U.S. Group on Earth Observations

AGU Fall Meeting | December 3, 2020

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Town Hall

USGEO
Updates

GEO
International Context

Panel
USGEO Activities
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
2019 NATIONAL PLAN FOR CIVIL EARTH OBSERVATIONS

A Report by the
U.S. Group on Earth Observations Subcommittee
Committee on the Environment

of the
NATIONAL SCIENCE & TECHNOLOGY COUNCIL

December 2019

US Earth Observations Enterprise

Goal One
Support and Balance the Portfolio of Earth Observations

Goal Two
Engage the Earth Observations Enterprise

Goal Three
Improve the Impact of Earth Observations
First-ever whole-of-government approach to identifying desired satellite products and measurement needs across the civilian departments and agencies, and communicating this information to NASA.

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.

Goal 3: Improve the Impact of Earth Observations

- **Action**: Conduct a biennial satellite needs process that includes an analysis showing how each agency has implemented or applied the available satellite data to meet the agency mission objectives

  - *First assessment*: 2016-2017
  - *Second assessment*: 2018-2019
  - *Third Assessment began June 2020, completion in April 2021*
2018 Satellite Needs – Needs Identified

- Production of a NISAR global 200m Soil Moisture product.
- 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.
- Support ingest of Level 1b Ocean and Land Color Instrument data available through the Sentinel Gateway, perform data processing, archiving and distribution of data.
- 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.
- Produce a North America Land Surface Deformation detection product/time series on a sub-weekly scale: Sentinel 1 + NISAR.
- Increased spatial & temporal resolution of Radiation & Clouds products at SatCORPS.
- Low latency freeboard & ice thickness over the Great Lakes from IceSat-2.
- Animal Tracking: Advance ICARUS tag miniaturization and study the potential for CubeSat/Small Satellite deployment of an ICARUS-type system.
2020 Satellite Needs Submissions

- 5 new Departments/Agencies
- NSF submitted needs based on inputs from across the agency

Survey Respondents to 2020 SNWG Survey

- USAID: 1
- Department of Homeland Security: 1
- Department of State: 3
- Environmental Protection Agency: 5
- Department of Energy: 16
- Department of Agriculture: 19
- Department of Commerce: 24
- Department of the Interior: 54

Cyclic Nature of Submitted Needs

- Continuous: 46.3%
- Episodic: 12.2%
- Systematic: 22.0%
- Periodic: 19.5%

Examples
- Periodic: Crop health during season or reservoir levels after snow melt
- Episodic: Imagery during forest fires or eruptions
- Systematic: Time-series to detect landslide motion, volcanic unrest, or ecosystem disturbance

Scientific Nature of Submitted Needs

- Decision-making or Operations: 60%
- Scientific Advance or Research: 40%
Goal 2: Engage the Earth Observations Enterprise

- Action: Perform a feasibility study to advance the Earth Observations Enterprise through activities such as accelerators, incubators, and industry clusters.
- Action: Scope an open-competition program that combines innovative Earth observation data sourcing, including identifying pathways for development and metrics to recognize and measure incubator success.

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Capture information on existing efforts

Assess if, how, and where Accelerators et al and Open Innovation could advance the EOE and the EO value proposition.

Identify issues for engagement
Innovation Task Team: Plan

I. Initial information gathering on Accelerators, Incubators, Industry Clusters and Open Innovation and Prize Competitions

II. Landscape assessment – Part A

III. Assess & discuss results from Part A

IV. Conduct interviews

V. Landscape assessment – Part B

VI. Synthesize information / Prepare report
Surface Issues hampering agencies from more quickly and effectively working with the rest of the Earth Observations Enterprise to accelerate innovation and improve access, products, and services

I. Deliver to USGEO (and EOE, as appropriate)
Data Management Working

• Reestablished to respond National Plan Activities
• Goal 1 – Support and Balance the Portfolio of Earth Observations
• Lead on 5 Actions
  • Action: Coordinate activities .... machine learning, AI, and data fusion to improve the usefulness and value of Earth observations to end-users.
  • Action: ... Develop procedures for the calibration and inter-calibration of sensors, and advancing data assimilation and re-analysis of historical data.
  • Action: Identify best practices and coordinate investment for commercial cloud services and high-performance computing access ... in coordination with the Federal Chief Information Officer community.
  • Action: With the Federal Chief Data Officer Council, coordinate and encourage efforts in data stewardship technologies and techniques to improve Earth observation data discovery and usability.
  • Action: Examine agency practices on how Federal funding opportunities are written to ensure that all Federally-funded project data are provided to a publicly accessible archive, consistent with Federal policies and regulations.
Data Management Working Group

• Input to 6 actions
  • Goal 1: Support and Balance the Portfolio of Earth Observations
    • Action: Work with commercial data providers and analytics companies to develop a set of best practices for commercial data buys. (With Commercial Task Team)
    • Action: Explore mechanisms for piloting a market-driven clearinghouse for the procurement of Earth observations data and analytics.
  • Goal 2: Engage the Earth Observations Enterprise
    • Action: Perform a feasibility study to advance the Earth Observations Enterprise through activities such as accelerators, incubators, and industry clusters. (with Innovation Task Team)
    • Action: Identify and evaluate existing models for federal/non-federal provision of Earth observations and web services to highlight areas for increased engagement.
    • Action: Engage in a focused, short-term initiative to discover new Earth observations from non-federal sources and determine paths for making the data discoverable and accessible.
  • Goal 3: Improve the Impact of Earth Observations
    • Action: Advance analytical tools and capabilities to analyze the Earth observation portfolio for chokepoints, useful measurements, dependencies, and connections to commercial data.
National Plan - National land Imaging Study

• Goal 1: Support and Balance the Portfolio of Earth Observations
  • Objective: Implement innovative Federal procurement and acquisition
    • Action: Identify shared agency needs related to land imaging and evaluate options for optimally addressing those needs with current resources through increased agency coordination.

• USGS 1-year National Land Imaging Study to address this objective, by April 30, 2021
  • Provide findings and recommendations that will benefit agency applications – 2022-2026
  • Build on previously collected requirements and capabilities information and analytical tools
National Land Imaging Study Phases

**Phase I: Study Prep**
- • Prepare Terms of Reference
  - Establish study boundaries
- • Assess and augment user need completeness; collect underrepresented needs from agencies and applications
- • Verify analytical tool performance

**Phase II: Gap Analysis**
- • Analyze user needs against land imaging architecture
- • Identify the set of needs that are well-served by the architecture, and not well-served (these are the gaps)
- • Conduct expert review of identified gaps

**Phase III: Analysis of Alternatives**
- • Identify and analyze candidate solutions to mitigate gaps, strengthen architecture
- • Select high-feasibility solutions for deeper analysis
- • Conduct expert review of recommendations

**Phase IV: Recommendation Development**
- • Conduct detailed analysis of feasible solutions and develop recommendations
- • Conduct expert review of recommendations
- • Develop final products
  - • Presentation
  - • Report

Timeline:
- 1 Apr 20
- 1 Aug 20
- 1 Nov 20
- 1 Jan 21
- 30 Apr 21
Commercial Task Team

• Goal 1 - Support and Balance the Portfolio of Earth Observations
  • Action: Work with commercial data providers and analytics companies to develop a set of best practices for commercial data buys.

• Goal 2 – Engage the Earth Observations Enterprise
  • Action: Work with commercial providers to understand issues, agency practices, and policies that foster development of small and medium businesses and start-ups.

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<th>Deliverable</th>
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<tr>
<td>Non-Federal Data Buys</td>
<td>Understanding of current data procurement - internal USGEO document</td>
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<tr>
<td>Commercial Environmental Data Definitions – White Paper</td>
<td>Government wide agreement on definitions and terminology on licensing; requirements process – internal USGEO document</td>
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<tr>
<td>Best Practices – Understanding the Opportunities and Challenges from the commercial sector’s perspective</td>
<td>Feedback on: government definitions; procurement processes; business opportunities using environmental information; impacts of moving to commercial environmental data buys on the research community – public document</td>
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New GLAM System Finds Immediate Relevance in 2020

http://gsn.nasaher.wet.org/

"Dry weather that allows the soybean harvest compresses the seeding of wheat. In Cordoba, soil moisture is the lowest in the last 6 years. I’m sharing the GLAM system developed by NASA Harvest, as seen in an excellent meeting of AMA."

- Esteban Capati, Head of Estimaciones (Bolsa de Cereales)

GEOGloWS Global Streamflow Forecasting System

COLOMBIA

PERU

CENTRAL AMERICA

Capacity Development: AmeriGEO Week

Communication, Outreach, Partnerships, Training and Development
GEO Week 2020

New GEO Members in 2020:
Namibia, Nicaragua, Rwanda

New GEO Participating Organization:
Coalition for Rainforest Nations

New GEO Associate:
Water Youth Network

Appointment of Yana Gevorgyan as the next GEO Secretariat Director effective 1 July 2021

Provisional approval: Urban Resilience & Human Settlements as a 4th GEO Engagement Priority

- Dec 7-9, Indigenous-led

GEO Pledge Campaign 2021

AGU PAPERS: EARTH OBSERVATION IMPACT

- SY006-01: Case Studies of Landsat Users in Machine Learning and AI: Mapping the Benefits of EO Data in a Data Ecosystem
- SY006-02: Valuing Environmental Risk Information: Evidence from Flood Insurance Rate Map Revisions
- SY006-03: Earth Observations Enable Cost-Effective Conservation of Eastern North Pacific Blue Whales
- SY006-04: Earth Observation Technology Applied to SDG 15.8 in West Africa: Multi-data Stream Analysis and Validation Approaches
- SY006-05: The socio-economic benefits of Earth Observation: measurement methods and challenges ahead
- SY006-06: Uncovering the Value in Earth Observations
- SY006-07: Economic and societal benefits of Earth observations: Repository design, development, and testing

Monday, 7 December, 2020

National Plan:
Action: Collect current agency-commissioned economic studies and synthesize the state-of-knowledge on the economic value of Earth observations, including their return-on-investment, ability to accelerate innovation, and contributions to economic growth.

Action: Develop a catalog of ways to quantify the social and economic value of Earth observations. Collect, catalog, and publish qualitative narratives and quantitative examples on the benefits of Earth observations.