USGEO Town Hall

USGEO
What we represent
New & News

GEO
International Context
GEO Plenary XVI

Town Hall
What’s in it for you
Your voice
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Raise a hand and ask directly
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USGEO

Subcommittee of the White House National Science and Technology Council – Committee on the Environment

• Plan & coordinate federal Earth observations, research, and activities
• Foster improved Earth system data management and interoperability
• Identify high-priority user needs for Earth observations data
• Coordinate US positions for and coordinate participation in GEO
**The Plan – An Overview**

3 Goals; 11 Objectives; 32 Actions

- Recognizes the Earth Observations Enterprise
- Endorses the changing landscape of the provisioning of Earth Observations
- Designates USGEO as interagency forum for coordination of new missions, existing systems, decommissioning instruments, and continuity planning
- Encourages greater use of Cloud Computing and Artificial Intelligence
- Supports the Administration’s Management Agenda: *Data as a strategic asset*
- Advocates articulating the value of Earth Observations
- Supports U.S. engagement in GEO
- Supports development of a skilled workforce
# National Plan: Changing Landscape of Earth Observations

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<td>Support and Balance the Portfolio of Earth Observations</td>
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Fostering coordination, collaboration, and robust dialog broadly across the Earth Observations Enterprise.
AN ENTERPRISE IS RECOGNIZED

US Earth Observations Enterprise

Academia
Government
NGO's
Commercial Sector
Federal & National Laboratories
WHY EARTH OBSERVATIONS MATTER: MORE THAN $306 BILLION IN ONE YEAR OF DISASTERS
INNOVATIVE ACQUISITION STRATEGIES

Data as a Business – what does that mean? Government and private sector working together.

Rapid Increase in Commercial Creates Opportunity

- NOAA
- Gov't EO
- Commercial EO
- Other

--- | --- | --- | --- | ---
43 | 49 | 63 | 137 | 545
APPLYING AI TO EARTH OBSERVATIONS

Data volume, speed and variety can overwhelm legacy systems. AI offers efficiencies: finding patterns and extracting insights.

• Earlier advanced warnings for extreme weather events and natural disasters
• Better understanding of the rates and resilience of ecosystems undergoing change by natural or anthropogenic processes, such as extreme weather events and/or wildfire
CLOUD COMPUTING: LESSONS LEARNED

- Culture shift: rethinking how the workforce interacts with cloud and big data.
  - Concerns: jobs, training, costs, security, vendor lock-in/transitions
- Resources: cost of cloud should be viewed no differently than on-prem.
- Using tools, services, and policies “born in the cloud” vs. lift and shift.
- Many smaller migrations is more efficient to manage system dependencies.
- Need strategy to comply with anti-deficiency act when managing data egress costs for established “no-cost-to-user” data access policies.
- Embrace agile DevOps mindset – infrastructure will become code.
- Promote big EO data and open source “environments” in the cloud for facilitating collaborative geoscience, e.g., “Pangeo.”
IMPACT OF EARTH OBSERVATIONS

Develop methods of quantifying the social and economic value of Earth observations

• Often hidden in decision making and business so they go unnoticed

• Varied methods of determining impact

• Methods to accelerate the impact of the uptake of Earth Observations: accelerators, incubators, national prizes
DEVELOPING THE SKILLED WORK FORCE

Plan supports and builds upon the NSTC’s Committee on STEM Education, which recently released its 5-Year STEM Education Strategic Plan.

- A workforce with broad skill base: computer science to economics to law to social scientists to engineers to communicators.

Capitalize on existing programs with additional focus on the needs of the Earth Observation community

- NSF internships
- NSF Research Experience for Undergraduates Program
- NASA Applied Remote Sensing Training (ARSET) program
Identify and communicate to NASA federal-civilian agency requests for specific satellite-based Earth observation data and information products.

NASA assesses which it can serve with current missions, future plans, and/or with new funds. NASA notifies OMB/OSTP and gives feedback to agencies.

- First time in 2016-2017 - Second time in 2018-2019

NASA’s process included 5 phases:

**Phase 1:** Assess & verify the degree to which satellite data need is being satisfied either by Program Of Record (POR) or other means

**Phase 2:** Explore options and submit a preliminary report on each individual need & response that has the potential to satisfy the department/agency. Examined Level of Satisfaction & Level of Effort to determine needs to fulfill.

**Phase 3 & 4:** Consolidate technical and financial review of needs and potential responses
What is the name of the satellite mission, sensor, or data product that is currently or could be used to satisfy your needs?

Note: Number of counts - all 79 survey forms

What is the optimal spatial resolution to meet your need?

Note: Number of counts - all 79 survey forms

What is the optimal measurement or data product temporal frequency?

Note: Number of counts - all 79 survey forms

What spectral resolution or spectral bands would best meet your need?

Note: Number of counts - 56 survey forms
NASA examined the 79 needs (250 requests) relative to: Existing missions, Commercial Sources, NASA’s Program of Record (i.e., planned upcoming missions), and new Earth Decadal Survey Designated Observables.

NASA assessed the Level of Effort and expected Level of Satisfaction, focusing on opportunities where both:

Level of Effort was Minimal to Moderate
Level of Satisfaction was 80-100%
2016 SATELLITE NEEDS: ACTIVITIES TAKEN

1. The Airborne Data Management Group established to support faster access to data from airborne campaigns.

2. Provisional Harmonized Landsat-Sentinel Imagery over North America publicly available.

3. Support to the user community for National Geospatial-Intelligence Agency (NGA) products, including the user services (i.e. vetting users to ensure they meet the NGA EULA) and distributing products.

4. Supporting users requesting archived data as well as new acquisitions provided through NGA’s NextView license.

5. NISAR Quad Pol 40 MHz.

6. New downlink station with 9 TB/day of downlink capacity enabling the collection of high-resolution (8 m x 6 m) imagery over North America in quasi-quad-pol mode.

7. The Data Curation for Discovery (DCD) project assists other agencies in incorporating NASA Earth observation data into their workflows.
1. Production of a NISAR global 200m Soil Moisture product.
2. Produce a sub-weekly, global Surface Water Extent product from optical + radar imagery; 8 satellite harmonized product, Landsat-Sentinel-2-Sentinel-1+NISAR and SWOT.
3. Support ingest of Level 1b Ocean and Land Color Instrument data available through the Sentinel Gateway, perform data processing, archiving and distribution of data.
4. Produce a Land Surface Change detection product on a sub-weekly scale at 10 m to 30m: Landsat, Sentinel 2, radar from Sentinel 1 and NISAR.
5. Produce a North America Land Surface Deformation detection product/time series on a sub-weekly scale: Sentinel 1 + NISAR.
6. Increased spatial & temporal resolution of Radiation & Clouds products at SatCORPS.
8. Low latency freeboard & ice thickness over the Great Lakes from IceSat-2.
9. Animal Tracking: Advance ICARUS tag miniaturization and study the potential for CubeSat/Small Satellite deployment of an ICARUS-type system.
Promote & Leverage International Collaboration: GEO-XVI Week, Plenary & Ministerial Summit

GEO-XVI Activities: Nov. 4-8, 2019
- Plenary & Ministerial Summit
- Side Events
- Industry Track
- 12th Asia Oceana (AOGEO) Symposium
- Hackathon
- Pacific Island Programme

Over 1500 representatives from 57 countries.

13 Ministers and Deputy Ministers and
15 Ambassadors from countries, such as Ethiopia, Georgia, Iran, Uganda and others

Key Highlights

> First-ever GEO Industry Track. >50 reps from companies, including Planet, Google, Amazon Web Services, Esri, Maxar and e-GEOS

> Earth Science Data Operational Readiness Levels to Empower Disaster Responders. ESIP announced Operational Readiness Levels to improve data-driven decision making during disaster response and recovery.

> EO Worth $2T by 2030. The Asia-Pacific Economic Cooperation (APEC) released a new report highlighting that Earth and marine observing technologies will be worth $2 trillion by 2030. Australia highlighted the current and future economic value of EO to the Asia-Pacific region.

> Digital Earth Africa: DE Africa is enabling African nations to track changes across the continent in unprecedented detail by making EO data more easily accessible. As part of the Amazon Sustainability Data Initiative, Amazon Web Services (AWS) announced it will be supporting Digital Earth Africa.
GEO-XVI: 3 Notable Announcements

“Japan will provide free and open access to the wide-swath observation data from the L-band radar satellites, such as ALOS (ALOS/AVINIR-2, PALSAR) and ALOS-2 (ALOS-2/ScanSAR).”

Ms. Sasaki Sayaka
Parliamentary Vice-Minister of Education, Culture, Sports, Science and Technology of Japan

China has developed an open data policy for Gaofen satellites which allows free and open data access by the global community. Registered users around the world, without restrictions as long as they cite the source of the data, can freely discover and download the WFV data from the data platform CNSA-GEO, hosted by Huawei Cloud.

https://youtu.be/SvbbCGInWqc

“For the first time, China will share global data with 16-meter resolution from Gaofen-1 and Gaofen-6 satellites. We will share three types of such data with coverage outside China: historical records, daily updated Wide-Field-of-View images and global coverage data.

As a contribution from China, we just started the journey of open data. We really appreciate your feedback to help us improve this platform constantly. “This has been an expectation of the global community. … Now it comes true as a direct result of Dr. Gilberto Camara, [GEO Secretariat Director’s] visit to CNSA in April this year.”

Ms. Wenbo Zhao
Deputy Director of Earth Observation System and Data Centre, China National Space Administration

• Up to 25 licenses for Google Earth Engine, accessible to any GEO Member State and Participating Organisation, with a value of US$ 3 million over the next two years.
• Working with GEO to develop a allocation process

Helping to operationalize their work, helping to bridge the gap between science and application, in order to produce tangible products that engage with end users and decision makers.
FY21 ADMINISTRATION R&D PRIORITIES

OMB/OSTP Guidance to Agencies (August 2019)

R&D BUDGETARY PRIORITIES

• American Security
• American Leadership in Industries of the Future
• American Energy and Environmental Leadership - energy, oceans, Earth system predictability
• American Health & Bioeconomic Innovation
• American Space Exploration and Commercialization - Moon’s surface by 2024 as proving-ground for human mission to Mars

PRIORITY CROSSCUTTING ACTIONS

• Build and Leverage a Diverse, Highly Skilled American Workforce
• Create and Support Research Environments that Reflect American Values
• Support Transformative Research of High Risk and Potentially High Reward
• Leverage the Power of Data
• Build, Strengthen, and Expand Strategic Multisector Partnerships
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Erik Noble, OSTP, USGEO, and National Plan
Lawrence Friedl, USGEO, GEO Work Programme, and NASA
Karen St Germain, USGEO and NOAA
Peter Doucette, Cloud Computing, USGS
The Plan calls for the analysis of Earth Observations in support of economic sectors, such as agriculture, energy, transportation, or retail.

What are three key ways and venues USGEO could pursue to fulfill this action?
As commercial services both data and analytics become more available – what are key items we should think about when setting up a market-driven clearing house?
In what areas do you anticipate under-investment by the private sector over the next 10 years?

In what areas do you recommend the Federal government invest in over the next 5 years?
We are looking for successful programs that advance the uptake and use of Earth observations, e.g. accelerators, incubators, and industry clusters.

What is your feedback on current government programs?
Are there successful programs we should model?
Action: Work with commercial data providers and analytics companies to develop a set of best practices for commercial data buys.

How do you recommend we approach this?
Plan calls for an engagement plan with the Earth Observations Enterprise.

What are the best ways we can engage you and your organization in this Enterprise approach?
We are seeking feedback on the formulation of significant new observing systems.

What venues work best to solicit your feedback?
What models might the US government prioritize to increase the uptake of Earth observations?

A. Funding Opportunities
B. Incubators
C. CRADA
D. SBIR
E. Other?
Is your organization concerned about a potential shortage in workers trained on Earth observations and geospatial info?

If so, what efforts are you taking to alleviate this shortage?