

An aerial photograph of a river delta, showing a complex network of channels and distributaries. The water is a deep blue, and the surrounding land is a mix of green and brown, indicating different vegetation and terrain. A large, semi-transparent blue shape is overlaid on the image, partially covering the river and the land. The text is centered within this blue area.

# What is Our Earth Science to Action Strategy?

**Woody Turner and Keith Gaddis**

**NASA Biodiversity and Ecological Conservation  
Team Meeting**

**Hotel Silver Spring, Silver Spring, MD**

**May 8, 2024**

# Earth Science to Action: the basics

The Earth Science to Action strategy is the Earth Science Division's 2024-2034 strategic plan. This strategy is our plan of action designed to achieve our vision, mission and strategic goals.

- ESD's response to 2018 Decadal Survey and other national priorities
- Drives next iteration of programs, missions, initiatives, **solicitations**
- Informs budget approach
- Informs employee performance expectations



NASA  
earth

**We are at a pivotal  
moment**



**Urgency**

**Responsibility**

**Leadership**



# STRATEGIC GOAL

Within a decade, we will advance and integrate Earth science knowledge to empower humanity to create a more resilient world.





# Objective 1

Holistically observe, monitor and understand the Earth system

**Key Result 1.1:** The most advanced Earth observing system in the world

**Key Result 1.2:** Cutting-edge technology

**Key Result 1.3:** Integrated and trusted Earth system data

**Key Result 1.4:** Scientific breakthroughs to better understand Earth



## Objective 2

○ Deliver trusted information to drive Earth resilience activities

**Key Result 2.1:** Models that capture the intricacies of the Earth system

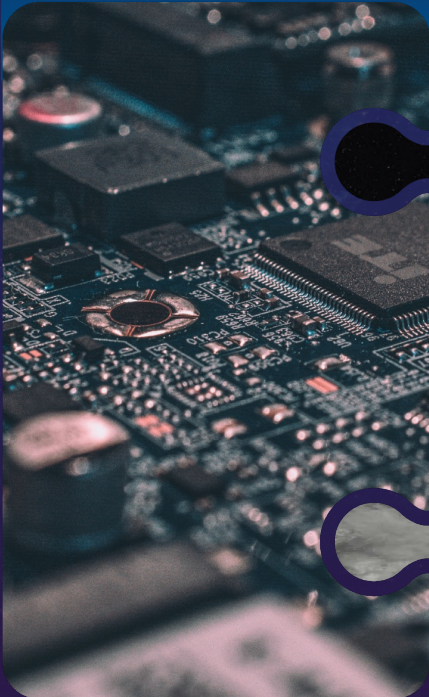
**Key Result 2.2:** Co-designed solutions and tools to support users

**Key Result 2.3:** Science-based information we can trust and act on

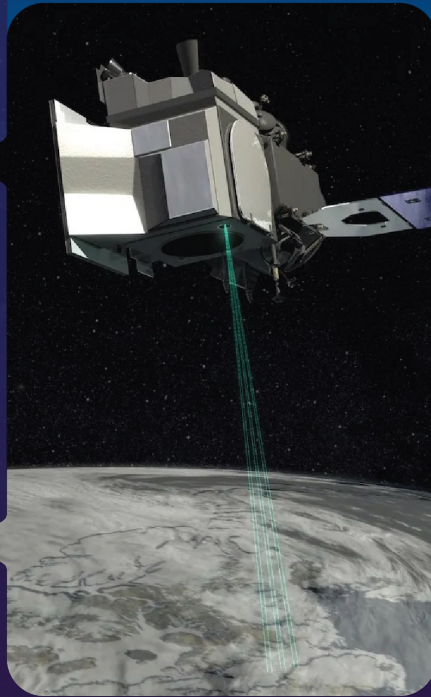
**Key Result 2.4:** Promotion of Earth information as a national asset

# Earth Science: who's included

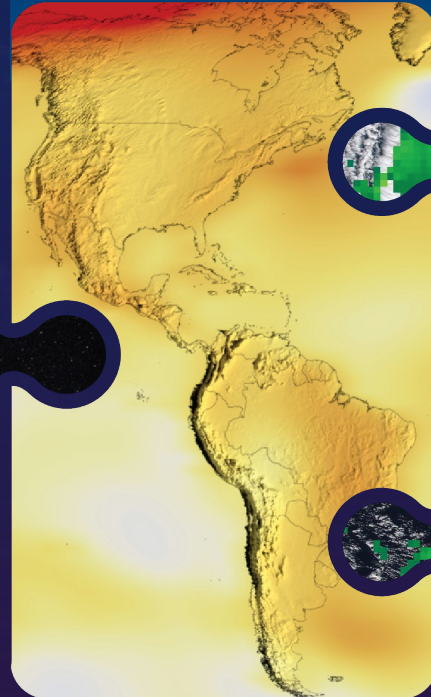
Technology



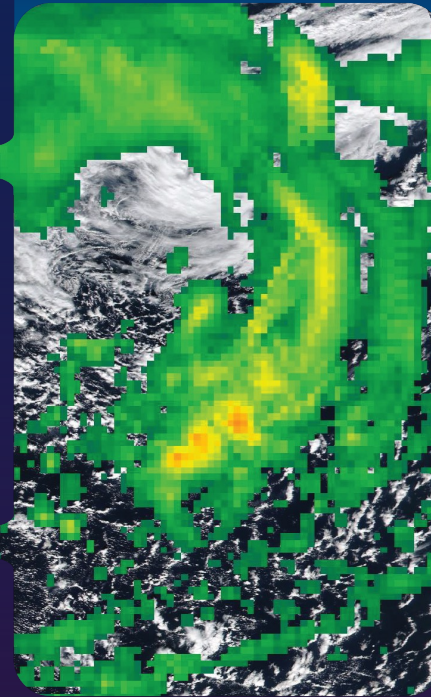
Flight



Research and Analysis



Data and Compute



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

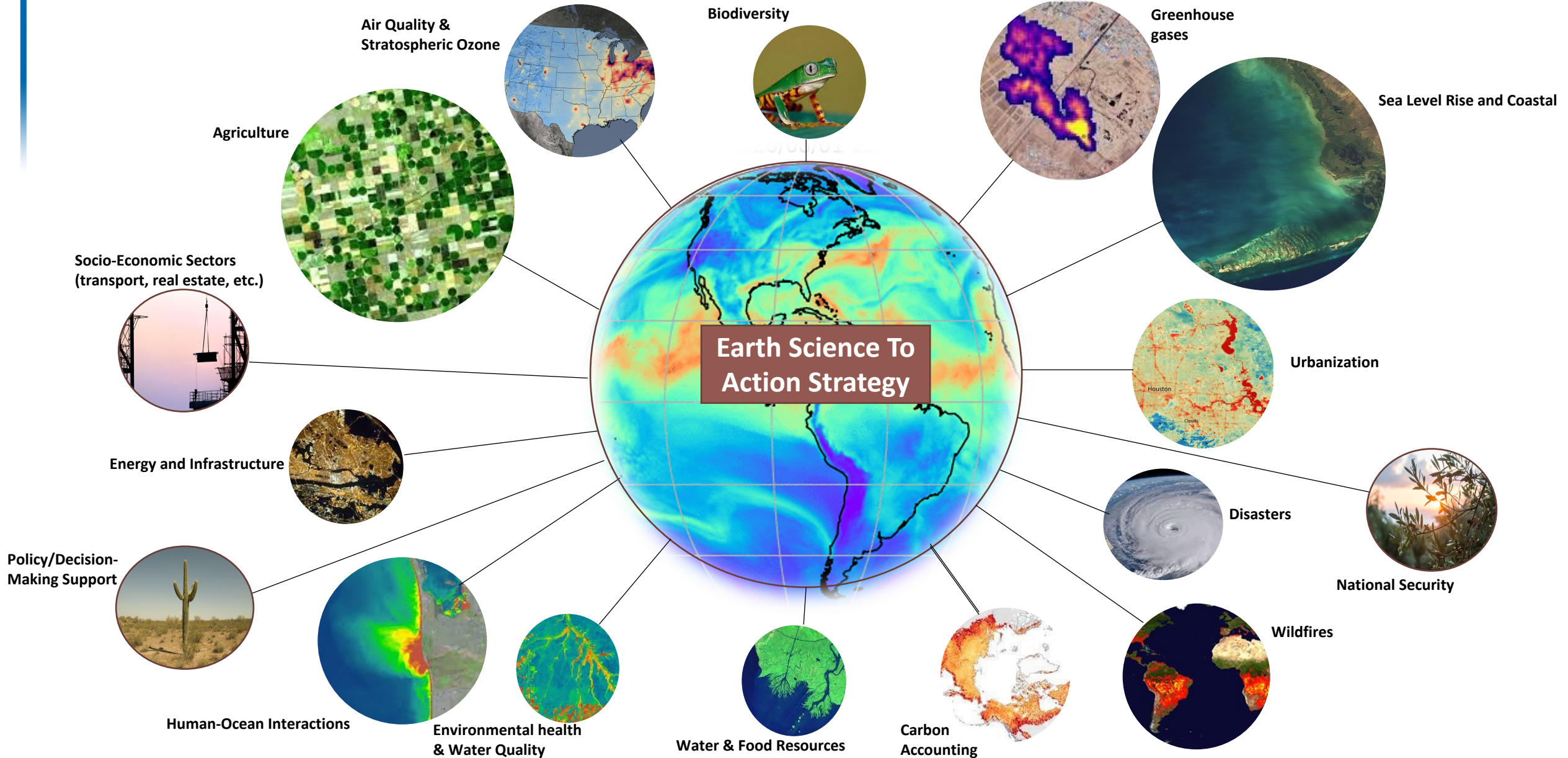
## The Three Pillars of Earth Action:

- **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



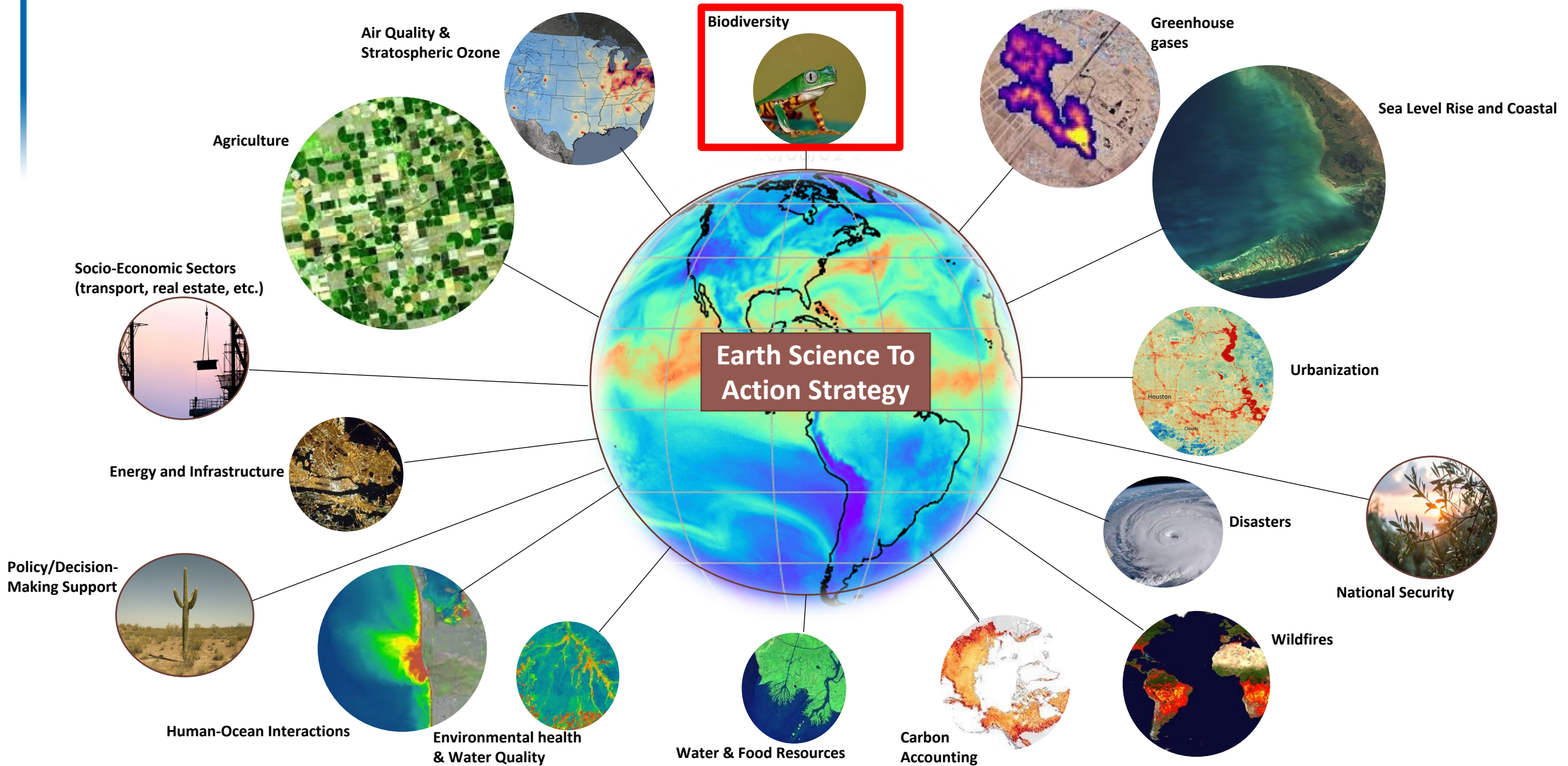
# Focus Areas

The strategy identifies 16 systems that sustain well being of humanity:



# Success!

We're on the board!



# OK. So, what is ES2A for Biodiversity Conservation?

At our 2018 and 2019 Team meetings, we defined the programmatic commitments for the Biological Diversity Program and Ecological Conservation (then Forecasting) Program as follows.

## **Biological Diversity Program**

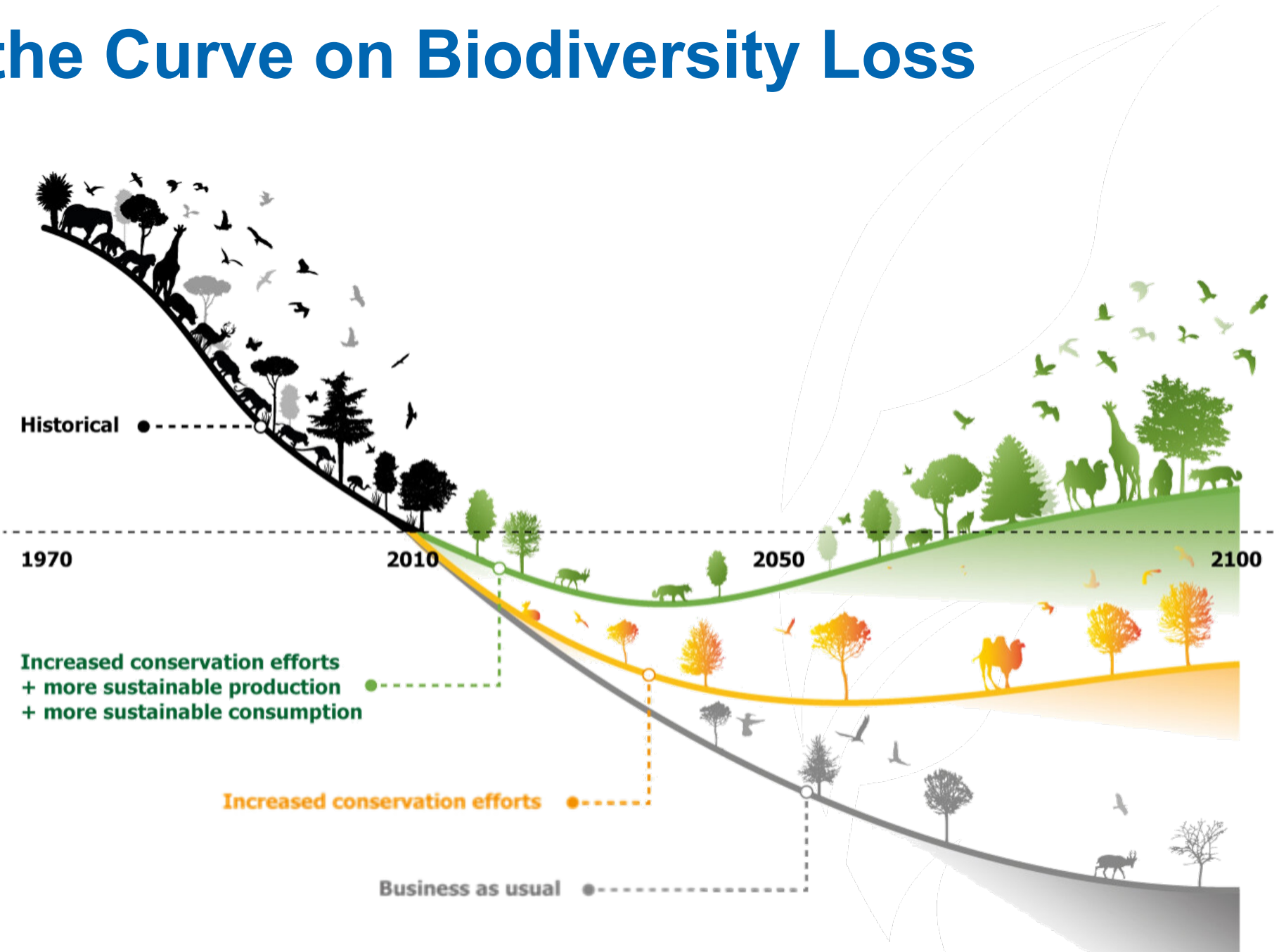
- **Understanding Life on Earth**

## **Ecological Conservation Program**

- **Saving Life on Earth**

**How do we better link a question-based research focus to the development of decision support tools for real-world users?**

# Bending the Curve on Biodiversity Loss

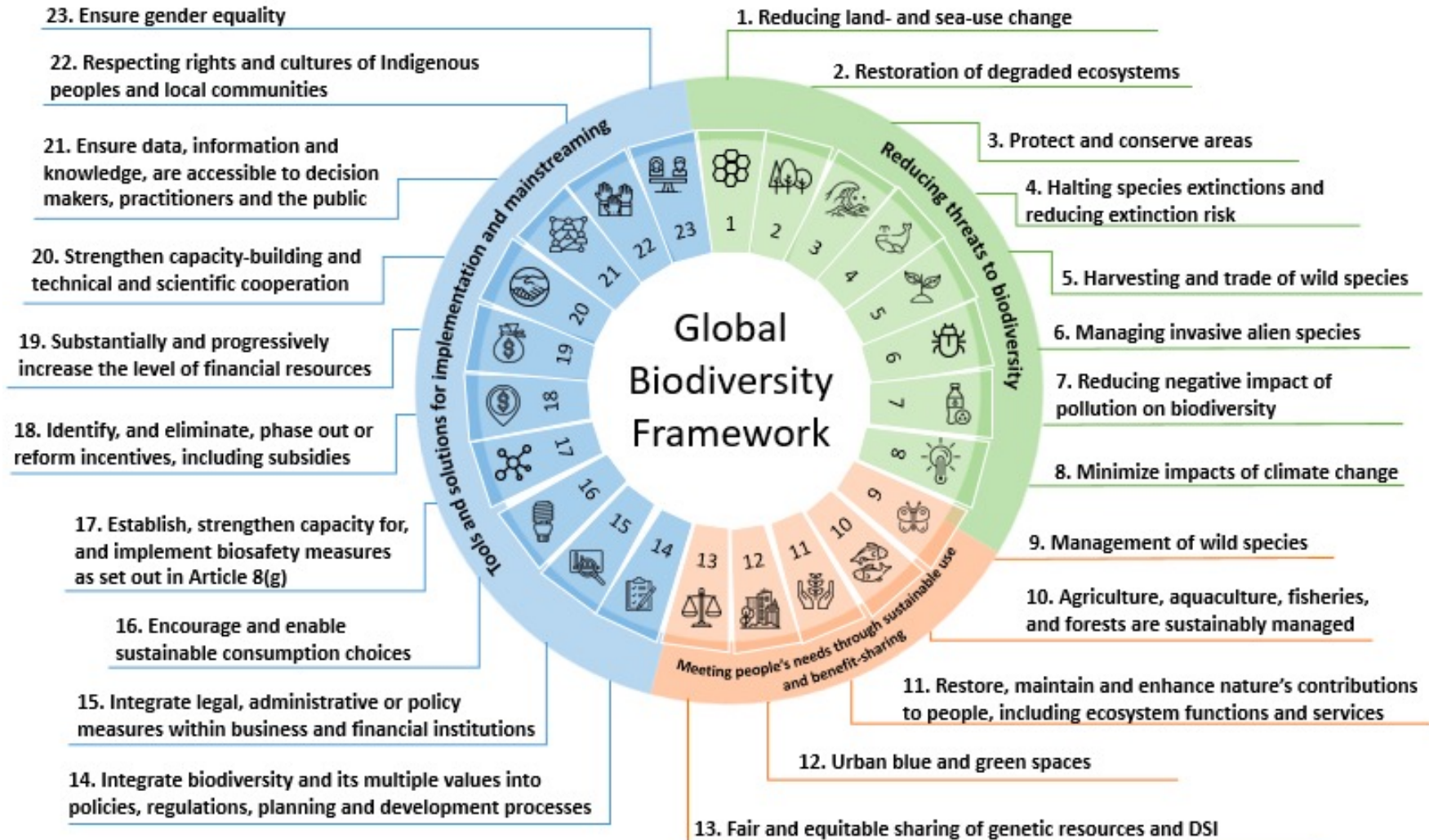


# Not Alone. There already is a Global Framework.



# Global Biodiversity Framework 23 Targets for 2030

## Kunming-Montreal Global Biodiversity Framework Themes and Targets



# The Three Pillars of Earth Action

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# OUR CHALLENGE

End-to-end questions  
resulting in decision  
support tools with  
impacts addressing  
end-user needs at  
national to global scales



# *What is Impact?*

1. **Knowledge Gain** - Improvement in understanding or ability
2. **Use** - Amount of product use by end user/public
3. **Change in Behavior** - Decisions made by end user with product
4. **Awareness & Perception** – Product awareness & perceived value
5. **Benefit** - Benefit to end user resulting from ASP product use
6. **Sustainability** – Long term continued use



An aerial photograph of a river delta, likely the Colorado River, showing a complex network of channels. The image is overlaid with a semi-transparent blue pattern of diagonal lines and a semi-transparent green pattern of diagonal lines, creating a layered effect. A dark blue horizontal band is positioned across the middle of the image, containing white text.

**Thank You; Now Let's Discuss**

# Earth Science to Action Strategy

Earth Science to Action



## 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 & Societal Value

- Offer models, scientific findings and info through Open-Source Science principles
- Support climate services
- Provide science applications and tools to inform decisions

## Earth System Science & Applied Research

- Grow scientific understanding of Earth's systems
- Develop predictive modeling for science applications and tools to mitigate, adapt and respond to climate change

## Foundational Knowledge, Technology, Missions & Data

- Technology innovation
- Earth observations missions
- Data collected from space, air and ground

# Example: Landsat to Landsat Next

Earth Science to Action



## Virtuous Cycle

- User needs inform development of Landsat Next

## Public Understanding & Exchange

- Seeking input from end users at Commodity Classic conference

## Solutions & Societal Value

- OpenET

## Earth System Science & Applied Research

- Ensemble of satellite-driven models used to map evapotranspiration

## Foundational Knowledge, Technology, Missions & Data

- Landsat satellite data