of this workshop [here](#).
- **Data Repositories Workshop:** We gathered data managers and scientists to discuss strategies for improving data repositories, ensuring that NASA's vast datasets are accessible, well-documented, and user-friendly. (Report coming soon.)



MAKING NASA'S SCIENCE DATA MORE DISCOVERABLE

This year, the OCSDO achieved the operational launch of the Science Discovery Engine (SDE), furthering access to scientific information.

The SDE enables the discovery of over 95% of NASA's science data, code, software, and documentation – a 10% increase since 2023. Significant improvements include an enhanced user interface for easier filtering by science topic, prominently featured NASA data repositories in search results, and the development of a prototype for a Large Language Model-enabled search environment.

Access the Science Discovery Engine [here](#).

BRINGING DATA TO LIFE

In December, Salesforce Tower Day for Night in San Francisco, California, presented “Synchronicity,” a video artwork by Greg Niemeyer, a data artist and professor at UC Berkeley. This piece transformed a year of Bay Area environmental data from NASA, NOAA, the Berkeley Seismology Lab, and the Bay Area Air Quality Management District into 20 minutes of dynamic animation, aligned with the winter solstice.

The project, with assistance from Dr. Chelle Gentemann, program scientist for OCSDO, demonstrated the power of NASA's open data, enabling innovative and thought-provoking art that connected viewers to the natural rhythms of our world and inspired a vision for a cleaner, safer, and more connected future.

IMAGE CREDIT: EMMA STREBEL



WHAT'S NEXT?

Our achievements in 2024 are a testament to the dedication, creativity, and collaboration of our teams and partners. As we look ahead to 2025, we remain committed to:

- **Advancing Data Architecture:** Implementing the recommendations from the Core Data and Computing Architecture Study to enhance data accessibility and interoperability.
- **Innovating with AI and Modeling:** Further developing the Prithvi models and adding a new model for heliophysics, exploring new AI solutions to address emerging scientific challenges surrounding our Sun.
- **Strengthening Community Engagement:** Hosting additional workshops and collaborative events to bring together experts, foster innovation, and address key challenges in science and data management.
- **Expanding Training Library:** Continuing to grow our training programs fostering a community of open science practitioners.



LEARN MORE:

- [About NASA's Office of the Chief Science Data Officer](#)
- [AI for NASA Science](#)
- [Open Science at NASA](#)