Analyzing Federal Agency Earth Observation Needs: NASA's 2022 Satellite Needs Working Group Assessment

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Impact Interagency Implementation and Advanced Concepts Team

Background

The Satellite Needs Working Group (SNWG):

- Part of USGE0
- Surveys U.S. federal civilian agencies every two years about the Earth observation data they need to accomplish their high-priority objectives





SNWG Management Office

The SNWG Management Office at NASA IMPACT is responsible for:

- Managing and coordinating the assessment of agency needs
- Managing the implementation of solutions to meet agency needs

Distribute Survey	SNWG develops a survey, USGS manages distribution and gathers vetted agency needs.
Gather Inputs	Vetted responses are provided to USGE0. USGE0 provides those surveys to NASA.
The 20XX Cycle: Assessment	NASA, NOAA, and USGS review submissions, assign to review teams, evaluate current capabilities, and propose new solutions.
Appropriations and Selections	Congress makes appropriations available to NASA/ESD for solutions prioritized by the Office of Management and Budget.
The 20XX Cycle: Solutions	Solutions funded and selected go through a complete formulation and peer review of their technical implementation.
Implementation and Stakeholder Engagement	As solutions are implemented, collaborations throughout SNWG and NASA solicit stakeholder feedback and offer training.
Sustained Operations	Solutions address the needs of SNWG stakeholders and are adopted for operational decision-making and research.
Next Biennial Survey Incorporate Lessons Learned Outreach to new Survey Partners Opportunities for New Solutions	New Solutions for Agencies



The SNWG Agency Survey

- Four complete survey cycles starting in 2016
- ~400 surveys received, providing information on:
 - The nature of agency needs
 - The geophysical features or phenomena being observed
 - Data measurement characteristics
 - Data format and access mechanisms
 - Limitations to the use of satellite data
 - Training needs





Assessment of Satellite Data Needs

The SNWG assessment is an eight-month process carried out by three agencies that operate Earth-observing satellites: NASA, NOAA, and USGS

• Over 100 scientists participated in the assessment of 2022 SNWG agency needs





Agency Participation and Requested Observables

- In 2022: NASA assessed 115 surveys submitted by 29 agencies across the Federal government
 - Slight decrease from 2020
- Number of surveys needing to observe infrastructure doubled
- Trend: More agencies need data for decision-making purposes





Key Measurement Characteristics (1 of 2)

- Spatial resolution, geographic coverage, and temporal frequency are most important to agencies
 250 km - 500 100 km - 250 m 10m - 250 m 10m - 250 m 30m - 100m 10m - 250 m 30m - 100m 10m - 250 m 30m - 100m 10m - 30m 5m - 100
- Most surveys (53%) request data for US states and territories; 37% request global data
- Trend toward increased spatial resolution: The percentage of <1 m requests has nearly tripled





Key Measurement Characteristics (2 of 2)

- Trend toward more frequent observations: Over 50% of responses now seek daily/sub-daily data
- ~27% of responses need data latencies <3 h





Satellites, Data Systems, and Training

- Data handling (data volume and transformation) and need for real-time access are the greatest factors limiting agencies' use of satellite data
- Agencies prefer high-level, gridded, multi-satellite products but can use less processed
 data
- Trend: Direct download remains the preferred access mechanism, but 79% of responses rank cloud-based mechanisms in their top 3
- New question on training needs





2022 Assessment Outcomes

- Over 110 potential solutions (new science activities) identified that would help meet agency needs
- NASA identified six science solutions and four commercial data-related solutions that would best meet the needs of multiple agencies. Science solutions include:
 - Vertical land motion product
 - Low-latency Harmonized Landsat Sentinel-2 (HLS) products
 - TEMPO near real-time SO₂ and enhanced products
 - ARSET remote sensing training
 - Multi-sensor ocean surface winds product
 - Harmful algal bloom (HAB) hotspot product
- The proposed 2022 solutions are currently awaiting appropriations



Learn More About SNWG!



SNWG solutions page on Earthdata

- Background and current status of each solution
- Links to access available data



SNWG Earthdata search portal

 Direct access to 65 (and counting) datasets related to SNWG solutions



Stakeholder Engagement Program webpage

 Training resources and workshop info for SNWG solutions

Learn More

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