National Aeronautics and Space Administration

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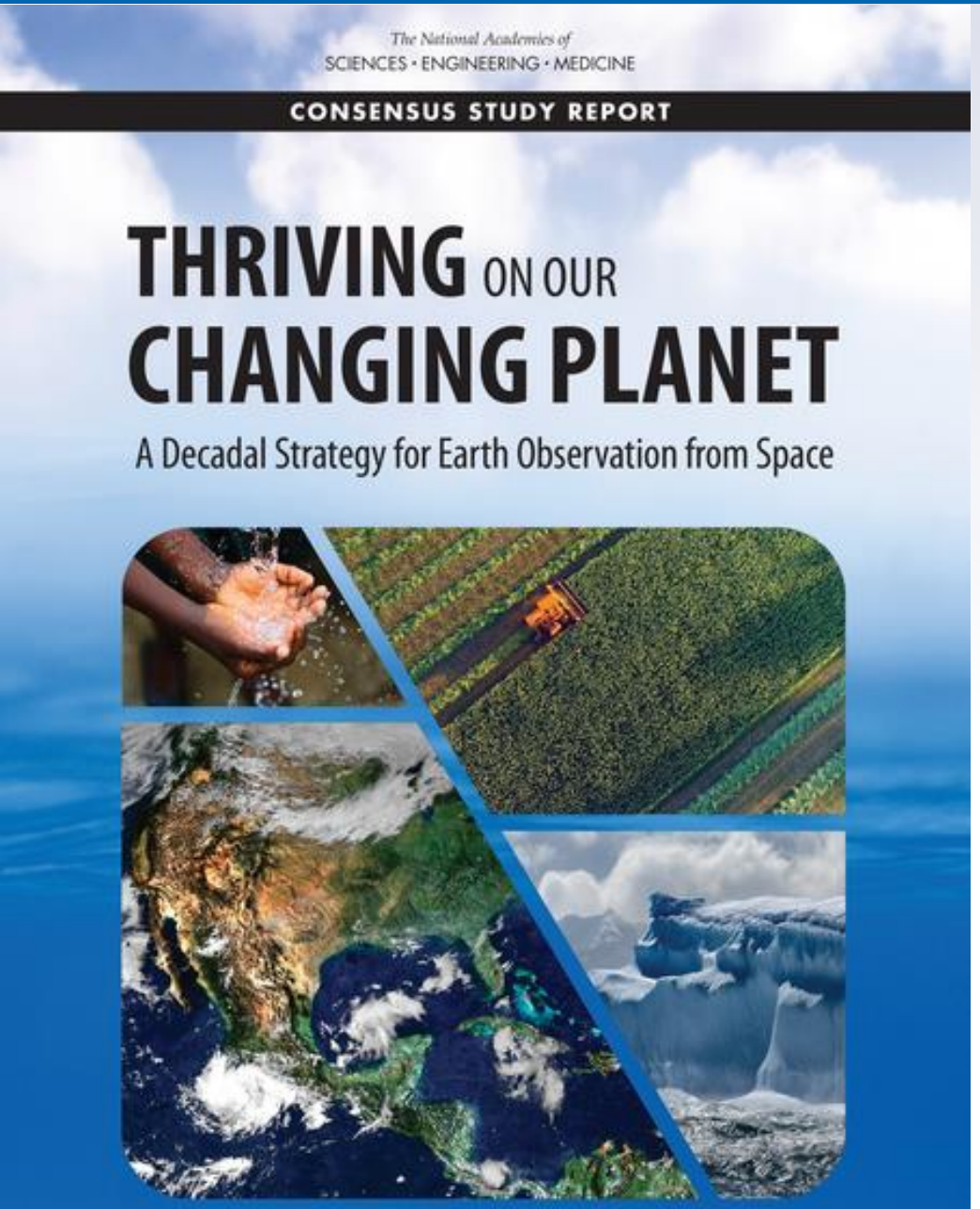
V1.1

We are at a pivotal moment

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

Setting the stage



Key National Academies Guidance

Increase the impact of Earth science for the response to climate change

"Pursue increasingly ambitious objectives and innovative solutions that enhance and accelerate the science/applications value of space-based Earth observations and analysis to the nation and the world in a way that delivers great value, even when resources are constrained, and ensures that further investment will pay substantial dividends."

- Thriving on Our Changing Planet: A Decadal Survey for Earth Observations from Space, 2017

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 2017 Decadal Survey and other national priorities
- Drives next iteration of programs, missions, initiatives
- Informs budget approach
- Informs employee performance expectations

Earth Science: who's included

When we refer to "Earth science" we're referring to our very large Earth science community, which represents a broad array of talent, disciplines and approaches, including but not limited to:

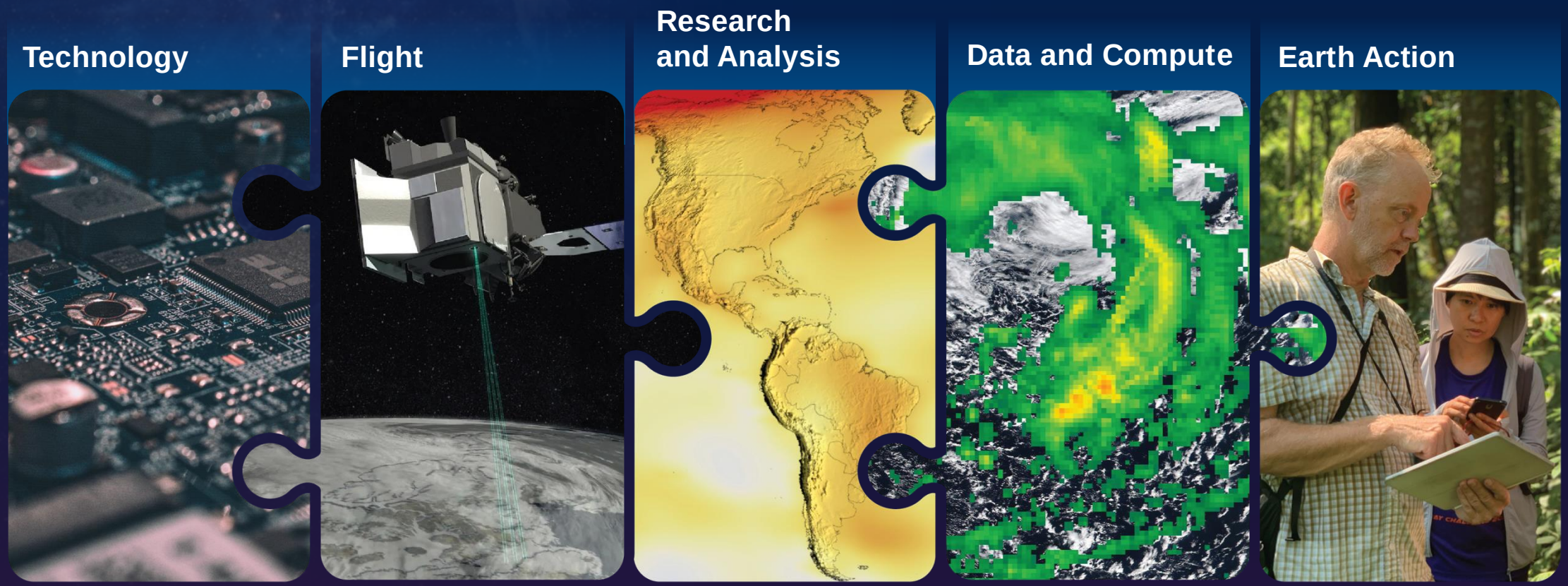
Disciplines

Agronomy
Atmospheric sciences
Biogeochemistry
Biology
Cryospheric sciences
Ecology
Geology
Geophysics
Human geography
Hydrology
Land use science
Meteorology
Oceanography
Physics
Radiation sciences

Approaches

In situ measurements
Airborne observations
Remote sensing
Research
Modeling
User engagement
Decision support
Capacity building

Earth Science: who's included



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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?

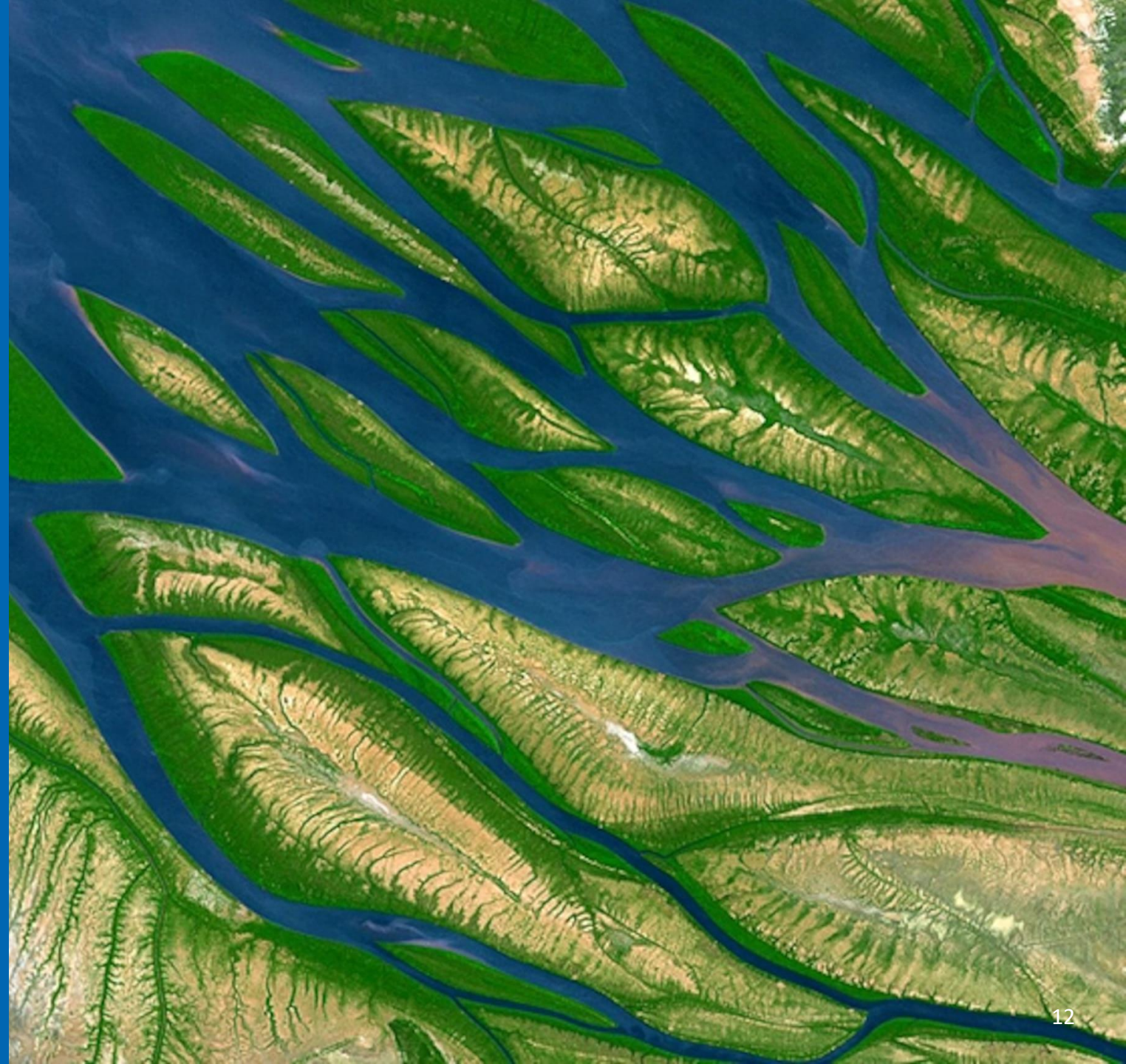
No! The strategy does not call for defunding some efforts to start others. Work to implement this strategy will take place across all elements.

- 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

Strategy content

OUR VISION

A thriving world, driven by trusted, actionable Earth science

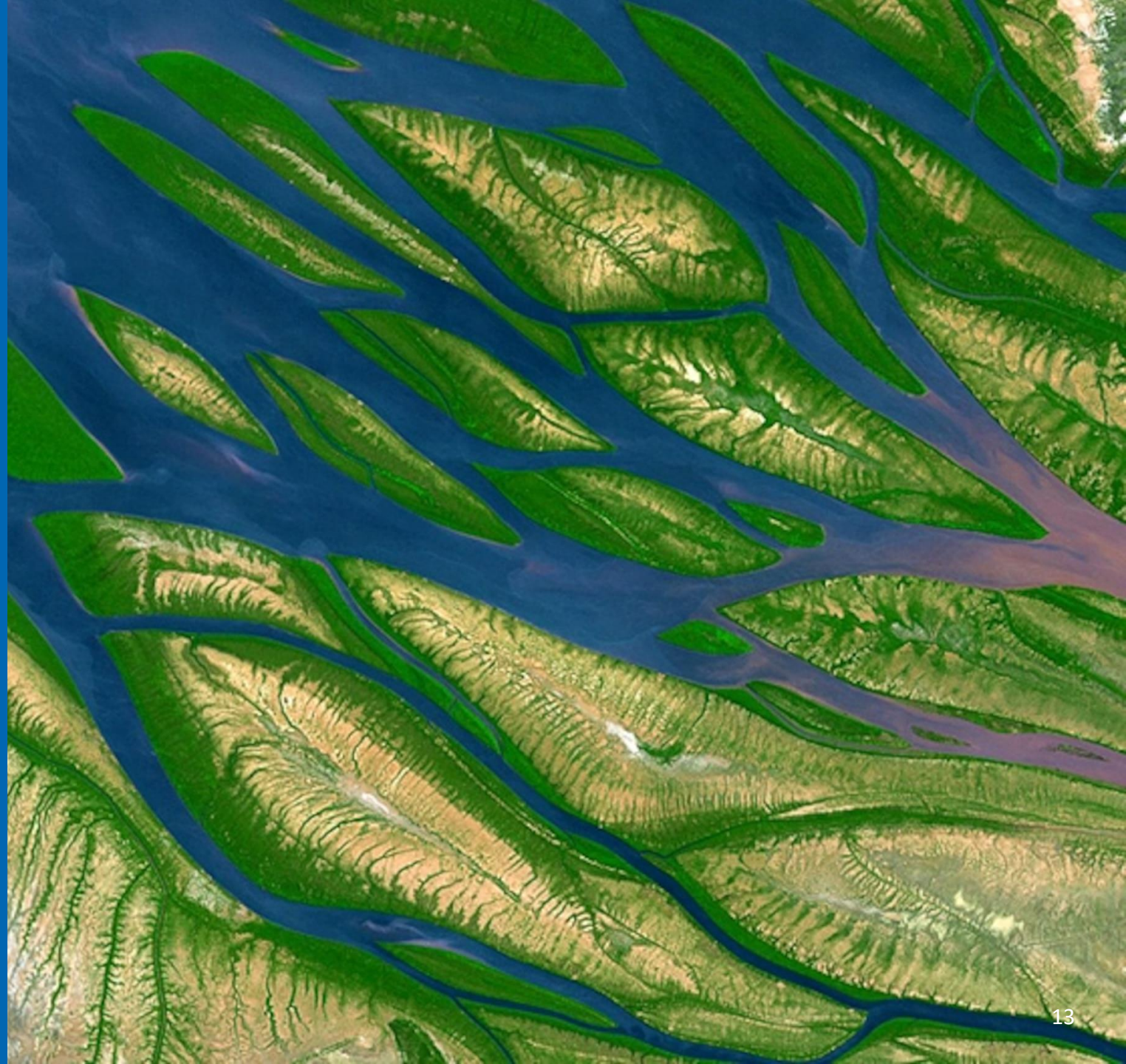


OUR VISION

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



We are

Innovating
Collaborating
Discovering
Delivering

Tapping the power of Earth science to benefit all

Aren’t we already doing this?

Our work has been excellent to date. Here are some examples to paint a picture of why change is still needed

A farmer managing crops

- Successfully used tools and techniques learned from previous generations to manage crops
- With increased frequency of drought and flooding, these tools, while previously effective, no longer suffice
- Makes changes and upgrades to remain successful under new conditions

Cascading effects

- Global warming is changing growing regions, impacting what grows where
- To address this new changing landscape, we must connect in ways we haven’t needed to before
- For example, moving from one mission at a time, to building integrated observatories that must work together

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

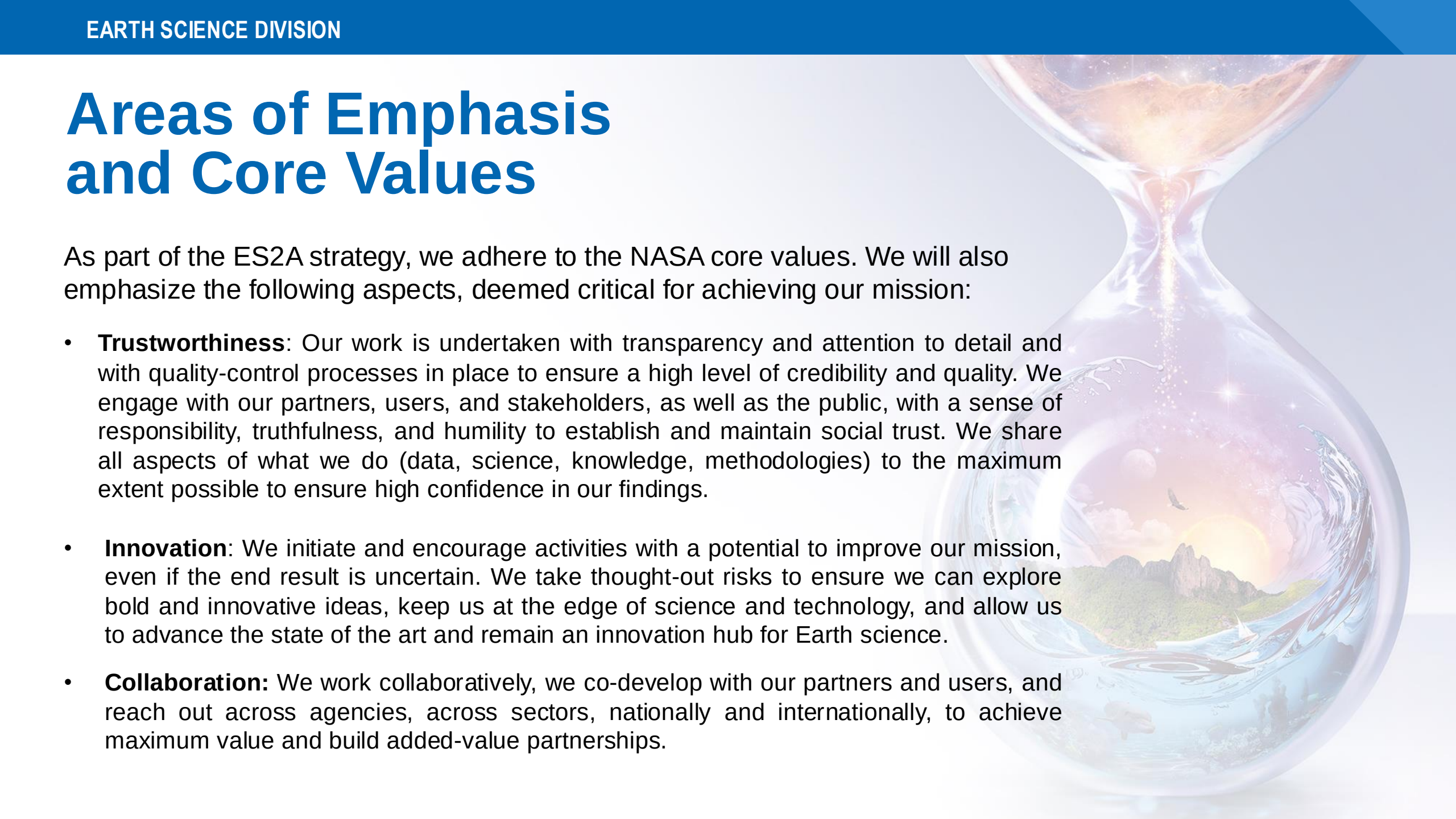
Areas of Emphasis and Core Values

As part of the ES2A strategy, we adhere to the NASA core values. We will also emphasize the following aspects, deemed critical for achieving our mission:

- **Trustworthiness**: Our work is undertaken with transparency and attention to detail and with quality-control processes in place to ensure a high level of credibility and quality. We engage with our partners, users, and stakeholders, as well as the public, with a sense of responsibility, truthfulness, and humility to establish and maintain social trust. We share all aspects of what we do (data, science, knowledge, methodologies) to the maximum extent possible to ensure high confidence in our findings.

- **Innovation**: We initiate and encourage activities with a potential to improve our mission, even if the end result is uncertain. We take thought-out risks to ensure we can explore bold and innovative ideas, keep us at the edge of science and technology, and allow us to advance the state of the art and remain an innovation hub for Earth science.

- **Collaboration:** We work collaboratively, we co-develop with our partners and users, and reach out across agencies, across sectors, nationally and internationally, to achieve maximum value and build added-value partnerships.



Guiding Principles

1. Amplify impact and augment our capabilities through enhanced partnerships
2. Engage the workforce and the wider Earth science community
3. Use a balanced approach when faced with competing factors
4. Encourage innovation to maintain cutting edge capabilities
5. Ensure robustness and resilience in our programs

Visualizing the strategy at work

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 & 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

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02.13.2024

Example: Landsat to Landsat Next

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

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What Do We Mean by Collaboration/ Partnership

Urgency

Responsibility

Leadership

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science.nasa.gov/earth

Your Home. Our Mission.