

# NATIONAL SPACE COUNCIL



USERS' ADVISORY GROUP

## **The Earth Information Action Lead: Strengthening Leadership to Enhance U.S. Earth Observation in Support of Climate and Societal Benefits**

National Space Council Users' Advisory Group  
Climate and Societal Benefits Subcommittee

January 29, 2024

The content of this paper reflects the thoughts and opinions of the subcommittee's authors and should not be construed as a recommendation of the full National Space Council Users' Advisory Group or the official policy of the United States Government, the National Space Council, or the National Aeronautics and Space Administration. This paper solely provides background information and context for findings or recommendations that were developed for submission to the National Space Council Office for consideration. This paper does not presume that any action will be taken.

## DELIBERATIVE

Strengthening Leadership to Enhance US Earth Observation in Support of Climate and Societal Benefits: The Earth Information Action Lead

NSpC UAG Climate and Societal Benefits Subcommittee

### **Purpose**

Americans are on a quest to identify, capture, and interpret the most trusted, timely, and relevant environmental insights about the changing world around them. At the heart of this endeavor is the U.S. Government's (USG) robust space-based Earth observations that enable U.S. citizens and people worldwide to receive severe weather alerts, air quality warnings, and numerous other critical data points that drive travel, safety, energy, insurance, water, health, real estate as well as climate mitigation, adaptation, and resilience decision making. The purpose of this paper is to examine and recommend how the U.S. could better meet the growing and more diverse user demand and ensure that active participation and cooperation with the private sector is considered and leveraged to the fullest for the climate and societal benefit.

### **Background**

The U.S. like all nations across the world is faced with rapidly evolving challenges and impact related to climate change and other environmental issues facing society. Drought, water shortages, poor air quality, shrinking arable land, wildfires, sea level rise, extreme weather, and greenhouse gases reduction are just a few of the critical challenges facing governments, businesses, civil society, and citizens in today's ever-changing world.

At the core of understanding these challenges and their all-important interconnections is data provided by vital Earth Observing (EO) systems that monitor the Earth and serve as the foundation of the science that enables insights into not only what is changing, but why. Advanced analytics, visualizations, modeling, machine learning, and artificial intelligence transform the observations into global to local insights and make interpretation possible as to what may happen in the future. At the core of all of these capabilities lies data, particularly data on regional and global scales.

The National Aeronautics and Space Administration (NASA), National Oceanic and Atmospheric Administration (NOAA), and United States Geological Survey (USGS) provide the most robust fleet of space-based EO systems in the world aimed at understanding Earth and Earth System processes. When integrated and analyzed with other USG and private sector data sources (space-based, airborne, and in situ) these space-based EO are enhanced to deliver a unique and critical capability that is vital to our nation's understanding, response, and preparedness of current and future climate-related and other societal challenges.

Through a different lens, the abundance of challenges the nation faces because of climate change and societal demands can be described as security issues. Whether environmental security, food security, energy security, water security, economic security or human security, the nation relies on the vital, civil space-based EO capabilities of NASA, NOAA, and USGS to understand and respond the risks of a rapidly changing planet.

For this reason, the demand for Earth-related information products has increased significantly. From local governments to insurance companies to farmers to health professionals and patients to

## DELIBERATIVE

### Strengthening Leadership to Enhance US Earth Observation in Support of Climate and Societal Benefits: The Earth Information Action Lead

NSpC UAG Climate and Societal Benefits Subcommittee

renewable energy suppliers and users to home buyers. Americans are on a quest to capture the best, most timely, thorough, trusted environmental insights and interpretation to guide decision making. Because of this increasing demand, multiple changes are taking place in the sector:

- a growing and more diverse group of public and private sector users is seeking to discover and apply USG open Earth observation data;
- Federal policies such as the Inflation Reduction Act (IRA) are driving investments in energy transition and infrastructure that are enabled by improved data and information.
- USG agencies are trying to address a flood of new users who are less knowledgeable of these assets than their traditional science users and respond to requests for new applications such as wildfire insights for tribal cultural burning as well as the wildfire insights for insurance and reinsurance analysis;
- Federal agencies are requesting greater coordination and collaboration on priority issues such as greenhouse gas monitoring, drought, severe weather, and air quality; and
- Private sector and non-profit entities are emerging or increasing efforts to fill USG monitoring gaps and meet new demands for observations and easy-to-use and access information products (e.g., air quality).

These changes along with others such as the Department of Defense's interest to better identify and understand authoritative climate data, environmental information's growing role in soft power, specifically climate diplomacy, have amplified the need to address several long-standing USG EO issues. Perhaps the most important is how to leverage what is estimated to be a \$4 billion annual investment in space-based EO so that the data is easier to find, access, integrate, and apply. Several questions should be considered:

- How can the U.S. ensure that the systems and science exist and will exist in the future to address the most critical questions of the day such as monitoring Greenhouse Gases (GHGs) globally and at the source-level, water availability, agriculture, drought, wildfires, etc.?
- What are the emerging capabilities of the private sector that fill gaps, best enhance USG efforts, and best serve the American people our global interests?
- How can strengthened cooperation be better facilitated amongst the agencies and private sector to better protect and serve the U.S. and its missions?
- How can more complete, accessible EO data and assets support USG's mission to drive influence and global resilience to exogenous events ensuring security in the broadest terms?

What is known is that the U.S. must move at greater speed and scale to mitigate and adapt to climate change, to meet related economic, health, humanitarian, resilience, security, and other societal challenges. USG EO assets are at the center of the nation's response in this regard and their benefit must be maximized. In addition, the private sector will play a greater role in future national climate mitigation, resiliency, and adaptation efforts.

## DELIBERATIVE

Strengthening Leadership to Enhance US Earth Observation in Support of Climate and Societal Benefits: The Earth Information Action Lead

NSpC UAG Climate and Societal Benefits Subcommittee

The urgency and complexity of climate change and its importance to our national interests demands new thinking and approaches. USG EO efforts are spread across several agencies and are guided by different missions and priorities, subject areas, science versus operations frameworks, budget structures, planning processes, private sector engagement mechanisms, and end users.

Although several coordination bodies exist to promote cooperation (U.S. Group on Earth Observations [USGEO], National Geospatial Advisory Committee [NGAC], U.S. Global Change Research Program [USGCRP]), these are best efforts organizations and not decision-making entities that set priorities, establish cross-agency data integration policy, streamline research to operations efforts, consider the entire U.S. and global public and private EO sector landscape, or develop a truly “national” vision for EO assets and outputs. Therefore, it is a recommendation of the Subcommittee to recommend a new EO leadership framework to accelerate efforts and maximize its benefit. Such a framework would enhance and better harmonize and further operationalize the excellent work NASA, NOAA, USGS as well as other Federal agencies, and capitalize on economic and societal benefit opportunities of the private sector.

### **Recommendation**

The Subcommittee on Climate and Societal Benefits recommends establishing an over-arching leadership role within the National Security Council (NSC) of the Executive Office of the President to assess, prioritize, and guide the nation’s multi-agency Earth observation effort for the purpose of improving environmental information and action.

Within the Executive Office of the President, the [National Security Council’s](#) Climate Security and Adaptation Director should serve as the USG lead for Earth information and action.

The NSC (USG lead for Earth and information action) will establish a process and convene key representatives to work across agencies to address and set policies for:

- Priority observation needs and capabilities;
- Emerging users’ needs;
- Data discovery, access, and integration issues;
- Data ethics;
- Greater private sector data use;
- Prioritization of application areas; and
- Mechanisms to facilitate private sector engagement and collaboration.

These topics will be addressed through active NSC facilitated engagement with designated representatives from:

## DELIBERATIVE

### Strengthening Leadership to Enhance US Earth Observation in Support of Climate and Societal Benefits: The Earth Information Action Lead

NSpC UAG Climate and Societal Benefits Subcommittee

- NASA Earth Science
- NOAA
- USGS
- EOP/National Space Council
- EOP/Council on Environmental Quality
- EOP/Office of Science and Technology Policy
- USGEO
- NGIC
- USGCRP
- Others TBD

It is the intent of this recommendation to elevate, integrate, and build upon the work of NASA, NOAA, and USGS in the context of climate change mitigation and adaptation as well as societal benefits. The recommendation also recognizes the increasing contributions of the private sector and the critical role that Earth observations play from a national security perspective.

#### Acknowledgements

The Subcommittee is very appreciative of the following experts, who were interviewed or provided input to this paper:

- Waleed Abdalati, PhD, Chair, NASA Advisory Council
- Jennifer Decesaro, Director for Recovery and Mitigation, NSC
- Michael Gremillion, Col. USAF (Ret), Director, Global Water Security Center
- Mike Kuperberg, PhD, Executive Director, USGCRP
- Laurie Schoeman, Sr. Advisor for Climate Resilience
- Swathi Veeravalli, Director of Climate Security and Adaptation, NSC

#### Subcommittee on Climate and Societal Benefits Findings and Recommendations

Overall findings of the Subcommittee include:

- **EO is vital:** Space-based Earth observation play a critical role in real-time measurement and monitoring of the changing and evolving planet.
- **Monitoring is not enough:** The U.S. and the global community need to move at greater speed and scale to mitigate and adapt to climate change to improve our resiliency.
- **We can do more:** Near-term opportunities exist to further EO application for societal benefits in high-impact areas such as agriculture, wildfires, greenhouse gas monitoring and reduction, and water resources.

## DELIBERATIVE

Strengthening Leadership to Enhance US Earth Observation in Support of Climate and Societal Benefits: The Earth Information Action Lead

NSpC UAG Climate and Societal Benefits Subcommittee

### **Recommendation 1: Earth Information and Action Lead (EIAL)**

Finding:

- The demand for Earth related information products has increased significantly demonstrating the vital role that space-based EO play in the Nation's ability to understand, respond, and prepare for climate-related and other societal challenges.

Recommendation:

- To establish an over-arching leadership role within the National Security Council to assess, prioritize, and guide the Nation's multi-agency EO effort along with consideration of private sector capabilities for the purpose of accelerating and improving environmental information and action promoting greater resiliency.

Rationale for Recommendation:

- The urgency and complexity of climate change and its importance to our national interests demands new thinking and approaches. USG EO efforts are spread across several agencies and guided by different missions, priorities, subject areas, science versus operations frameworks, budget structures, planning processes, private sector engagement mechanisms, and end users. For the U.S. to strengthen this critical capability, maximize the multi-billion-dollar annual investment, capitalize on rapidly-emerging private sector offerings, an over-arching leadership position is needed to guide and advance this national effort.

Consequences of No Action on the Recommendation:

- The U.S. will fail to meet the information needs of government organizations, businesses, and citizens who require the best, most timely, thorough, trusted environmental insights to guide decision making and ensure our national resiliency to adverse events (e.g., climate change, pandemics, etc.)