

National Aeronautics and
Space Administration



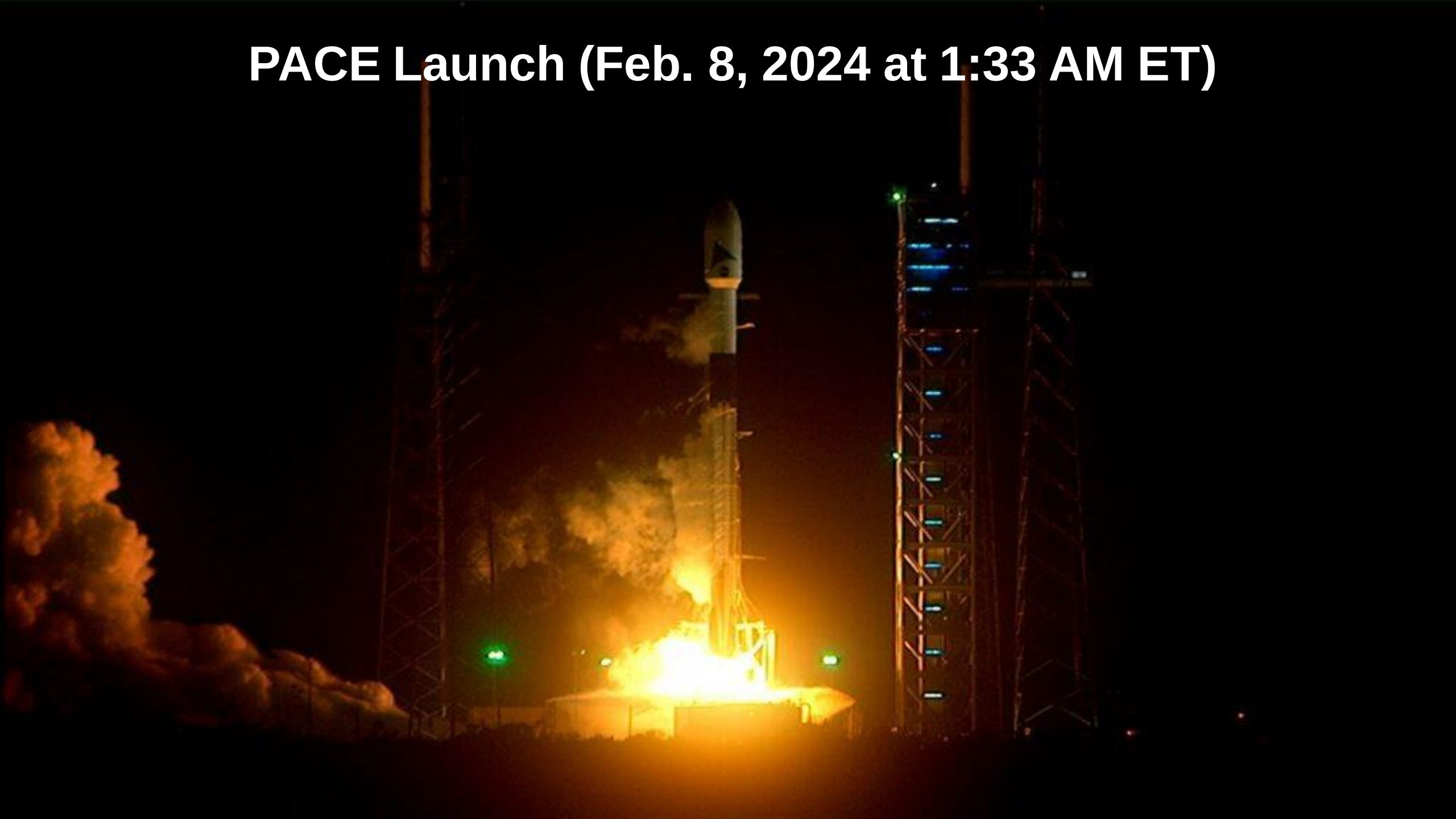
EXPLORE EARTH

John Haynes, MS
Earth Action Program
Earth Science Division
NASA Headquarters

HAQAST Massachusetts: Update
from the NASA Health and Air
Quality Applications Program

June 4, 2024

PACE Launch (Feb. 8, 2024 at 1:33 AM ET)



First PREFIRE Launch (May 25, 2024 at 7:41 PM NZST)





EARTH FLEET

Key

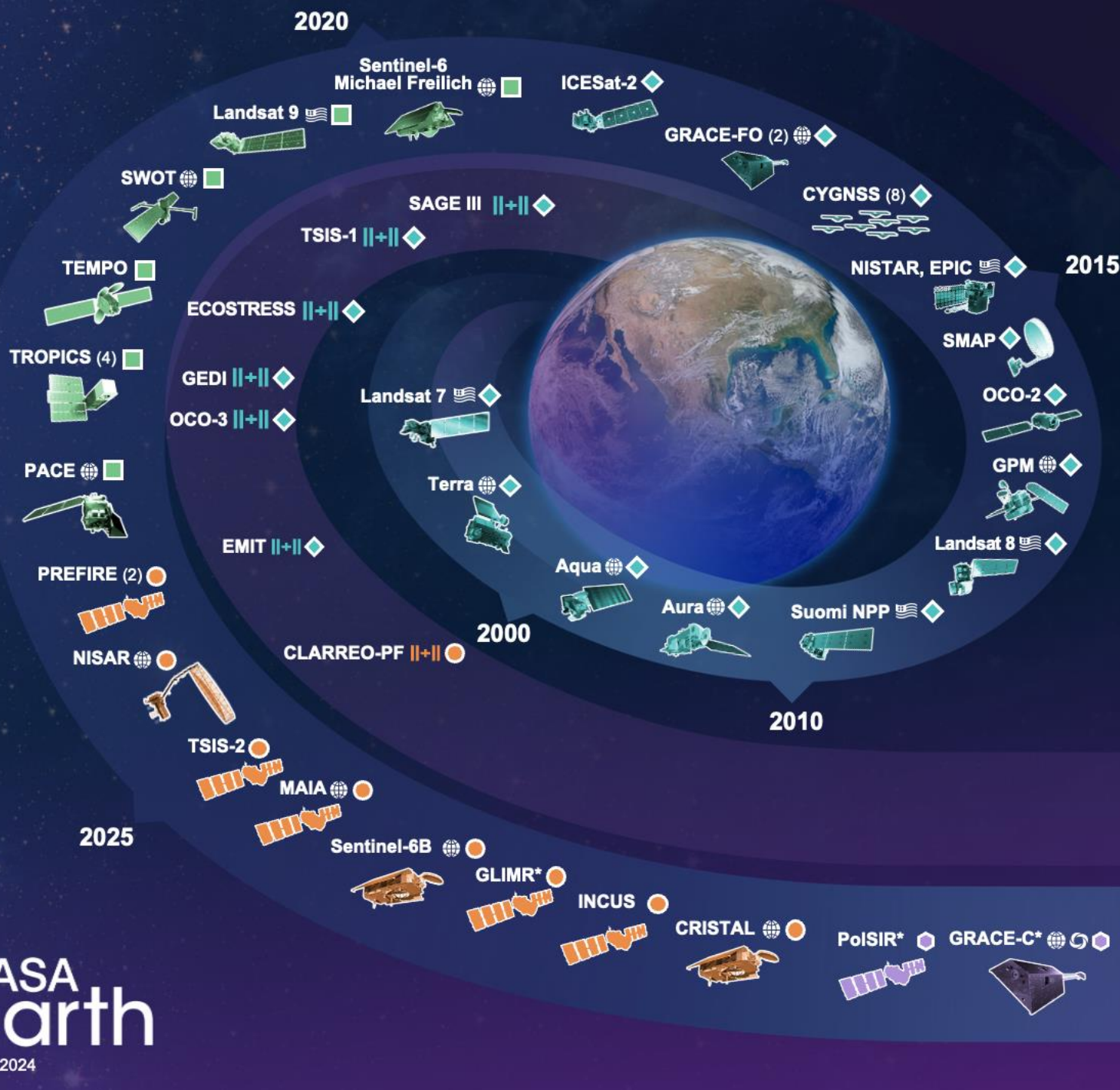
- International Partners
- U.S. Partner
- ISS Instrument
- JPSS Instrument
- Cubesat
- Launch Date TBD
- Earth System
- Observatory Mission
- (Pre) Formulation
- Implementation
- Operating
- Extended

Invest/CubeSats

- NACHOS 2022
- CTIM 2022
- NACHOS-2 2022
- MURI-FD 2023
- SNOOPi* 2024
- HYTI* 2024
- ARGOS* 2024

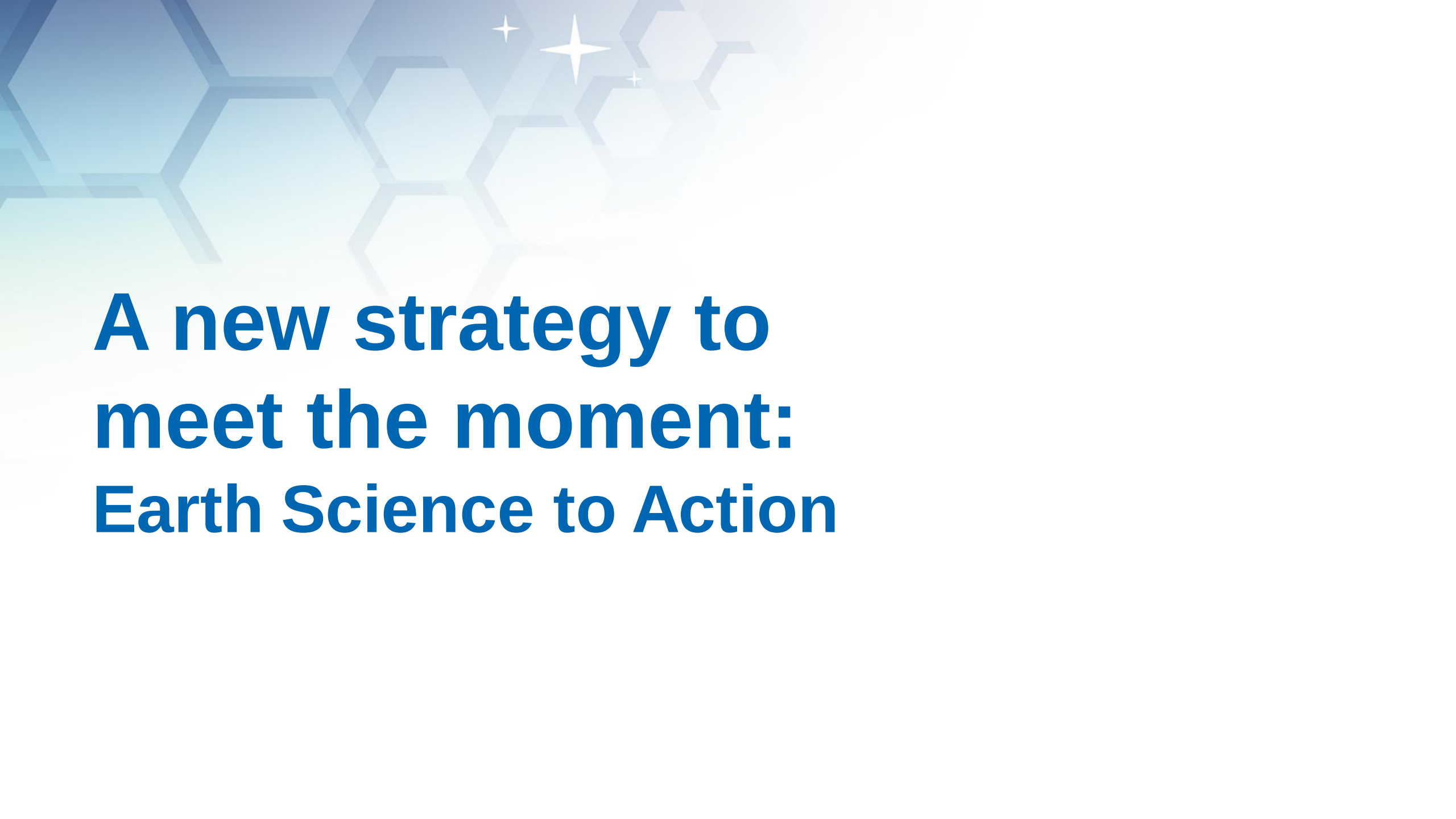
JPSS Instruments

- OMPS-LIMB 2022
- LIBERA 2027
- OMPS-LIMB 2027
- OMPS-LIMB 2032



ISS INSTRUMENTS

MISSIONS



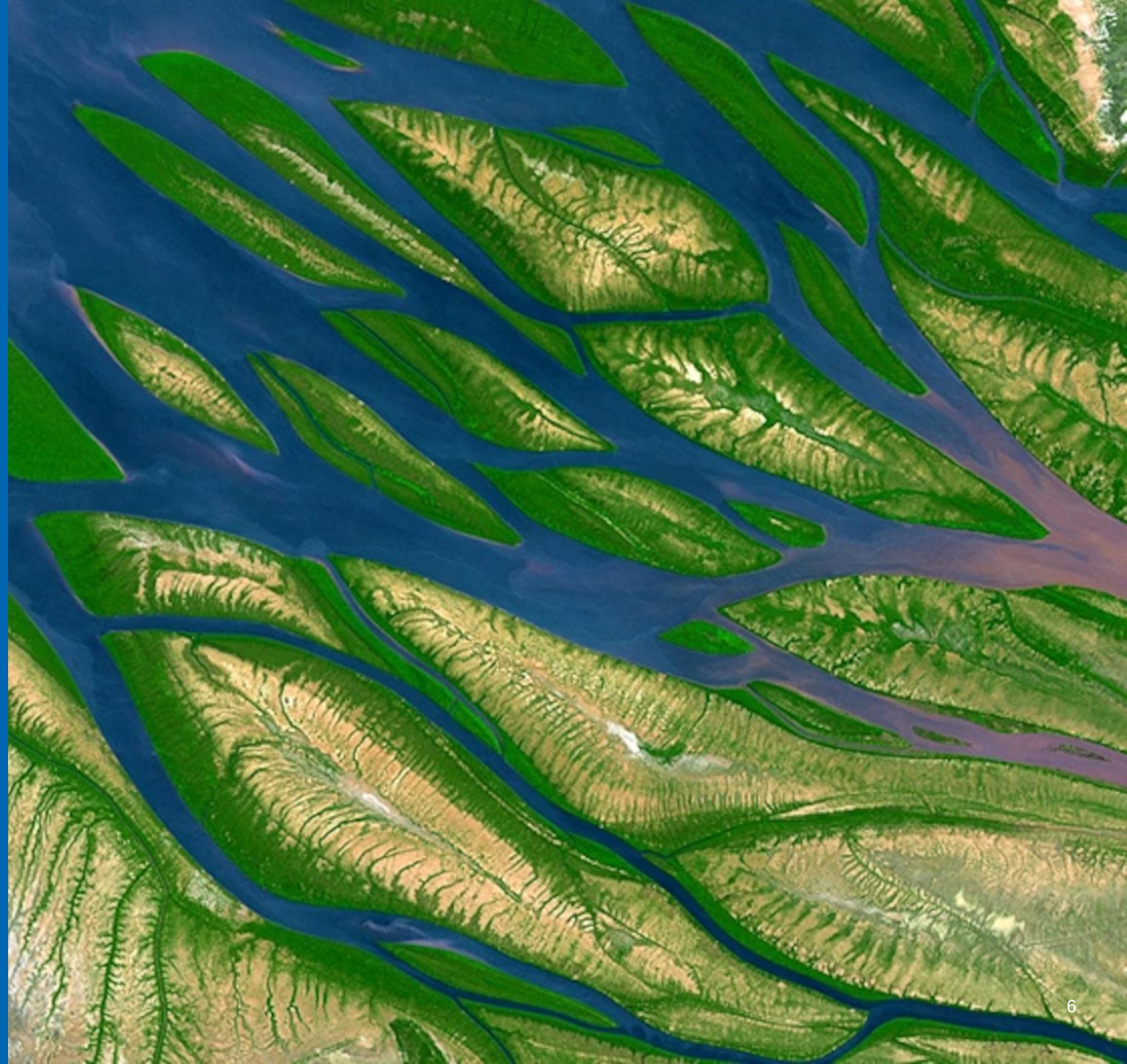
A new strategy to meet the moment: Earth Science to Action

OUR VISION

A thriving world, driven by
trusted, actionable Earth
science

OUR MISSION

Compelled by our planet's rapid
change, we innovate and
collaborate to explore and
understand the Earth system,
make new discoveries, and enable
solutions for the benefit of all

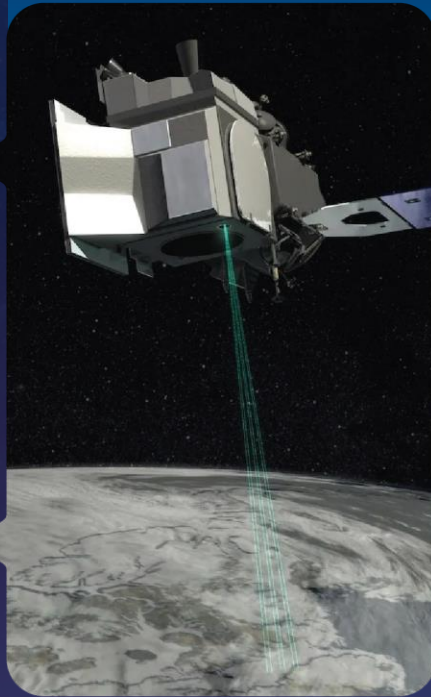


Advancing Earth System Science End-to-end

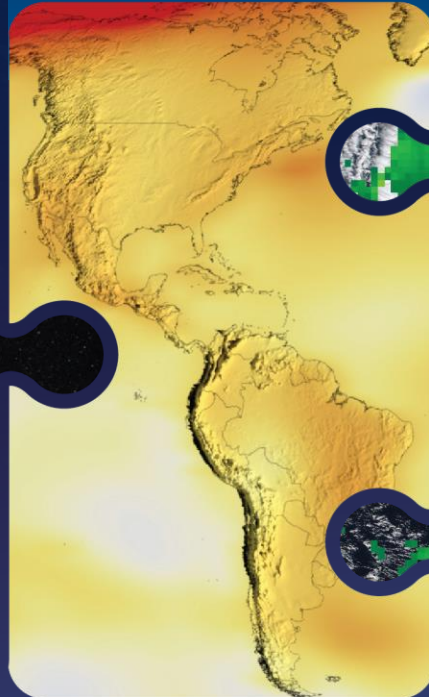
Technology



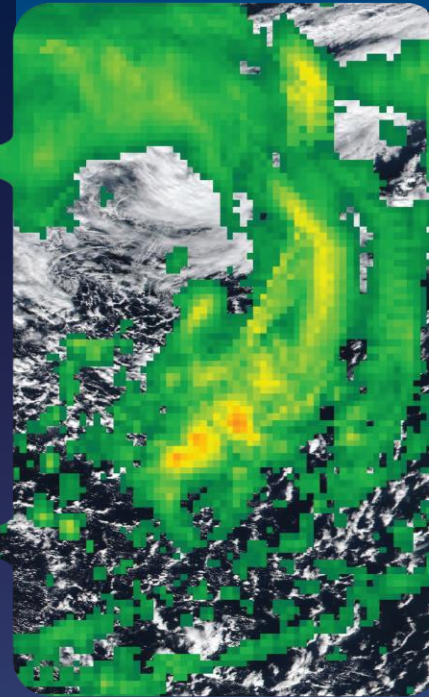
Flight



Research and Analysis



Data and Modeling



Earth Action



What do we mean by “action”?

Our definition of action is accelerating the use of Earth science to support policy and decision-making for society's well-being

- **Scale up:** Scale up existing efforts to get NASA science and data into hands of end users to solve real-world challenges
- **Build bridges:**
 - Build structural and cultural bridges between research, technology, flight, data, and Earth action elements
 - Identify and remove barriers to collaboration
- **Be user centered:** Prioritize info exchange with end users to allow their experiences to inform future programs



Are we cutting the research budget to do this?

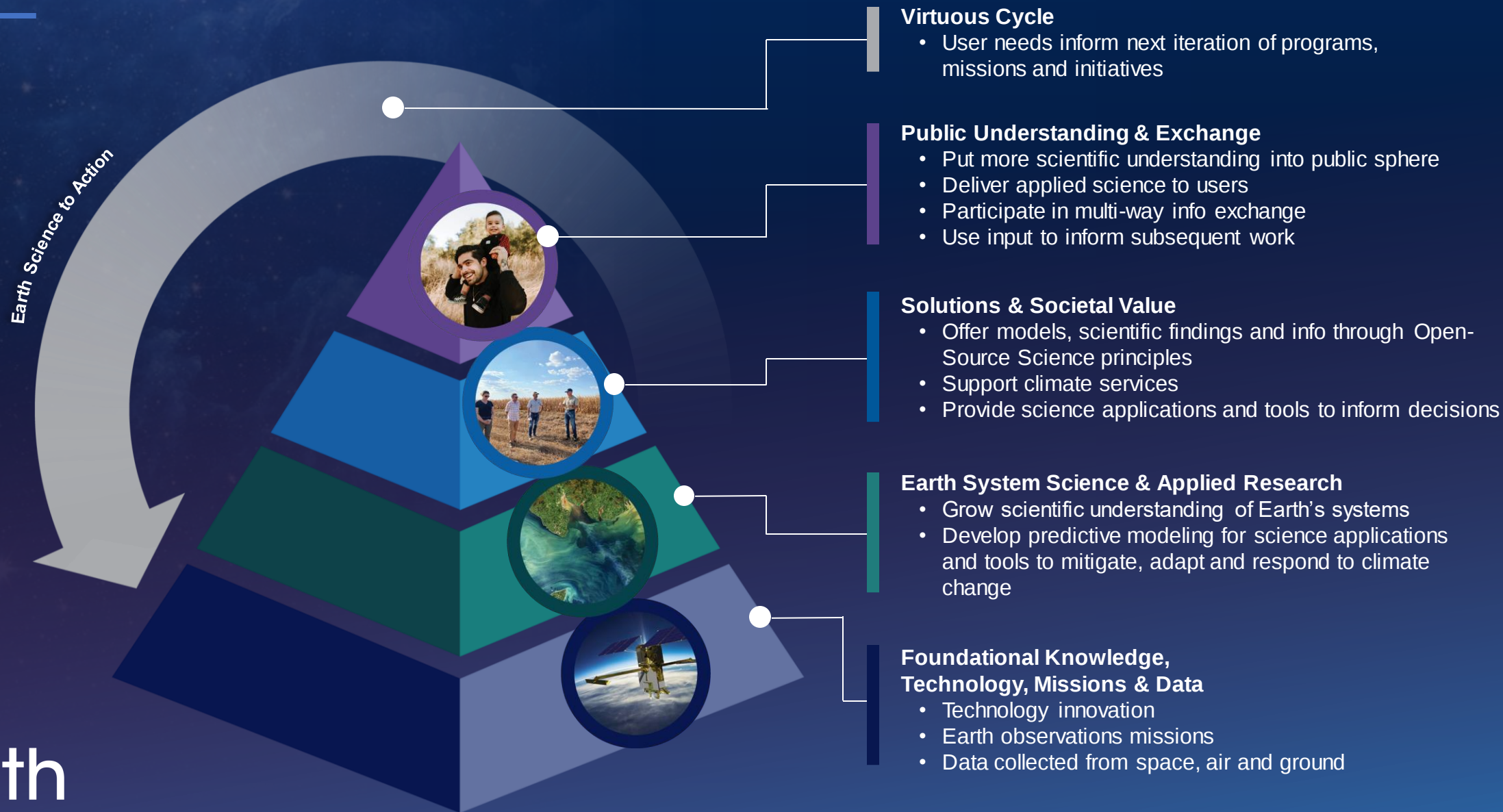
○ No! The strategy does not call for defunding some efforts to start others. Work to implement this strategy will take place across all elements.

- R&A is a critical part of the strategy
- In some parts of ESD, implementation will be shared between R&A and Earth Action elements
- The overall goal is to realign responsibilities to enable deeper integration

The right side of the slide features a large, stylized graphic of the Earth. It shows a satellite view of a coastline with intricate patterns of land and water. The colors are vibrant, with deep blues for the ocean and various shades of green, brown, and tan for the land. Overlaid on this image is the text "NASA earth" in a white, sans-serif font. "NASA" is in all caps and "earth" is in lowercase. The text is positioned in the upper right quadrant of the image.

NASA
earth

Earth Science to Action Strategy



EARTH ACTION PROGRAM

Mission

Enable people & organizations to apply insights from Earth science to benefit the economy, health, quality of life, and environment.

What We Do

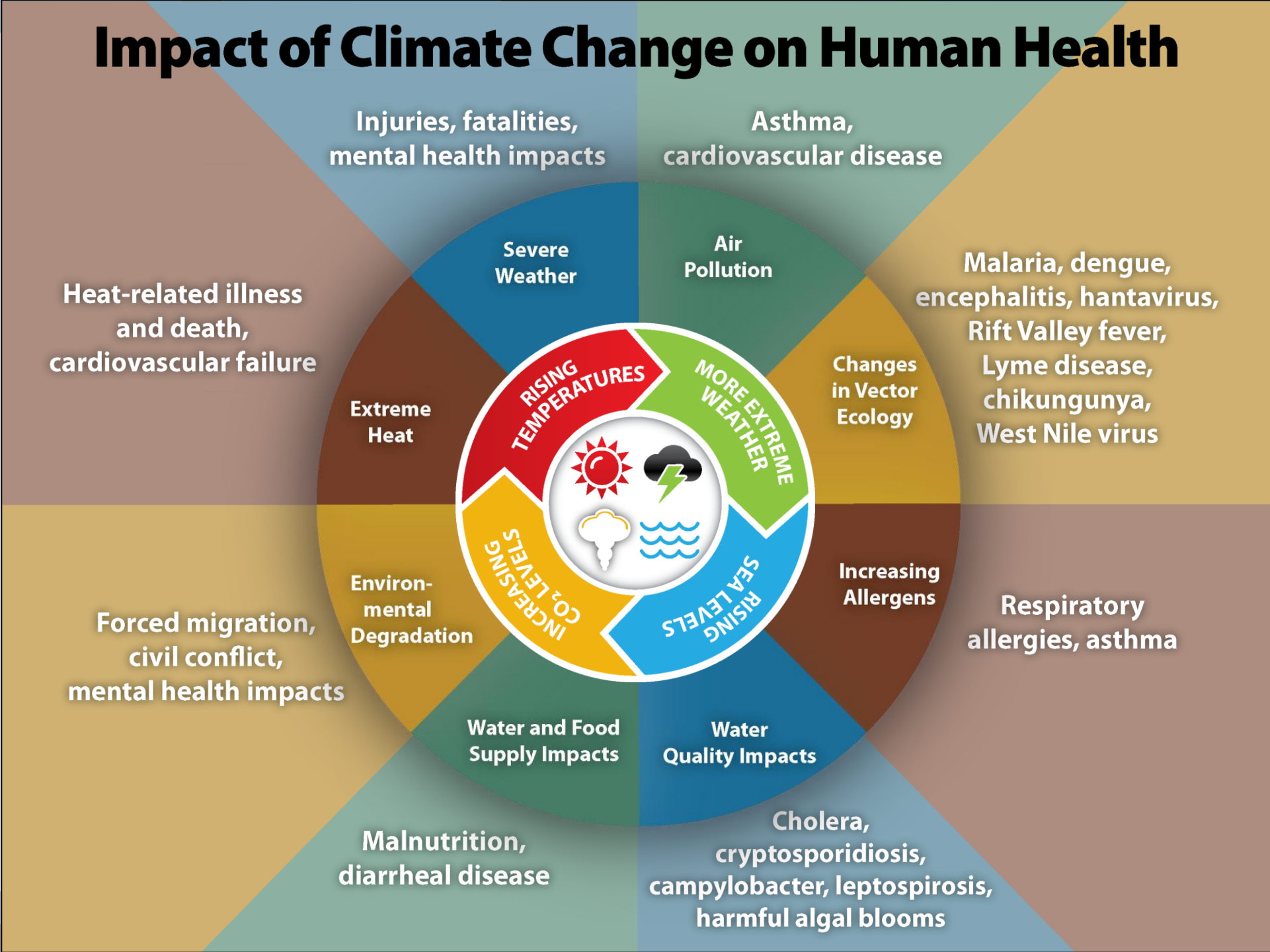
We make financial and programmatic investments to generate creative solutions and lower the technical and institutional barriers to using Earth science information

- Work with organizations to improve their decisions and actions
- Draw on our connections with users to bring their feedback and inquiries back to ESD



*Scalability
Building Bridges
User-Centric Solutions*

Impact of Climate Change on Human Health



NASA Health & Air Quality Applications Objectives:

We support the use of Earth observations in air quality management and public health, particularly regarding...

- **Infectious disease and environmental health**
- **Toxic and pathogenic exposure and health-related hazards**
- **Implementation of air quality standards, policy, and regulations**
- **Effects of climate change on public health and air quality**



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

Other Items of Note

- Slow response from NSSC on placing grants/augmentations.
- Remember Final Reports are due 90 days **after** your POP end date.
- HAQAST Rapid Response project announcement in May – only one project could be funded at this time.
- NASA received its full FY24 appropriation; however, ESD funding was less than the PBR for FY24. HAQ absorbed a reduction of approximately 8%. This reduction had to be taken out of reserves for HAQAST Rapid Response.
- High-level interest from leadership on poor costing.
- ROSES 2024 solicitations on the street for HAQ (A.43, Due 8/6/24) and HAQAST (A.44, Due 7/9/2024).
- Renewed MOU Annex with CDC/EPHTN.
- Launch of virtual NASA Earth Information Center (<https://earth.gov/>).
- 2024 NASA HAQ Annual Team Meeting held in Jackson, WY on April 23-24, 2024.
- Sessions at AGU (inc. AGU Chapman Conference), AMS, AMCA, SXSW, ATS – along with presentations at the World Medical Association and with various universities and stakeholders.
- Asia-AQ Field Campaign in Winter/Spring 2024.
- SCOAPE-II Field Campaign in Summer 2024.
- AWMA in Calgary – June 24-27.
- TEMPO-GEMS ST Meeting (Hawaii) – August 26-30.
- AmeriGEO Week (Ecuador) – August 26-30.
- APHA in Minneapolis – October 27-30.

FY25 ESD President's Budget Request by Program

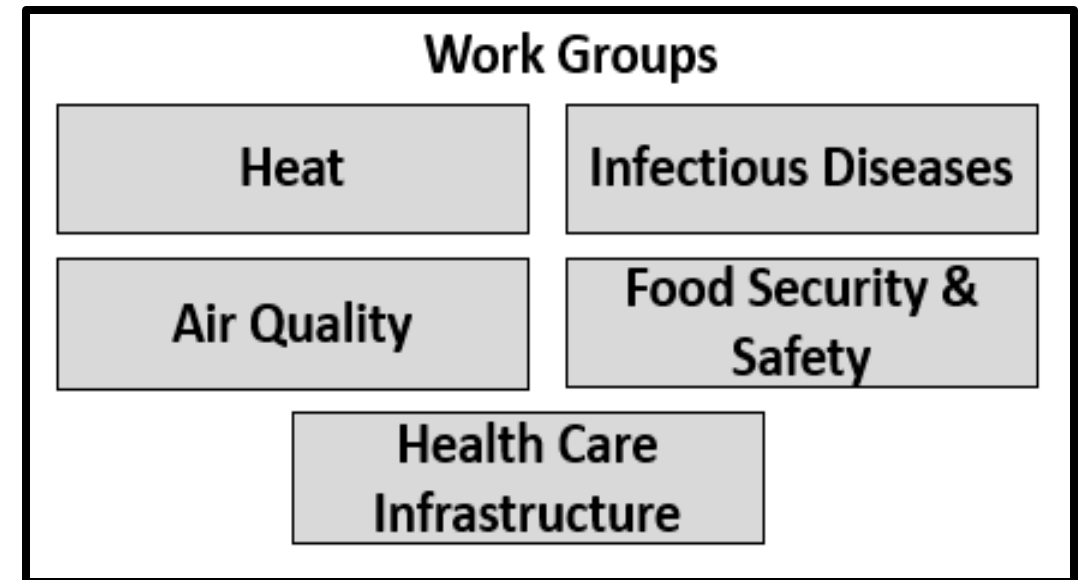
(\$K)	Actual	Plan	Request	Outyears			
	FY23	FY24	FY25	FY26	FY27	FY28	FY29
Total Earth Science	2,194,000	2,251,635	2,378,651	2,396,300	2,446,100	2,489,700	2,543,400
Earth Systematic Missions	914,956	771,336	854,432	868,694	888,155	869,878	757,827
Earth System Science Pathfinder	232,116	245,474	251,726	245,979	202,066	224,988	308,934
Earth System Explorers	2,459	22,064	19,581	58,969	99,491	130,638	194,710
Earth Science Data Systems	365,087	392,341	263,236	257,569	268,340	269,798	276,340
Earth Science Technology	102,181	105,349	147,248	109,392	110,596	111,812	113,040
Applied Sciences	75,205	87,560	68,591	73,344	73,470	75,804	75,901
Earth Science Research	501,996	627,511	606,152	608,425	627,558	628,848	637,188
Responsive Science Initiatives	-	-	167,685	173,928	176,424	177,934	179,460



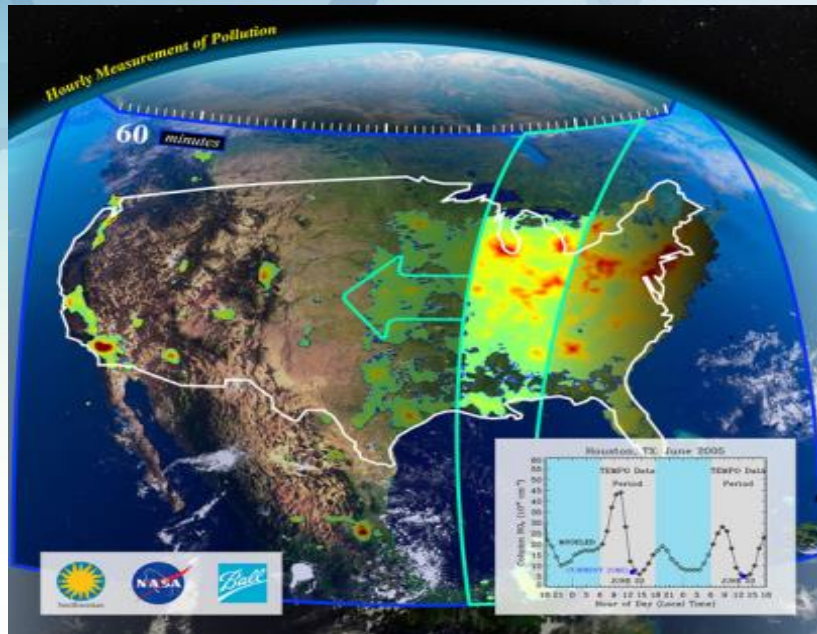
Improving Health Decision-Making Using Environmental Observations

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

Community Teleconferences
AGU Fall Meeting (USA)
GEO Symposium & Week
AmeriGEO Week



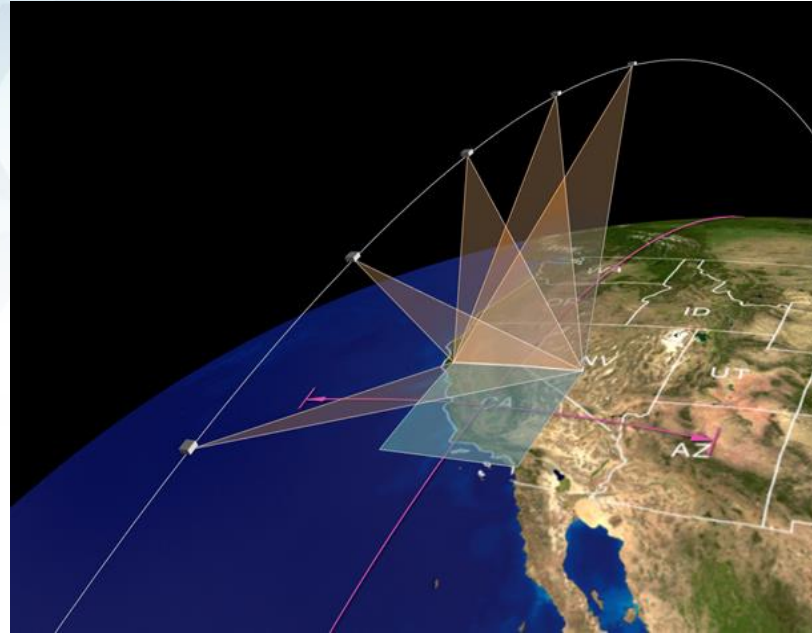
Earth Venture Instrument-1: Tropospheric Emissions: Monitoring of Pollution (TEMPO)



“Monitoring the air we breathe, hour by hour”
Credits: TEMPO website

- ❖ **TEMPO is a pathfinder to using hosted commercial payloads from GEO.**
- ❖ Collects tropospheric pollution observations from geostationary orbit: Ozone, NO_2 , CH_2O .
- ❖ Forms a global air quality constellation in GEO with Copernicus Sentinel 4 and Korean GEMS.
- ❖ Instrument delivered in 2018; Launched April 2023; First Light August 24, 2023. First public products May 20, 2024.

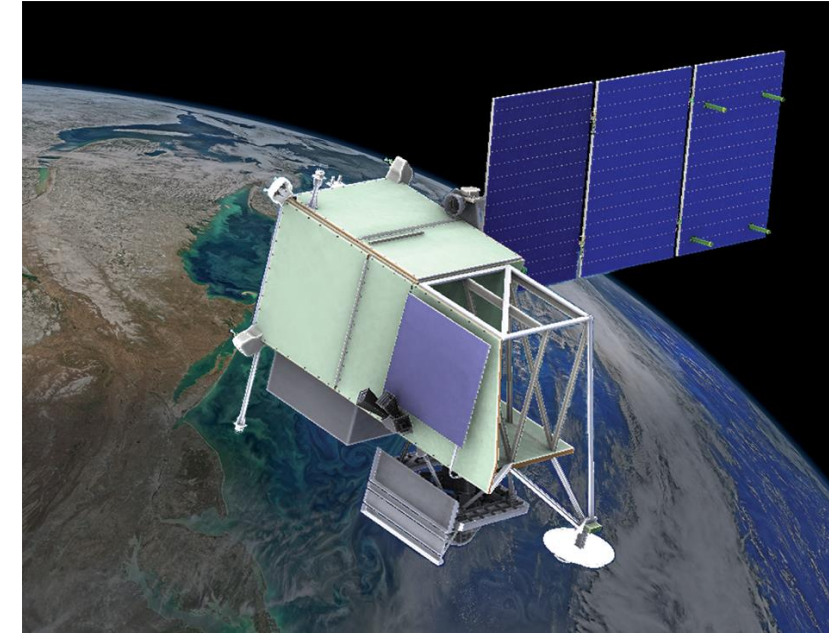
Earth Venture Instrument-3: Multi-Angle Imager for Aerosols (MAIA)



Credits: MAIA website

- ❖ **MAIA represents a sentinel partnership between NASA and epidemiologists/health organizations on a satellite mission.**
- ❖ Assesses linkages between different airborne PM types and adverse birth outcomes, cardiovascular and respiratory disease, and premature deaths.
- ❖ Will measure particle types, sizes, concentrations, and geolocation of atmospheric aerosols.
- ❖ New PTAs in Korea and Santiago.
- ❖ Launch expected 2025.

Plankton, Aerosol, Cloud, ocean Ecosystem (PACE)



Credits: PACE website

- ❖ **PACE's Ocean Color instrument will be the most advanced for observing ocean color in NASA's history.**
- ❖ Assesses ocean color, aerosol, and cloud data records for Earth system and climate studies.
- ❖ Multi-angle polarimeter to measure the particle sizes and compositions of atmospheric aerosols and ocean color.
- ❖ Launched February 2024. First light April 11, 2024.



Questions:

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<http://AppliedSciences.NASA.gov>

National Aeronautics and
Space Administration

