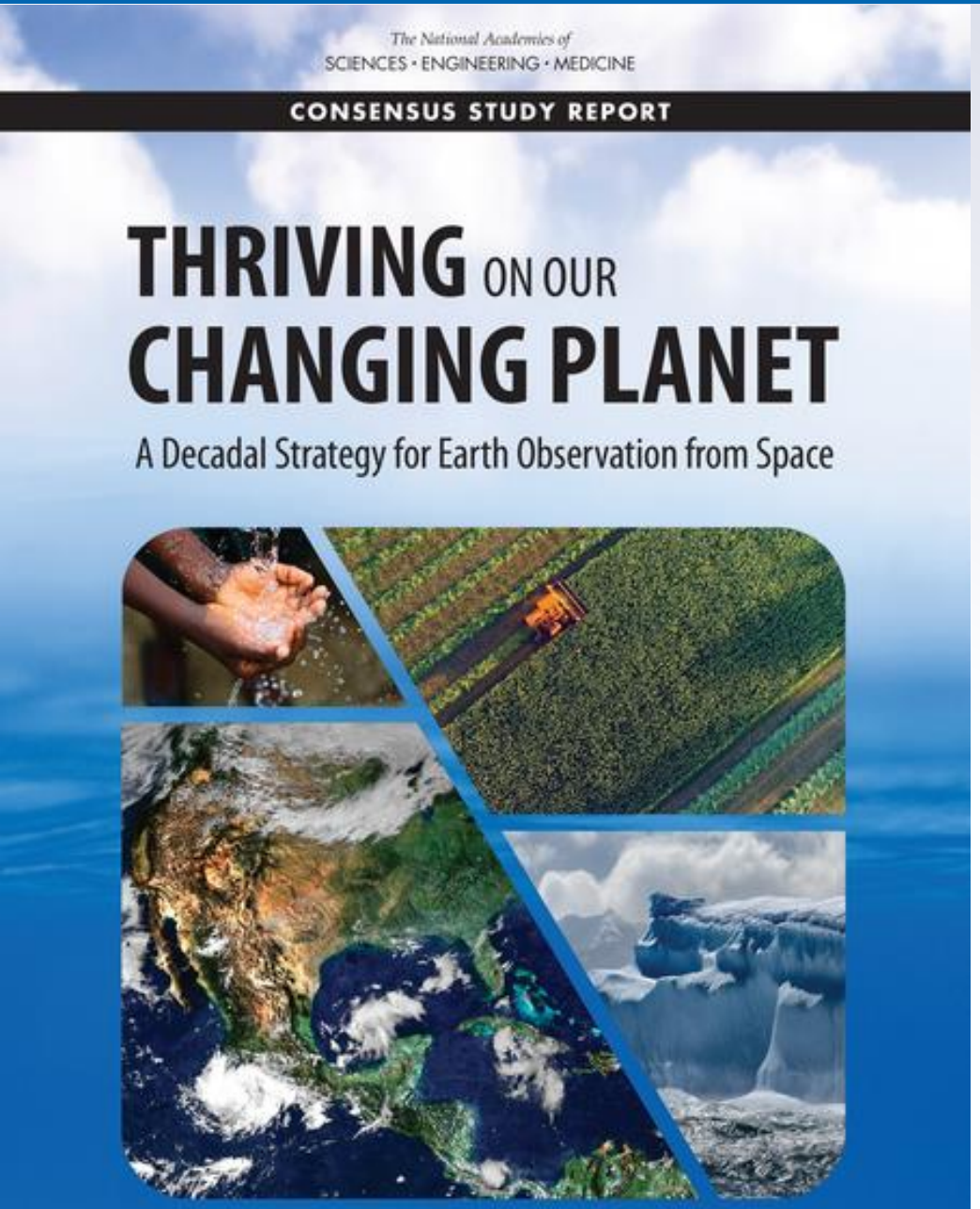
National Aeronautics and Space Administration

NASA earth

Overview of the NASA Earth Science to Action Strategy

Dr. Julie Robinson, Earth Science Division Deputy Director
NASA Science Mission Directorate

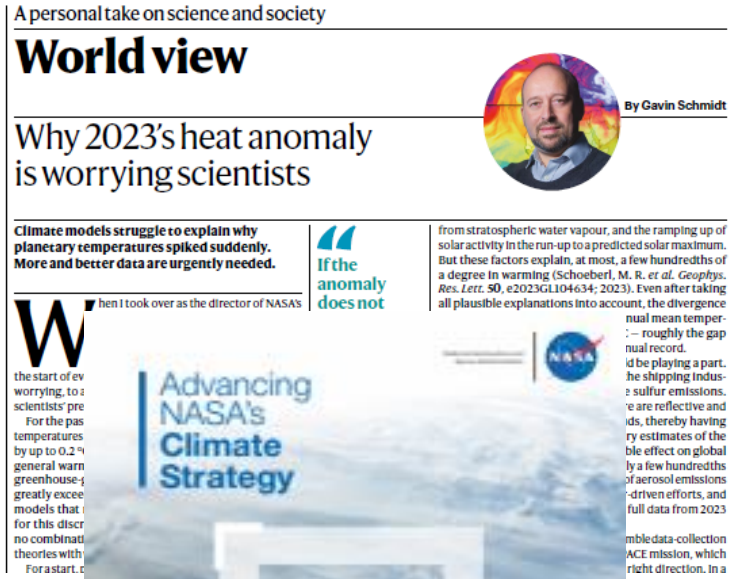


Key National Academies Guidance

- **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*

Global need


A personal take on science and society

World view

By Gavin Schmidt

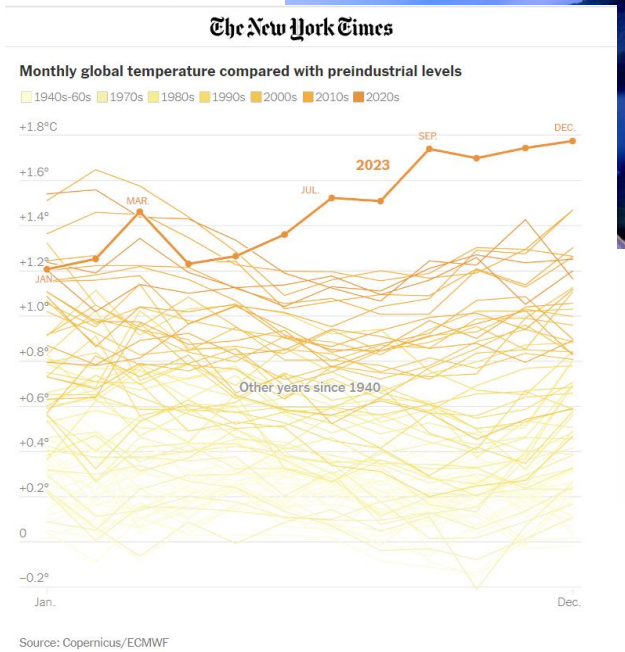
Why 2023's heat anomaly is worrying scientists

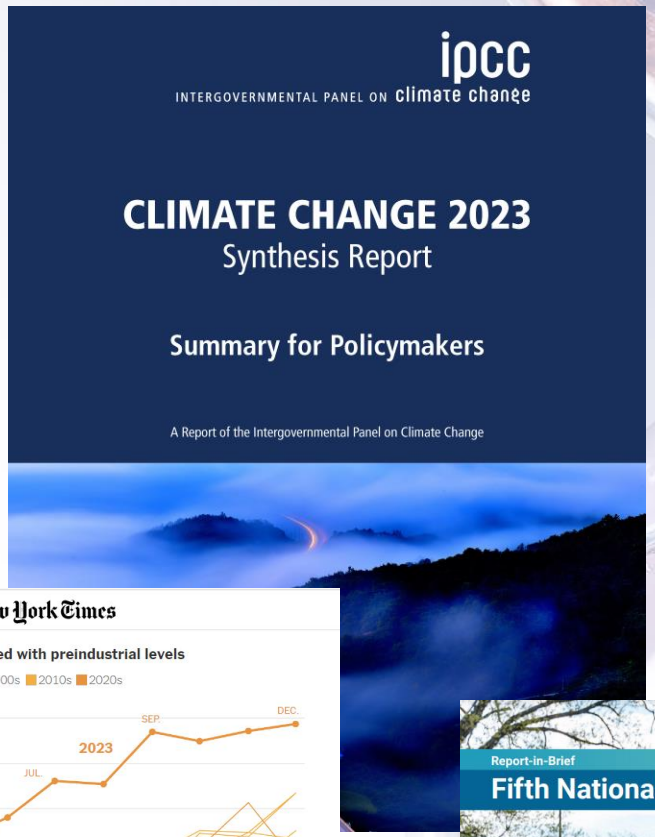
Climate models struggle to explain why planetary temperatures spiked suddenly. More and better data are urgently needed.

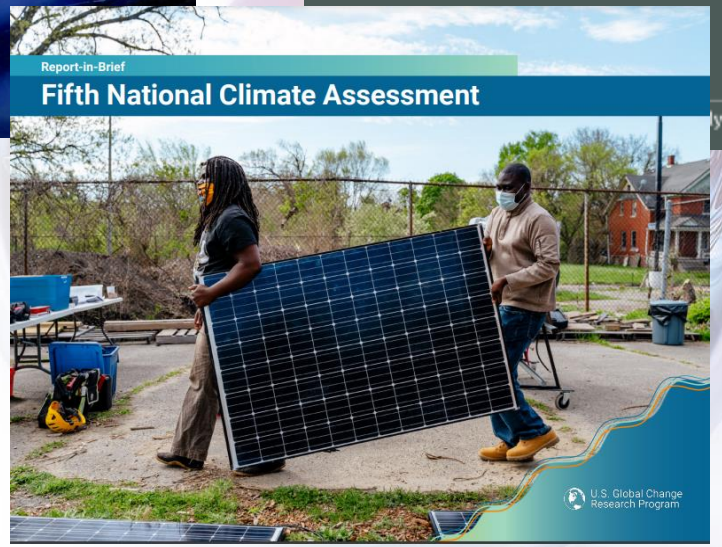
"If the anomaly does not

When I took over as the director of NASA's

from stratospheric water vapour, and the ramping up of solar activity in the run-up to a predicted solar maximum. But these factors explain, at most, a few hundredths of a degree in warming (Schoeberl, M. R. *et al. Geophys. Res. Lett.* **50**, e2023GL104634; 2023). Even after taking all plausible explanations into account, the divergence







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

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

Guiding Principles

1. Amplify impact and augment our capabilities through enhanced partnerships
2. Engage a diverse 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

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 operational 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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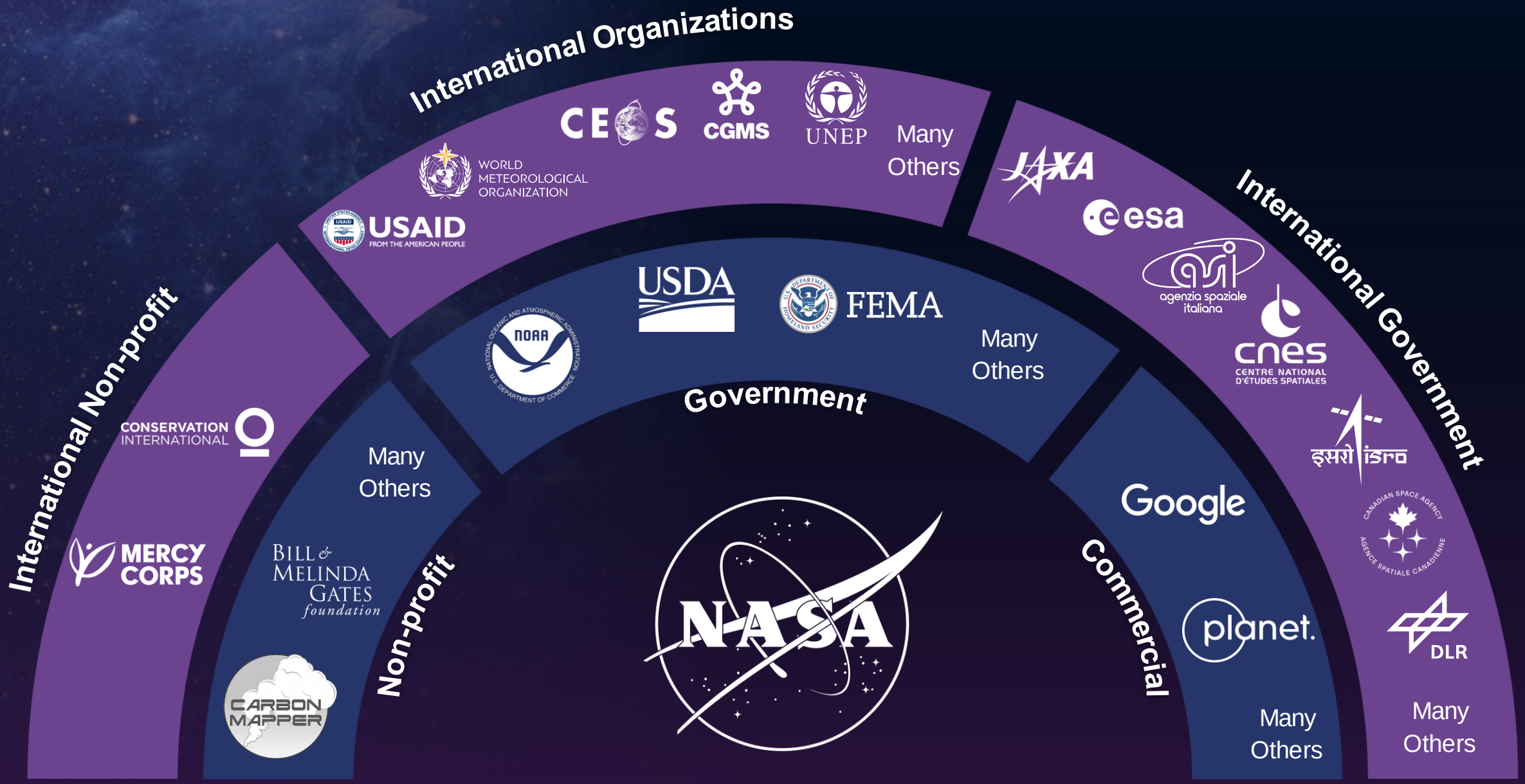
02.13.2024

Partnership and National / International Collaboration are Key



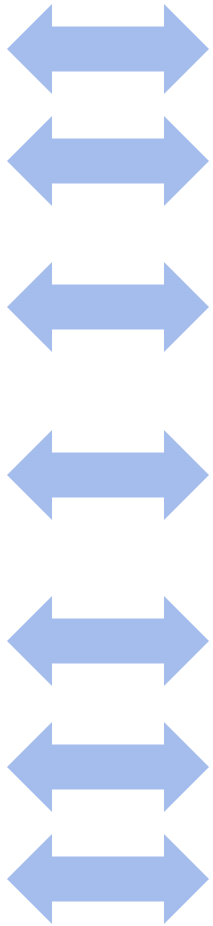
Growing our ESA – NASA Connections

- Since 2010, ESA and NASA have cooperated and collaborated in the area of Earth science and observation and global climate change
- The Joint Program Planning Group (JPPG) provides a framework for collaboration
- In June 2023, ESA and NASA directors agreed to investigate the possibility of setting up a new JPPG subgroup to cover enhanced cooperation on Earth observation applications and applied science
- The draft objectives (subject to change and approval) of this new subgroup are to:

1. To take maximum benefit from the technical expertise in both organizations by having the NASA and ESA teams **learn from one another's expertise**
2. To **increase the utility, impact and uptake of the EO applications** being developed by both agencies.
3. To **maximize benefit to common stakeholders** by ensuring coordinating between ESA and NASA, reducing confusion for those stakeholders

NASA and ESA Strategies: Common Goals

NASA Strategic Objectives and Key Results	
Objective 1: **Holistically Observe, Monitor, and Understand the Earth System**	1.1 The most advanced Earth observing system in the world:
	1.2 Cutting-edge technology
	1.3 Integrated and trusted Earth system data
	1.4 Scientific breakthroughs to better understand Earth
Objective 2: **Deliver Trusted Information to Drive Earth Resilience Activities**	2.1 Models that capture the intricacies of the Earth system:
	2.2 Co-designed solutions and tools to support users
	2.3 Science-based information we can trust and act on
	2.4 Promotion of Earth information as a national asset



ESA Strategic Objectives (Actions and Enablers)
7. To develop and implement an architectural blueprint for an EO system-of-systems for guiding long-term ESA research and technology preparation, mission implementation and operation … .
1. To pursue excellent, innovative, inspirational and impactful frontier science …
4. To ensure the EO science community takes full advantage of the opportunities offered by the existing (including archived and long-heritage data) and new missions that will be launched.
3. To advance interdisciplinary science, fostering the integration of socio-economic data and EO.
2. To develop scientific knowledge and capacity to deliver high-quality validated, trusted, actionable information products relevant to national, international and global policy frameworks.
14. To develop and enhance European capabilities for harnessing digital innovation, particularly AI, to maximise the exploitation of EO data for scientific and socio-economic benefits .
11. Maximise the outreach and communications of ESA EO scientific results toward the general public, policy makers and specially towards the younger generations .

NASA

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science.nasa.gov/earth

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