National Aeronautics and Space Administration

Update from NASA Health and Air Quality Applications

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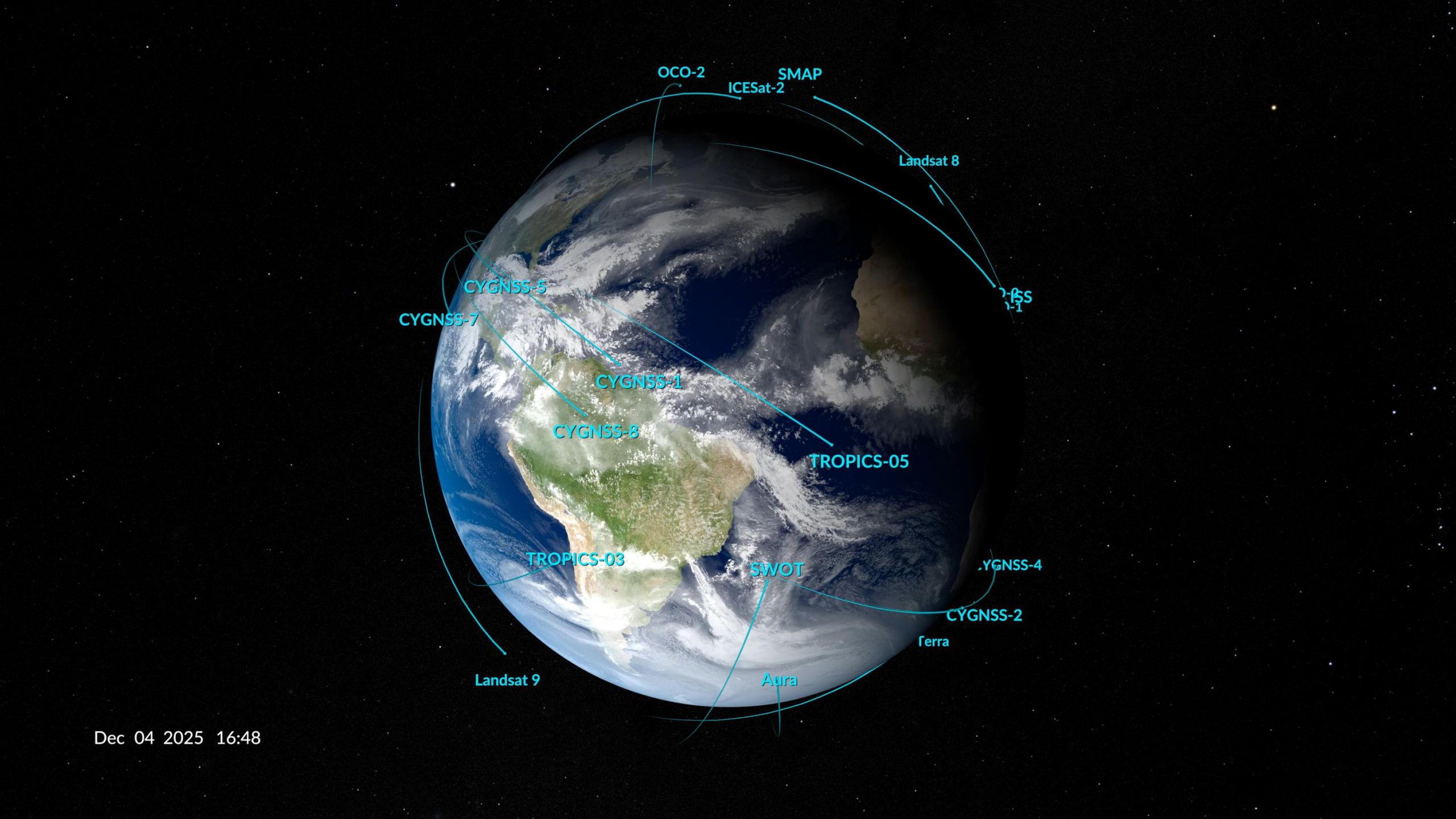
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The Upfront:

Increasing the Speed of Earth Science

NASA's Earth Science Division is accelerating functions and simplifying processes with the goal of increasing speed of science and scale of impact.

- **Speed to orbit**
- **Speed to science and scientific discovery**
- **Speed and scale of impact of science**
- **Driving interdisciplinary science to go after most complex questions**

Three Major Objectives in Implementing Earth Science in 2026

Drive Alignment with Presidential Priorities

- Advance Gold Standard Science and understanding of the Earth System
- Technology Innovation & Advancement
- Economic Growth
- Strengthen National, Regional and Local Preparedness and Resilience

Focus on Impact

- Reduce programmatic complexity of ES Research and Applied and Responsive Earth Sciences
- *Multisource Integrated Observatory* to maximize science and applications value from NASA and commercial missions
- Modeling integration to answer complex questions
- Engage the broader Earth Observation community including private sector service providers and end-users, academia, commercial EO industry, and state and local governments

Drive Efficiency

- Improved fidelity of planning for DAAC transition to Science Enabling Teams
- Focus on more rapid mission development timelines
- Streamlined and faster ROSES solicitations

Strategic **Approach**

- **Focus on NASA-unique**
  - **Flight:** Prioritize missions for which NASA is the 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
  - Health and air quality
  - Economic growth and connections to the private sector
  - Resilience at state and local levels
- **Ensure executability**

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

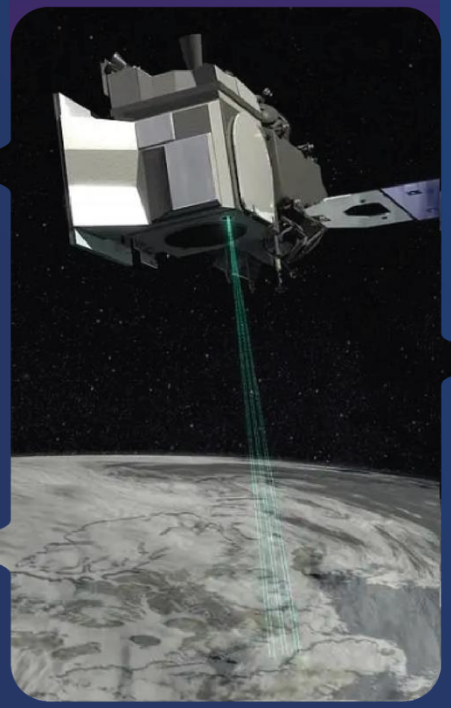
Foundational Knowledge, Technology, Missions & Data
- Technology innovation
- Earth observations missions
- Data collected from space, air and ground

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

Technology

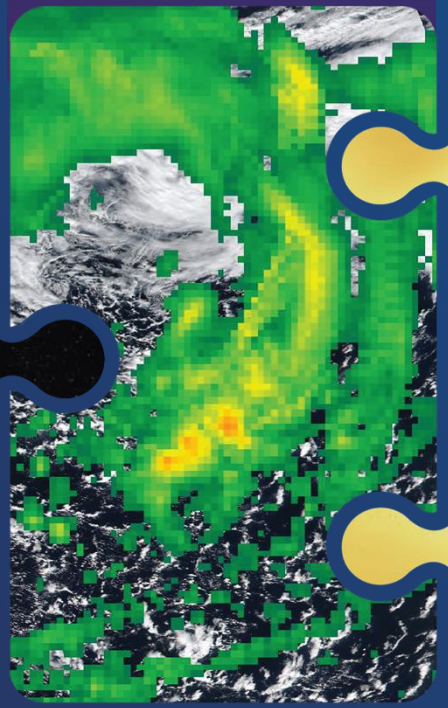
10 tech infusions/year

Flight



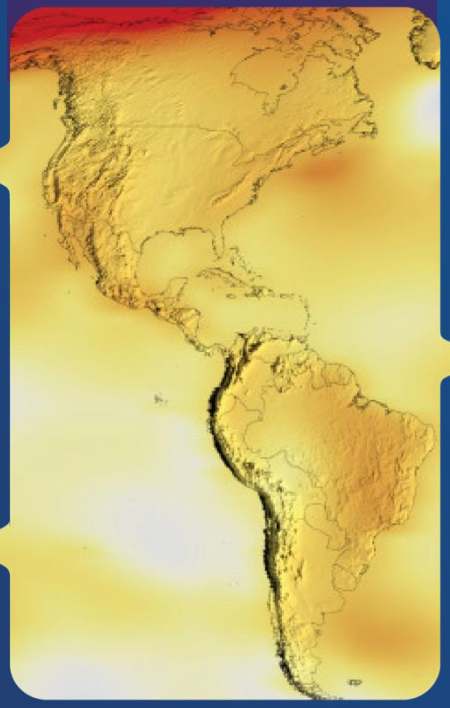
24 missions on orbit

Data and Modeling



Collect 160 TB/Day, serving 600 TB/Day, >10M users of world-class models

Research



Over 1,300 active research projects across the USA

Earth Action

Agriculture, Energy, Disasters, Wildfires, Health/AQ, & more

Earth Action Strategy

Drive U.S. economic growth: Help U.S. businesses, from farms to the space economy, use Earth data to compete and innovate

Equip leaders to act: Deliver trusted data and tools to local, state, and federal partners to increase resilience, security, and prosperity

Accelerate AI for Earth: Apply AI to widen access to Earth data and speed insight

Strengthen American resilience to hazards: Target fire, flood, drought, heat, and health threats

Scale what works: Support efficient solutions that work across regions and missions

Stay adaptive: Build programs that adjust as budgets, risks, and national priorities evolve

NASA earth ACTION

Agriculture

EarthRISE

Energy & Infrastructure

Water Resources

Disasters

Ecological Conservation

Health & Air Quality

Wildland Fires

Earth Information Center

Interagency Satellite Observation Needs

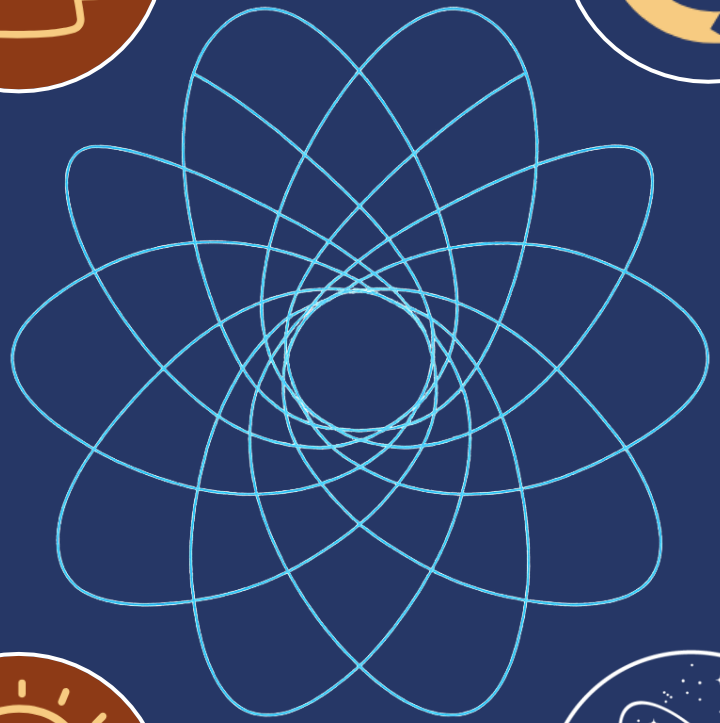
Private Sector Engagement

Commercial Satellite Data Acquisition

We are a part of an **ecosystem**

Users & Decision-makers
Fed, state & local gov, general public, private sector, & others

Private Sector LLMs/GeoAI, Consultancies, and Value-added Data Services



Commercial Satellite Data Providers

Other public EO providers

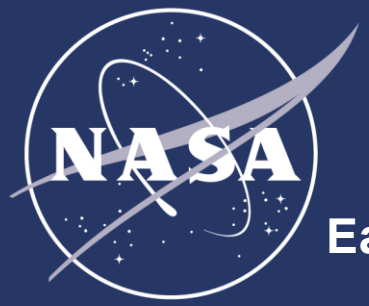
USGS science for a changing world

NOAA

esa

Copernicus Europe's eyes on Earth

Researchers and Applications developers

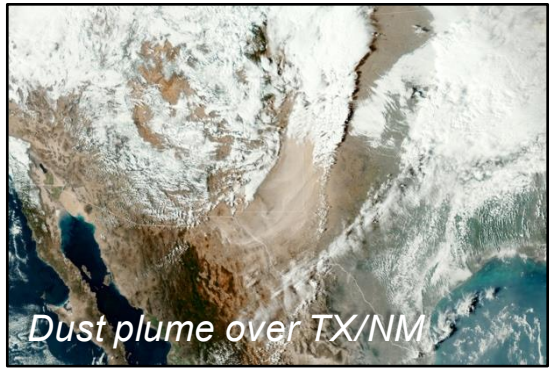


NASA Earth Science

NASA Health and Air Quality Applications

We support the use of Earth observation data in air quality management and public health applications to protect and enhance health, security, and the economy in the areas of:

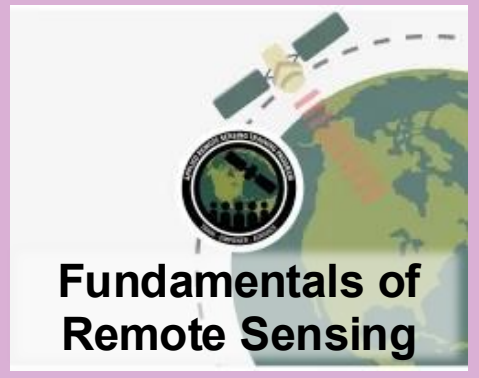
- Infectious diseases and environmental health
- Toxic and pathogenic exposures and health-related hazards
- Implementation of air quality standards, policies, and regulations
- Effects of climate change on public health and air quality



Major Partners include International (e.g., GEO, UNICEF), Federal (e.g., CDC, EPA, NIH, NOAA), State (e.g., South Dakota, California, Texas), and Private sectors (e.g., Google, Moore Foundation).

NASA Applied Remote Sensing Training Program (ARSET)

Courses with **lectures** and **hands-on guided computer exercises** on how to access, interpret, and use NASA satellite images for decision-support



GEO GROUP ON EARTH OBSERVATIONS

GEO HEALTH COMMUNITY OF PRACTICE

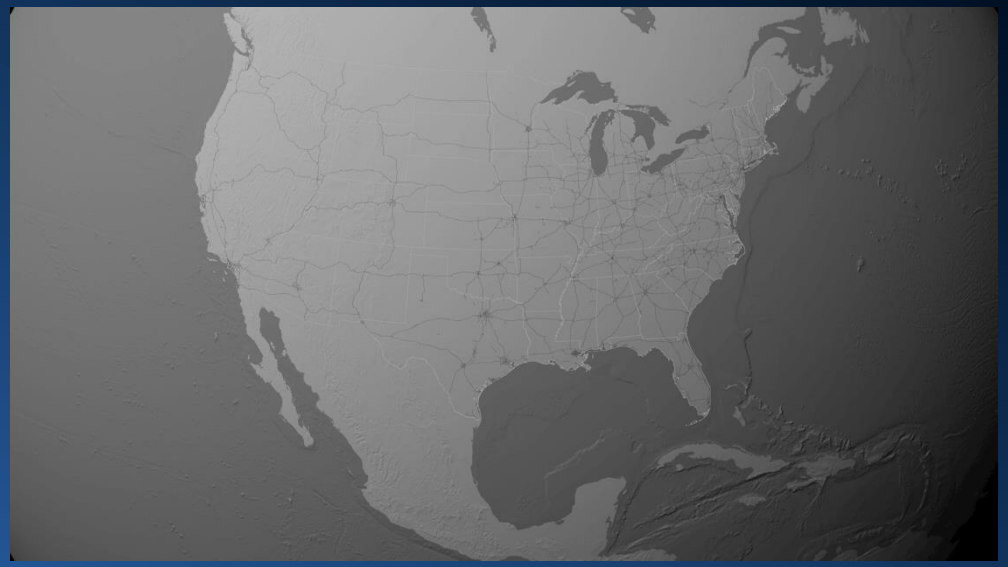
Improving Health Decision-Making Using Environmental Observations

Global network of governments, organizations, and observers, who seek to use Earth observation data to improve health decision-making at the international, regional, country, and district levels

Work Groups	
Heat	Infectious Diseases
Air Quality	Animal Health
Food Security & Safety	Health Care Infrastructure

https://www.geohealthcop.org/

Tropospheric Emissions: Monitoring of Pollution



Launched in 2023, TEMPO (geostationary orbit) collects UV/visible hyperspectral measurements of major pollutants (NO_2, HCHO, O_3) every daylight hour at suburban spatial scales across North America.

Data are helping advance air quality monitoring over urban and agricultural areas, traffic corridors, industrial facilities, wildland fires, and dust storms.

https://science.nasa.gov/mission/tempo/

MAIA
Multi-Angle Imager for Aerosols

The MAIA mission represents the first partnership between NASA and epidemiologists and health organizations on a satellite mission to study human health.
MAIA will integrate satellite observations ($PM_{2.5}$), surface monitor data, chemical transport model outputs, and health records to examine the impacts of chemically speciated PM on human health over globally distributed Primary Target Areas.

https://maia.jpl.nasa.gov

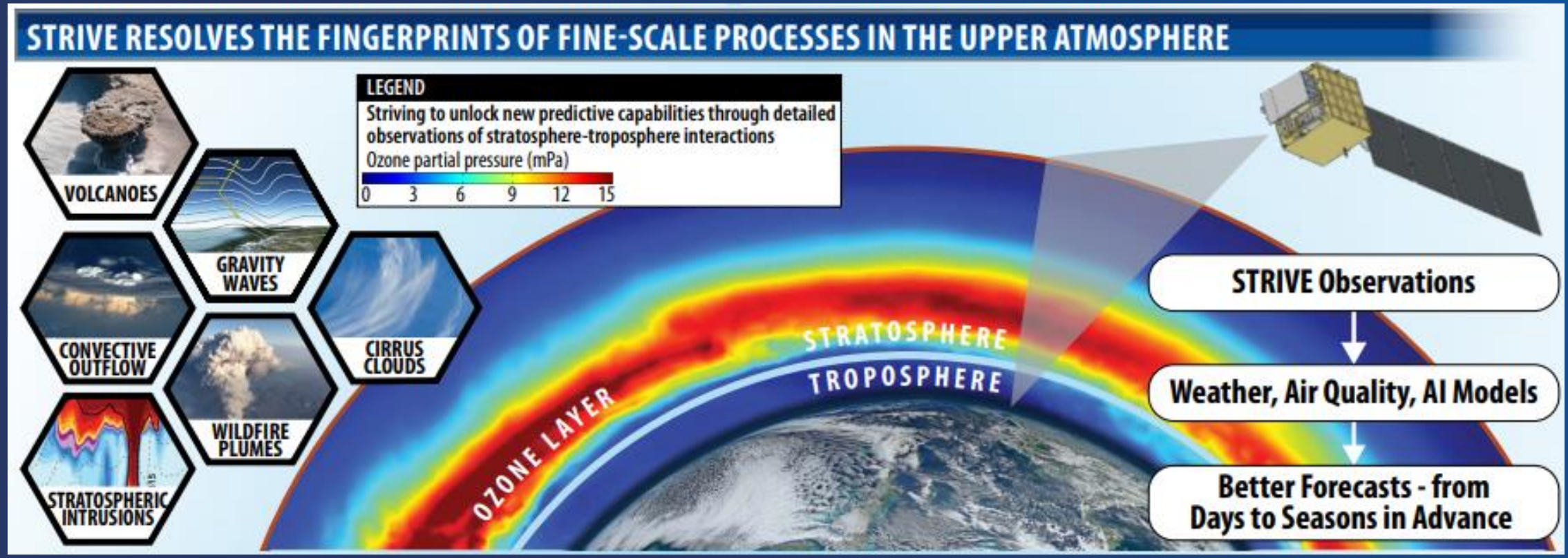
Jet Propulsion Laboratory
California Institute of Technology

Agenzia Spaziale Italiana

STRIVE: Opening a New Window on Stratosphere-Troposphere Interactions

Competed Explorer Class Mission (UW/GSFC)

STRIVE (Stratosphere Troposphere Response using Infrared Vertically-resolved light Explorer) will deliver an unprecedented view of the atmosphere, transforming our understanding and enabling a leap in the accuracy of atmospheric predictions including weather patterns, extreme events, air quality, and the future of the ozone layer.



NASA Health and Air Quality Community Awardees

Helena Chapman Wins an Earthie!

Dr. Helena Chapman (NASA HQ/BAH) serves as the Associate Program Manager of the Health and Air Quality (HAQ) Program and Executive Coordinator of the GEO Health Community of Practice. She brings her scientific expertise in medicine, epidemiology, environmental health, and One Health, keen insights into data user challenges and needs, Spanish fluency, and strong organizational skills to HAQ, HAQAST, and the CoP. Helena has worked tirelessly to enable public agencies, professional societies, and private companies to use data from NASA's Earth-observing satellites for practical purposes in environmental health and infectious disease. She has demonstrated passion, perseverance, and innovative leadership to identify opportunities that expand the use of Earth observations to end-user communities of health researchers and practitioners. She was recognized with the 2025 ESD Peer Excellence Award ("Earthie") in February 2026.

"For outstanding service to NASA and partners in advancing innovative and practical uses of Earth Science observations for improving public health decision-making."
– John Haynes, Program Manager, Health and Air Quality Applications

Jim Szykman Wins "Service to America" Medal

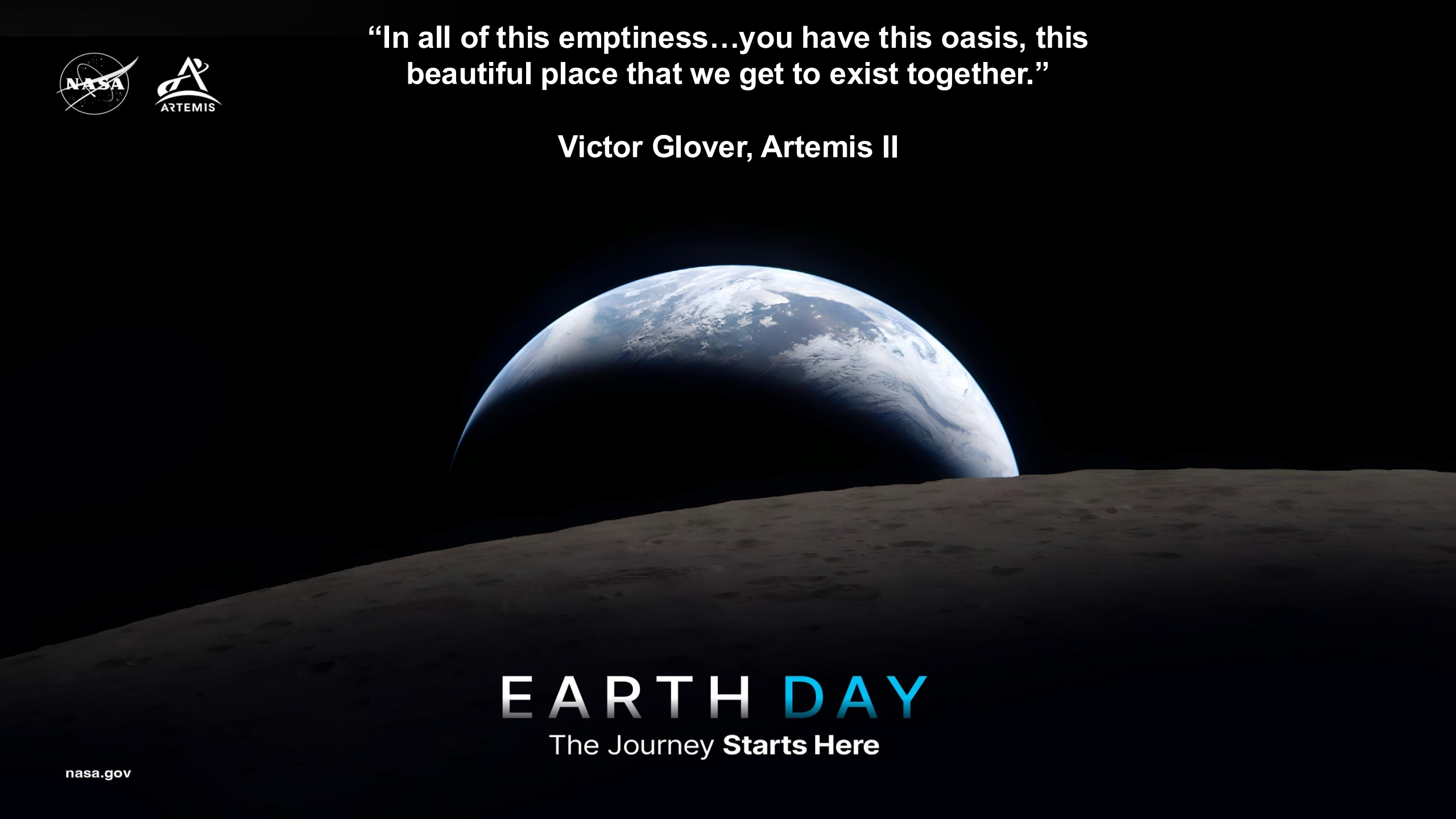
The 2023 launch of NASA's TEMPO mission fulfilled a decades-long vision by providing revolutionary data that is transforming our understanding and prediction of air quality and physical effects on climate.

Its rapid success and incorporation into air quality research is due in large part to **James Szykman**, a senior research engineer at the **Environmental Protection Agency**, who led years of preparatory on-the-ground work to ensure the new data delivered by TEMPO could properly inform air quality management at the federal, state and local level to meaningfully address air pollution.

Since 1999, Szykman has been on assignment at NASA's Langley Research Center with a focus on building stronger and more efficient science collaborations between EPA and NASA. Working closely with NASA scientists, he has successfully developed a seamless connection to translate satellite data into the agency's air quality research and results that can be applied to all levels of government as well as commercial industry.

“In all of this emptiness…you have this oasis, this beautiful place that we get to exist together.”

Victor Glover, Artemis II



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