

NASA's Satellite Needs Working Group Management Office: Developing Solutions in an Agile, Open Science Environment



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A Survey of Satellite Data Needs

The Satellite Needs Working Group (SNWG):

- Part of the U.S. Group on Earth Observations (USGEO)
- Surveys U.S. federal civil agencies every two years about the Earth observation data they need to accomplish their high-priority objectives

The SNWG agency survey:

- Four complete survey cycles starting in 2016
- **400 high-priority satellite needs that span Earth Science and represent a wide variety of applications for Earth observation data**

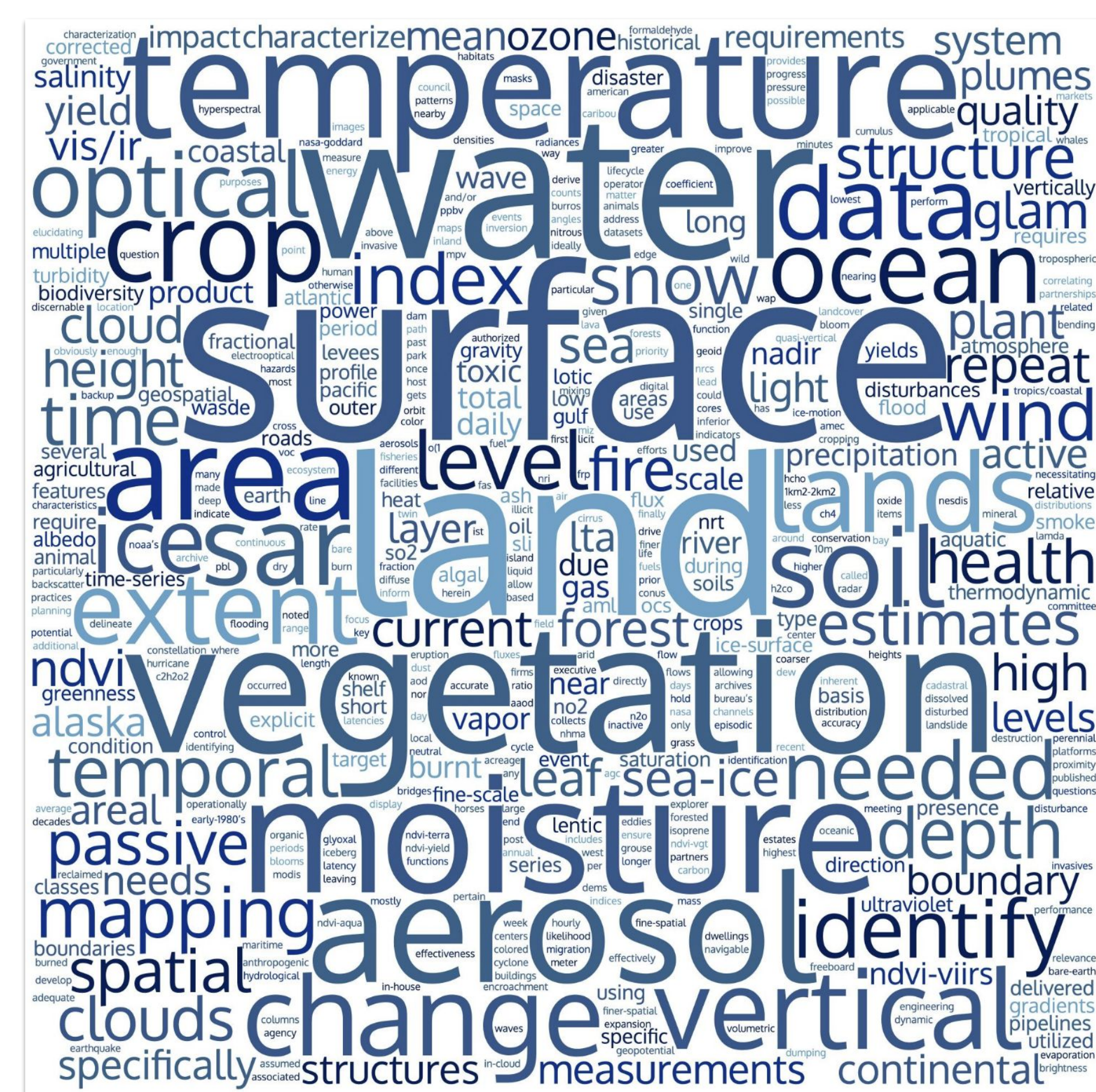


Figure 1. Word cloud representing the geophysical observables requested by agencies in the 2022 survey.

Solutions to Inform Decisions

- The majority of requests are for **data to inform agency decision-making**
- NASA is developing a suite of over 25 solutions to help meet these needs
- Many of these solutions are global data products or product suites that have broad benefits for the research and applications communities
- NASA's SNWG Management Office coordinates the **assessment of agency needs** and oversees the **implementation of solutions** in an open science environment

Global Solutions for Science and Applications

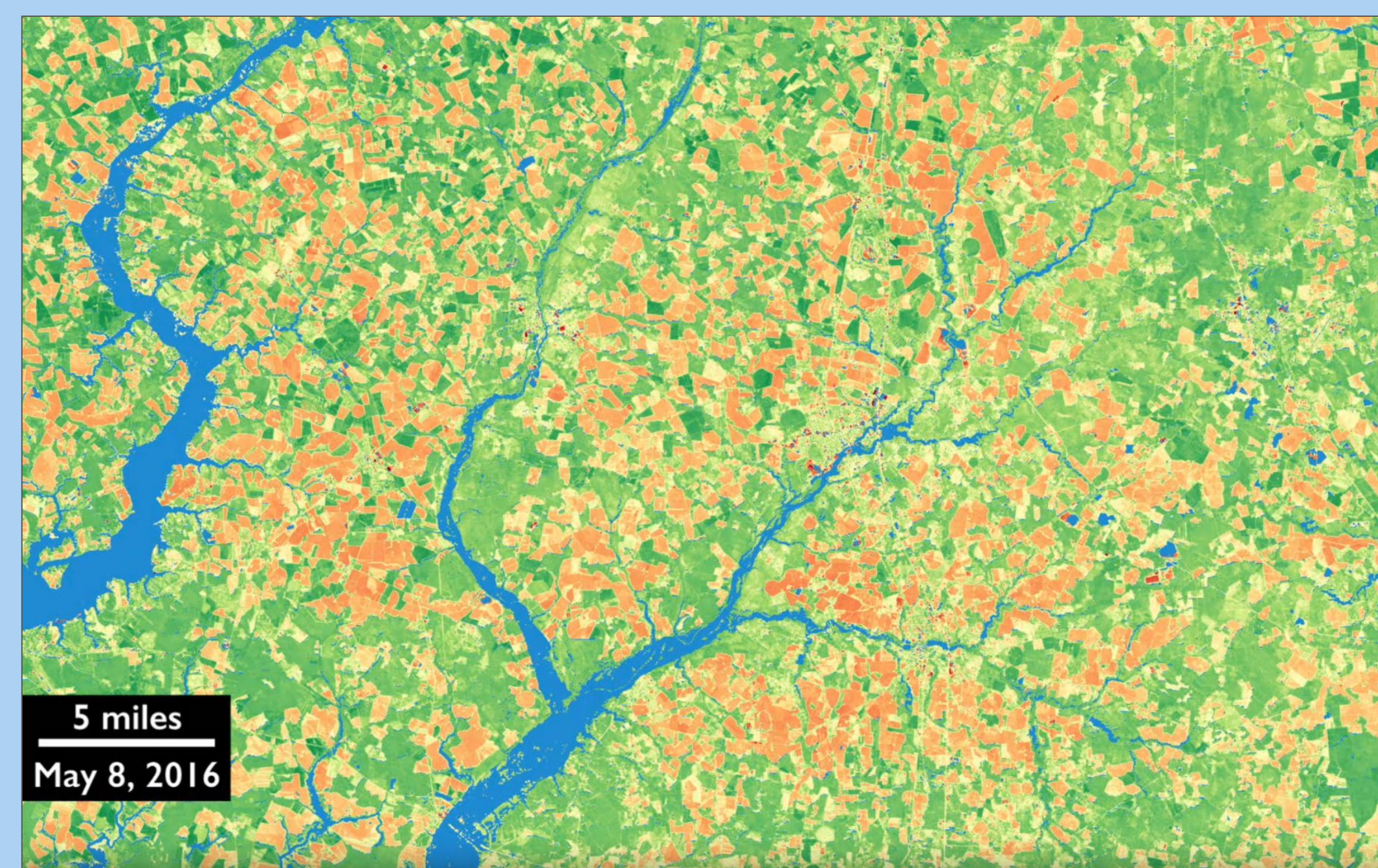


Figure 2. HLS-derived Normalized Difference Vegetation Index data shows areas of healthy vegetation (green) and bare soil (red).

Harmonized Landsat Sentinel-2 (HLS) Imagery

- Surface reflectance data from the Operational Land Imager (OLI) on Landsat-8/9 and the MultiSpectral Instrument (MSI) on Sentinel-2A/B
- Combined measurements provide **global observations every 2-3 days, enabling time series analysis**
- Applications include monitoring of the land surface, vegetation health, and change detection
- On the horizon: A global vegetation indices suite: NDVI, EVI, SAVI, MSAVI, NDMI, NBR, NBR2, TVI, NDWI

Access HLS data!



Dynamic Surface Water Extent (DSWx) and Land Surface Disturbance (DIST)

- Analysis-ready DSWx products measure **surface water multiple times per week** using HLS optical imagery and cloud-penetrating radar data from Sentinel-1/NISAR
- Applications include flood and drought monitoring, habitat assessment, wetland preservation, and water resource management
- DIST-ALERT product detects **land surface change at various spatial and temporal scales**
- Applications include tracking wildfires and invasive species, monitoring forest health and deforestation, and detecting land cover change
- On the horizon: Land Surface Displacement time series derived from Sentinel-1 and NISAR using InSAR techniques (North America only)

Access DSWx data!



Access DIST data!

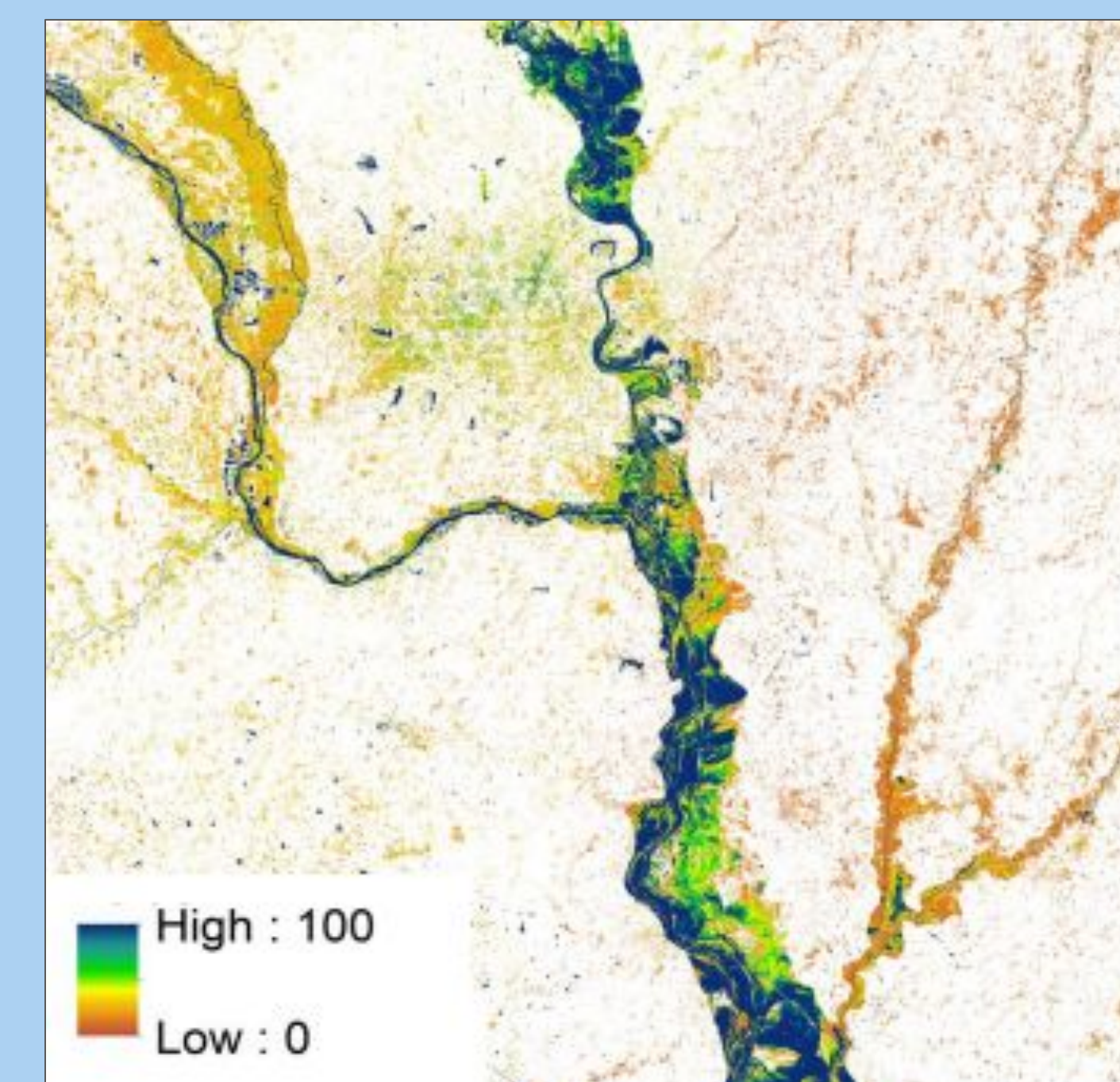


Figure 3. DSWx observations of inundation frequency reveal flooding impacts to agricultural regions.

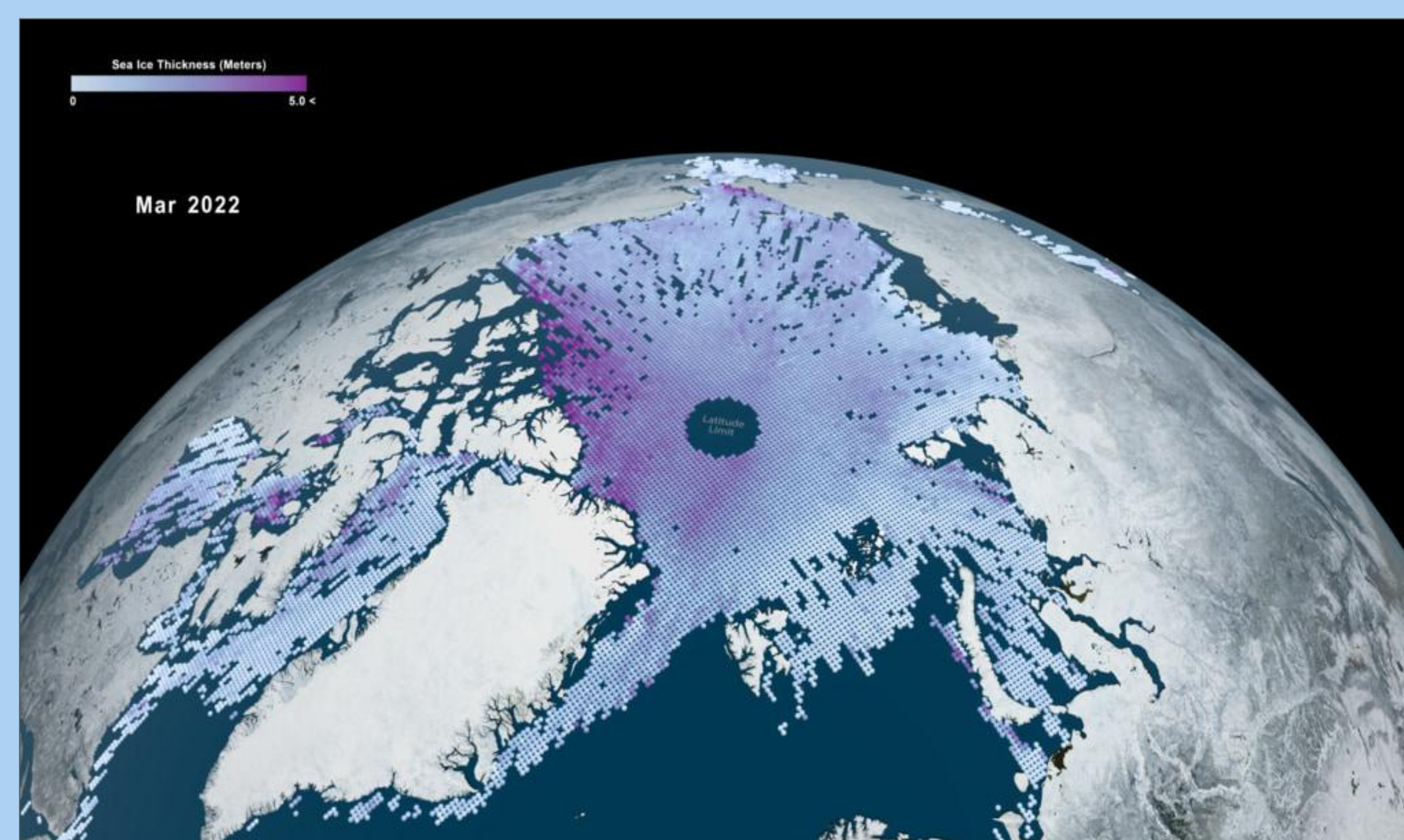


Figure 4. ICESat-2 measurements reveal the thickness of very thin sea ice, giving critical information for evaluating polar region evolution

Ice, Cloud, and Land Elevation Satellite-2 (ICESat-2) Quick Look Products

- Quick-look data available for: Sea ice height, land and vegetation height, atmospheric layer characteristics, sea ice freeboard, and inland surface water height
- Expedited latency: From 45 days to ~3 days
- **Applications include sea ice forecasting, biomass fluctuations, land-surface deformation, surface water and flooding**

Access ICESat-2 quicklooks!



Open Science and Solution Development

- NASA's Earth Science Division has released policy document SPD-41a outlining requirements and guidelines for making scientific information (including publications, data, and software) publicly available
- The SNWG Management Office is integrating open science into its program structure:
 - **All newly funded SNWG projects must adhere to open source science requirements** in alignment with NASA's Earth Science Division policy document SPD-41a
 - Existing SNWG projects are encouraged to adhere to open source science requirements on a best-effort basis

Explore all 47 global products... and more!



- SNWG Earthdata search portal
- Direct access to 47 global datasets related to SNWG solutions
- 67 (and counting!) total datasets



- SNWG solutions page on Earthdata
- Background and current status of each solution
- Links to access available data



- Stakeholder Engagement Program webpage
- Training resources and workshop information for SNWG solutions

Acknowledgments

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