

National Aeronautics and
Space Administration

NASA earth

Thomas Wagner, PhD

thomas.wagner@nasa.gov

Associate Director, Earth Action

Earth Science Division

NASA Science Mission Directorate



Connecting to you



User-Centered



Building Bridges



Scaling





From tiny awards to big projects



My guiding principle

A deep & abiding respect for our investigators & project staff and your ideas.

75% of our formal interactions are giving bad news and every day at work we get told our budgets may be cut.



Talking to you is the best part of our jobs.

Earth Science to Action: an overview

The strategy taps into ESD's end-to-end capability as an open enterprise to incorporate innovation, scientific discovery, and emerging user needs to accelerate the use of Earth science and inform the next iteration of programs, missions, and initiatives.

objectives:

- Holistically observe, monitor, and understand the Earth system
- Deliver trusted information to drive Earth resilience activities

The background of the slide is a satellite-style image of Earth, showing a mix of blue oceans, green and brown landmasses, and white clouds. The NASA Earth logo is overlaid on the right side of the image. The word "NASA" is in a white, sans-serif font, and "earth" is in a larger, white, lowercase sans-serif font.

NASA
earth

Earth Science to Action Strategy



Virtuous Cycle

- User needs inform next iteration of programs, missions and initiatives

Public Understanding & Exchange

- Put more scientific understanding into public sphere
- Deliver applied science to users
- Participate in multi-way info exchange
- Use input to inform subsequent work

Solutions & Societal Value

- Offer models, scientific findings and info through Open-Source Science principles
- Support climate services
- Provide science applications and tools to inform decisions

Earth System Science & Applied Research

- Grow scientific understanding of Earth's systems
- Develop predictive modeling for science applications and tools to mitigate, adapt and respond to climate change

Foundational Knowledge, Technology, Missions & Data

- Technology innovation
- Earth observations missions
- Data collected from space, air and ground



NASA HQ Earth Science Division Leadership



Karen St. Germain
DIVISION DIRECTOR



Julie Robinson
DEPUTY DIRECTOR



Sid Boukabara
Senior Program Scientist, Strategy



Lawrence Friedl
Senior Engagement Officer



Wendy Mihm
Communications Lead

ELEMENTS



Michael Seablom
Associate Director

EARTH SCIENCE TECHNOLOGY OFFICE

Deputy Associate Director
Vacant



Scott Schwinger
Associate Director (Acting)

FLIGHT PROGRAMS

Deputy Associate Director
Antonios Seas



Katie Baynes
Earth Data Officer

EARTH SCIENCE DATA SYSTEMS

Deputy Earth Data Officer
Vacant



Jack Kaye
Associate Director

RESEARCH & ANALYSIS

David Considine
Rotational Deputy

Deputy Associate Director

Lucia Tsaoussi



Thomas Wagner
Associate Director

EARTH ACTION

Deputy Associate Director

Emily Sylak-Glassman



What is the Earth Action (EA) section?

- EA is a new section in ESD that is composed of all Applied Sciences programs/staff plus a half dozen new programs
- New PMs and PSs added to cover new programs
- Focus on synergies—eg commercial data, modeling outputs, etc.
- Increasing mission focus with PALs and activities for more missions
- Connecting across ESD; cross-cutting appointments and other approaches
- Potentially new funding opportunities
- **Amplified focus on meeting societal challenges and co-development, that are the hallmarks of Applied Sciences**
- **Motto: Scale, Build Bridges, User-centered**

NASA earth ACTION



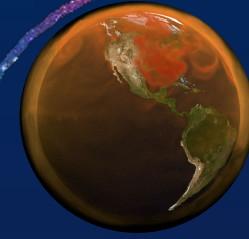
Agriculture



Climate Resilience
& Community Action



Capacity
Building



Greenhouse
Gas Center



Satellite Needs
Working Group



Disasters



Ecological
Conservation



Energy and
Infrastructure



Commercial
SmallSat Data
Acquisition



Earth
Information
Center



Health and
Air Quality



Mission
Engagement

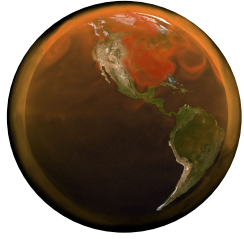


Water
Resources



Wildland Fires

Empowering communities across the world to find solutions to the challenges they face every day.



Greenhouse Gas Center

Multi-agency effort to compile greenhouse gas data from observations and models into a collection of trusted greenhouse gas emissions and flux products.



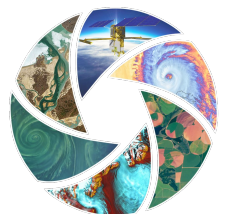
Earth Information Center

Provide actionable, easy-to-use data and information about earth's changing systems to the public.



Satellite Needs Working Group

Partners with Federal agencies to identify high-priority sustained and unmet needs for satellite Earth observations.



Commercial SmallSat Data Acquisition

Identify, evaluate, and acquire commercial small-satellite (SmallSat) data that support NASA's Earth science research & application goals.



EARTH.GOV

<https://www.earthdata.nasa.gov/esds/impact/snwg/solutions>

What do we need from you?

Your ideas, especially:

- Being the engine of innovation in remote sensing to meet societal challenges.
- Connecting w/ users to get needs into our thinking.
- Techniques for developing and sustaining partnerships.

Your concerns, with recognition that we are:

- Trying something new, it won't all go well.
- Expecting and encouraging feedback.

We have incredible opportunities in water.

Your patience and flexibility in:

- Taking a fresh look at how to achieve our objectives.
- Understanding that we face fiscal headwinds.

Recognize that we're one NASA; we all have to work together to address society's challenges.



Operational Products for End-Users from Remote Sensing Analysis (OPERA) Dynamic Surface Water Extent (DSWx)

Background: The SNWG-2018 Assessment found that knowing where surface water exists (lakes, reservoirs, rivers, and floods) multiple times a week would benefit all the U.S. land monitoring SNWG agencies, such as those water resource management and monitoring, and disaster monitoring and response agencies. The near-global DSWx data product suite uses imagery from 5 optical and radar satellites (Harmonized Landsat-8 & Sentinel-2 A/B, Sentinel-1A, and NISAR) to map the spatial extent of surface water on land at 30-m resolution every few days. SAR imagery will aid in mapping surface water extent in cloudy conditions and beneath some vegetation. This SNWG activity is being managed by JPL's OPERA project, who will oversee the development, implementations, and operations. The optical DSWx product was developed in partnership with the USGS.

Societal impact: The DSWx solution provides maps of surface water every few days, enabling flood and drought monitoring, habitat assessment, wetland preservation, and tracking of water use. These applications inform land and water resource management and hazard response and recovery.

In production since Apr. 2023. Products are available from PO.DAAC:

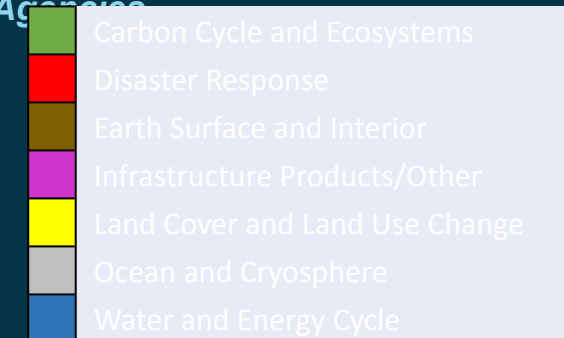
Status: https://podaac.jpl.nasa.gov/dataset/OPERA_L3_DSWX-HLS_PROVISIONAL_V1

L_V1



Thematic Areas and Needs

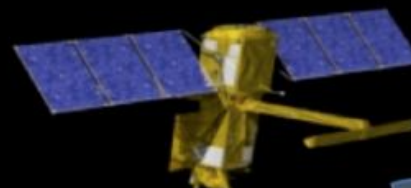
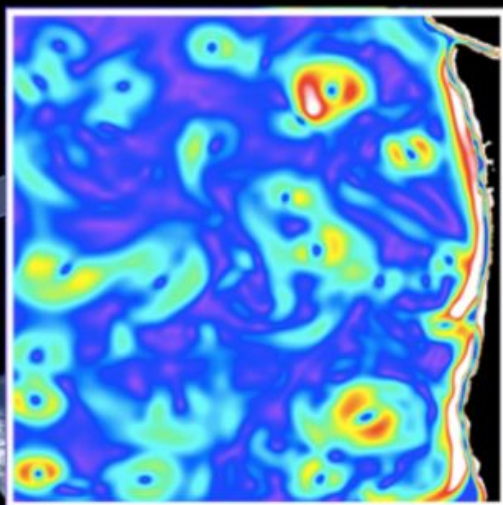
SNWG-2022: 19 Needs across 12 Agencies



Links

- [OPERA DSWx website](#)
- [OPERA DSWx on Worldview](#)
- [OPERA DSWx Guide on PO.DAAC](#)
- [OPERA DSWx applications Github](#)
- [OPERA workshop on July 19](#)

High resolution products



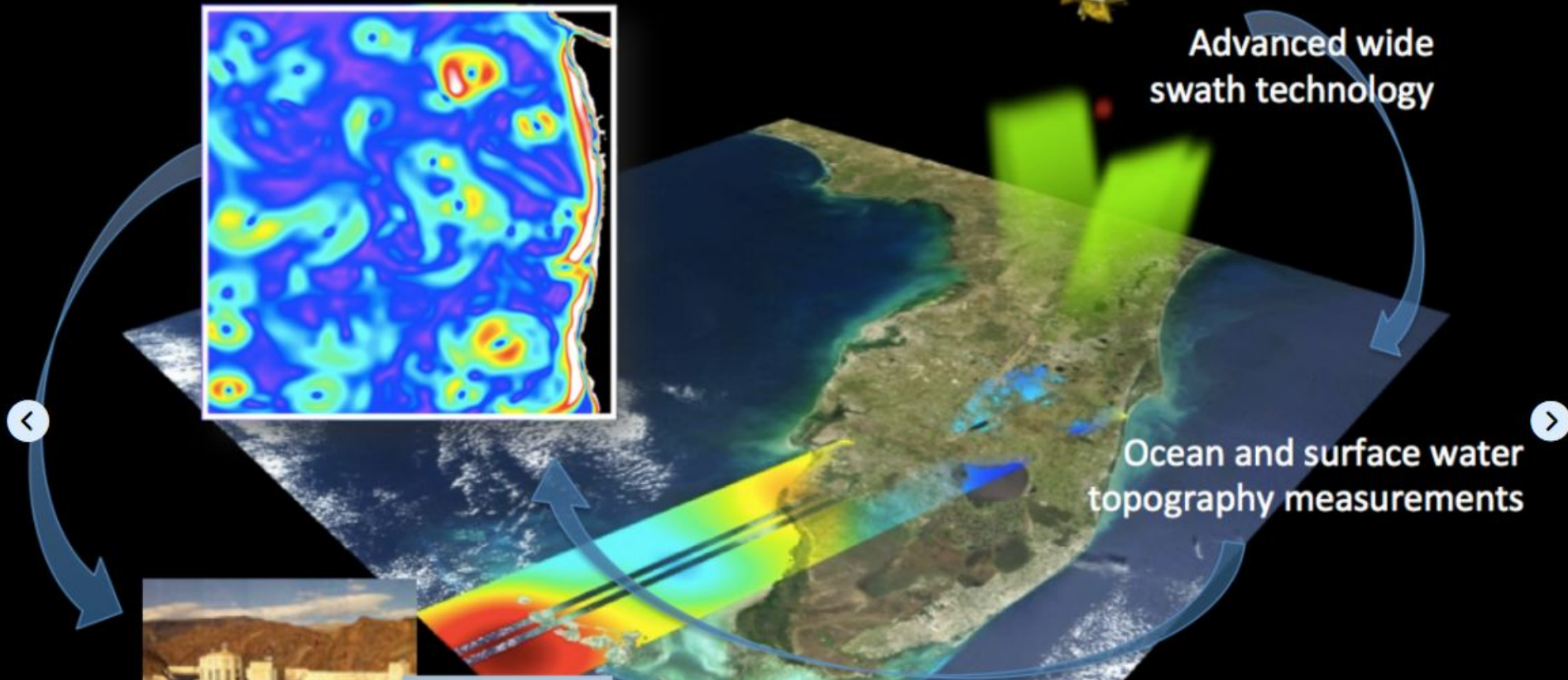
Advanced wide swath technology

Ocean and surface water topography measurements



Supporting societal need

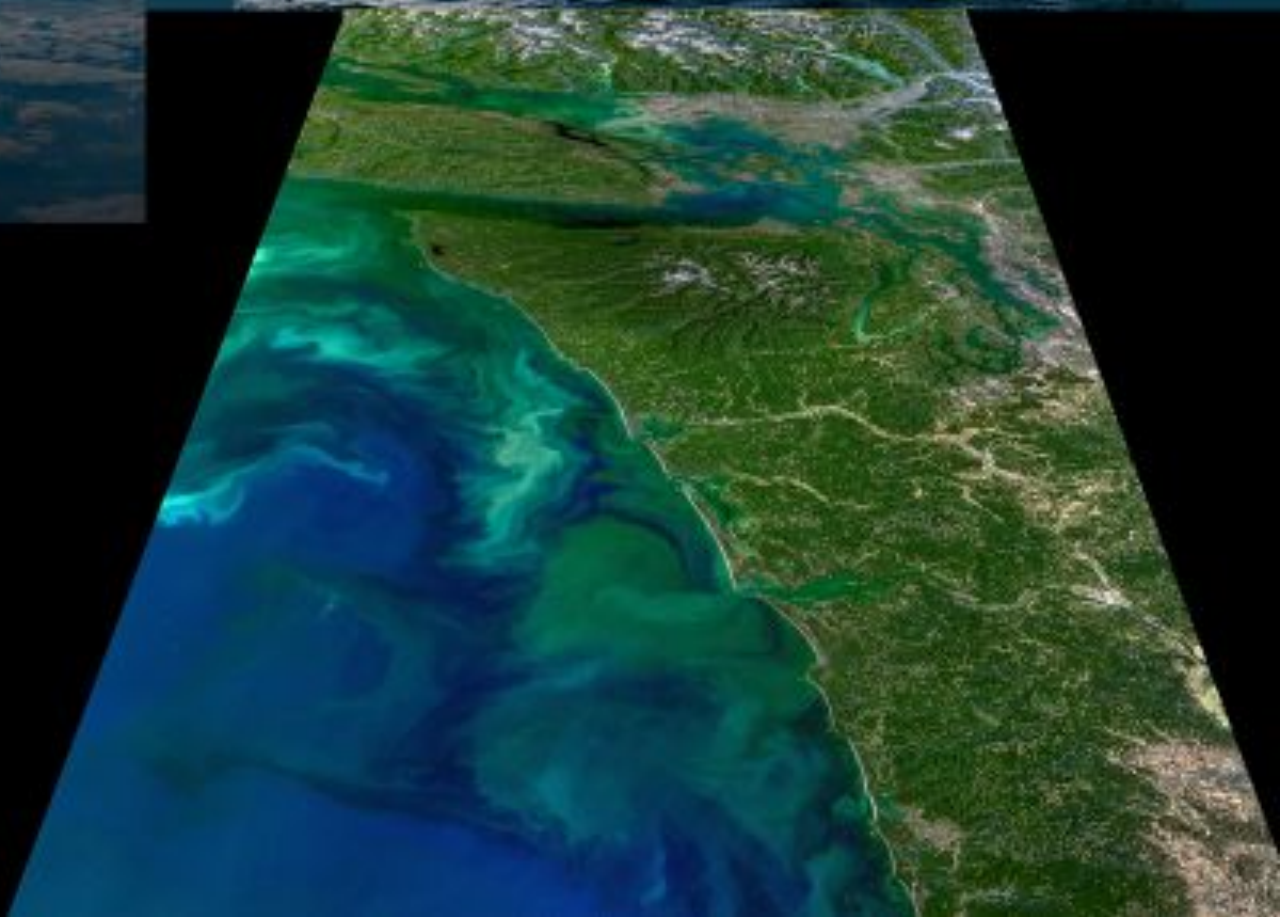
SWOT
SURFACE WATER & OCEAN TOPOGRAPHY





PACE Advances Ocean Science

- Monitor fisheries
- Respond to toxic algae blooms
- Key ocean and atmosphere data for forecasting air quality and weather that will improve our understanding of Earth's climate





NISAR will map surface soil moisture globally every 6 to 12 days at 200m* (*Sahara at 500m)

NASA-ISRO SAR (NISAR)

Measuring Earth's changing ecosystems, dynamic surfaces, and ice masses to provide information about biomass, natural hazards, sea level rise, and groundwater with a host of applications.

What do we need from you?

Your ideas, especially:

- Being the engine of innovation in remote sensing to meet societal challenges.
- Connecting with users to get their needs into our thinking.
- Techniques for developing and sustaining partnerships.

Your concerns, with recognition that we are:

- Trying something new, it won't all go well.
- Expecting and encouraging feedback.

Your patience and flexibility in:

- Taking a fresh look at how to achieve ES2A objectives.
- Understanding that we face fiscal headwinds.

Recognize that we're one NASA; we all have to work together to address society's challenges.





NASA
earth

science.nasa.gov/earth

Your Home. Our Mission.