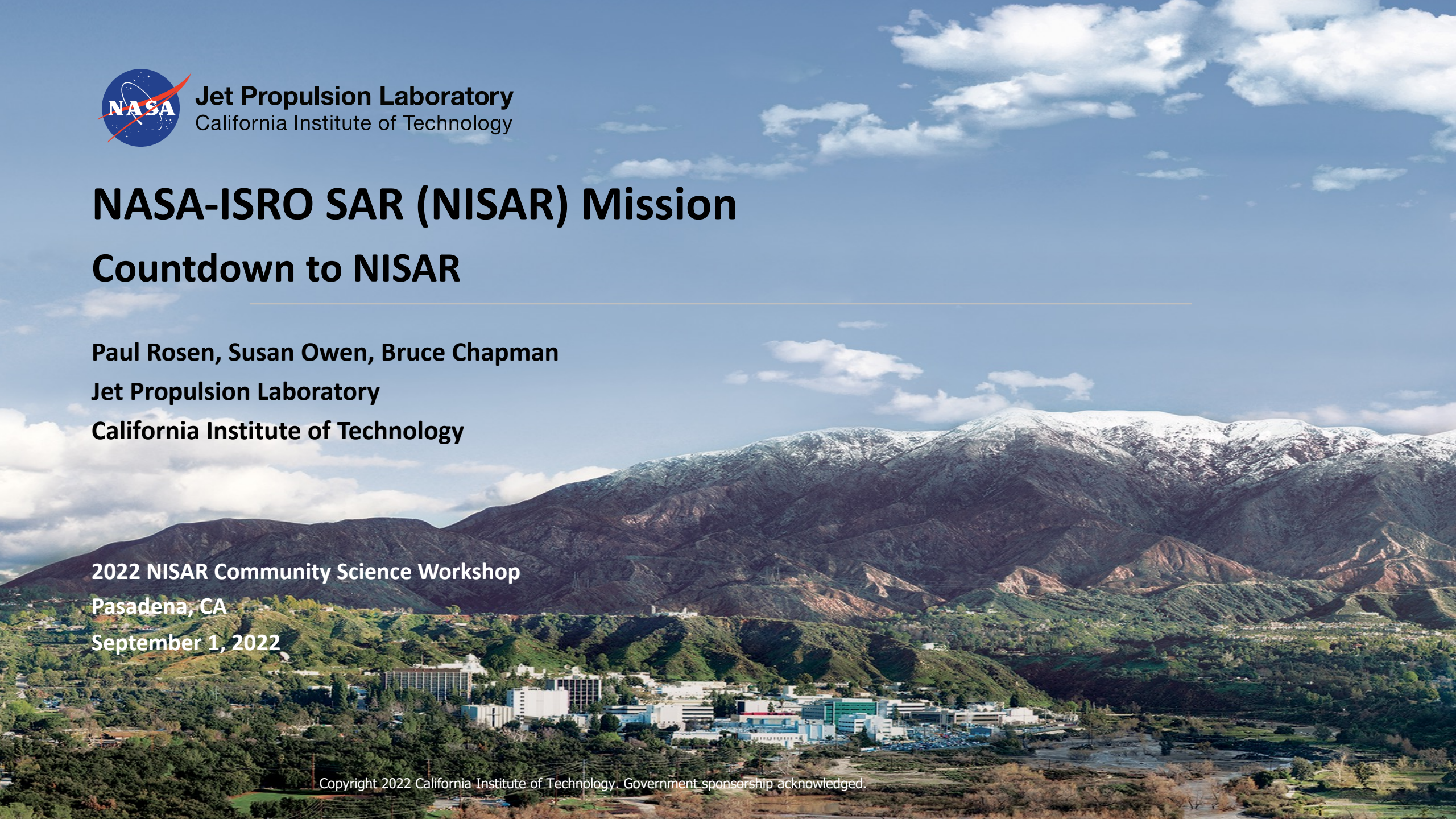


Jet Propulsion Laboratory
California Institute of Technology

NASA-ISRO SAR (NISAR) Mission

Countdown to NISAR

Paul Rosen, Susan Owen, Bruce Chapman
Jet Propulsion Laboratory
California Institute of Technology

2022 NISAR Community Science Workshop
Pasadena, CA
September 1, 2022

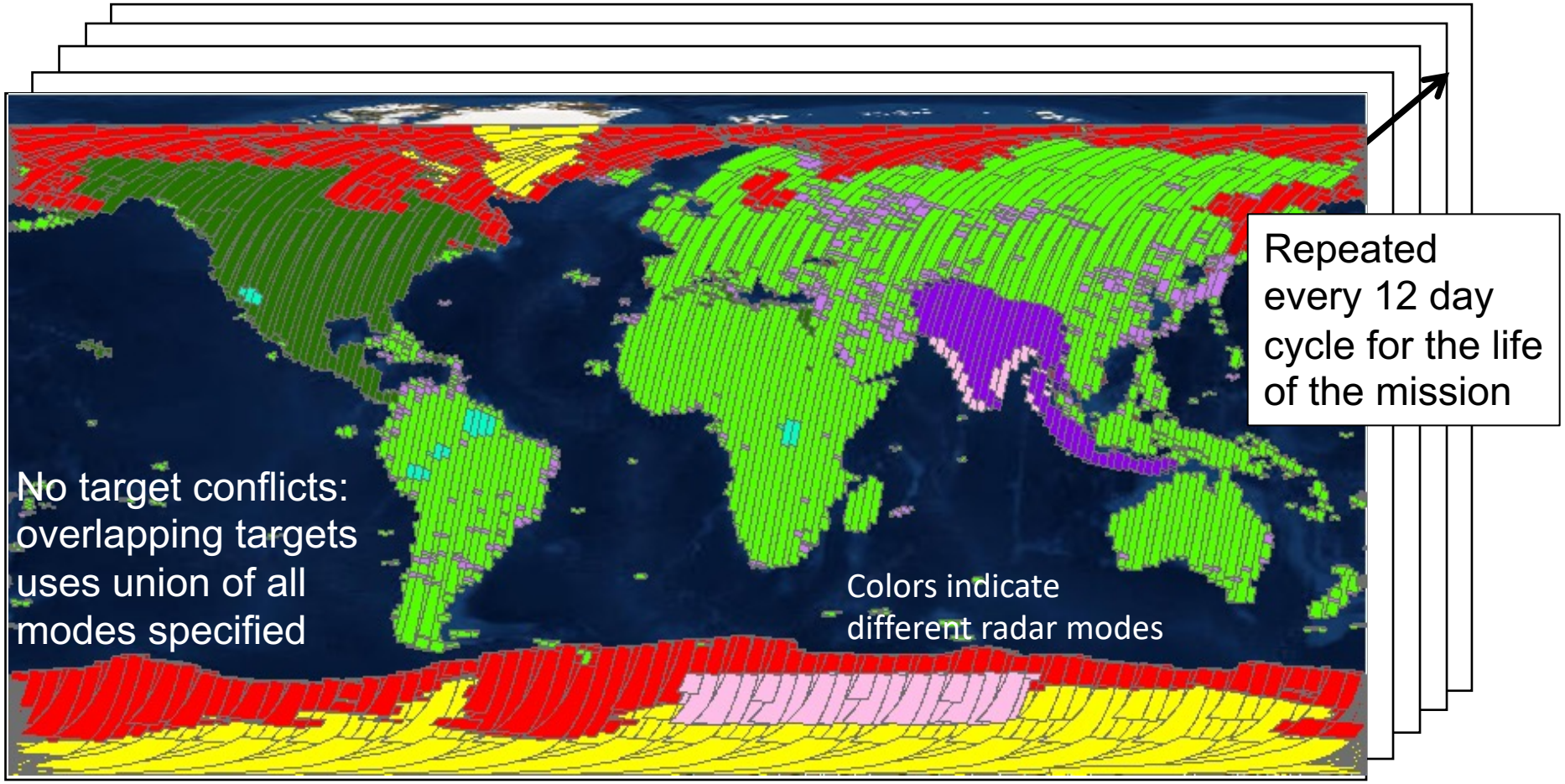
Countdown to NISAR Outline

- What is happening on the project between now and launch, and beyond?
- How can the community get ready?
- How can the community get involved?

Countdown to NISAR
Here before you know it!

Current Launch Planned Date: January 30, 2024

NISAR Systematic Observations

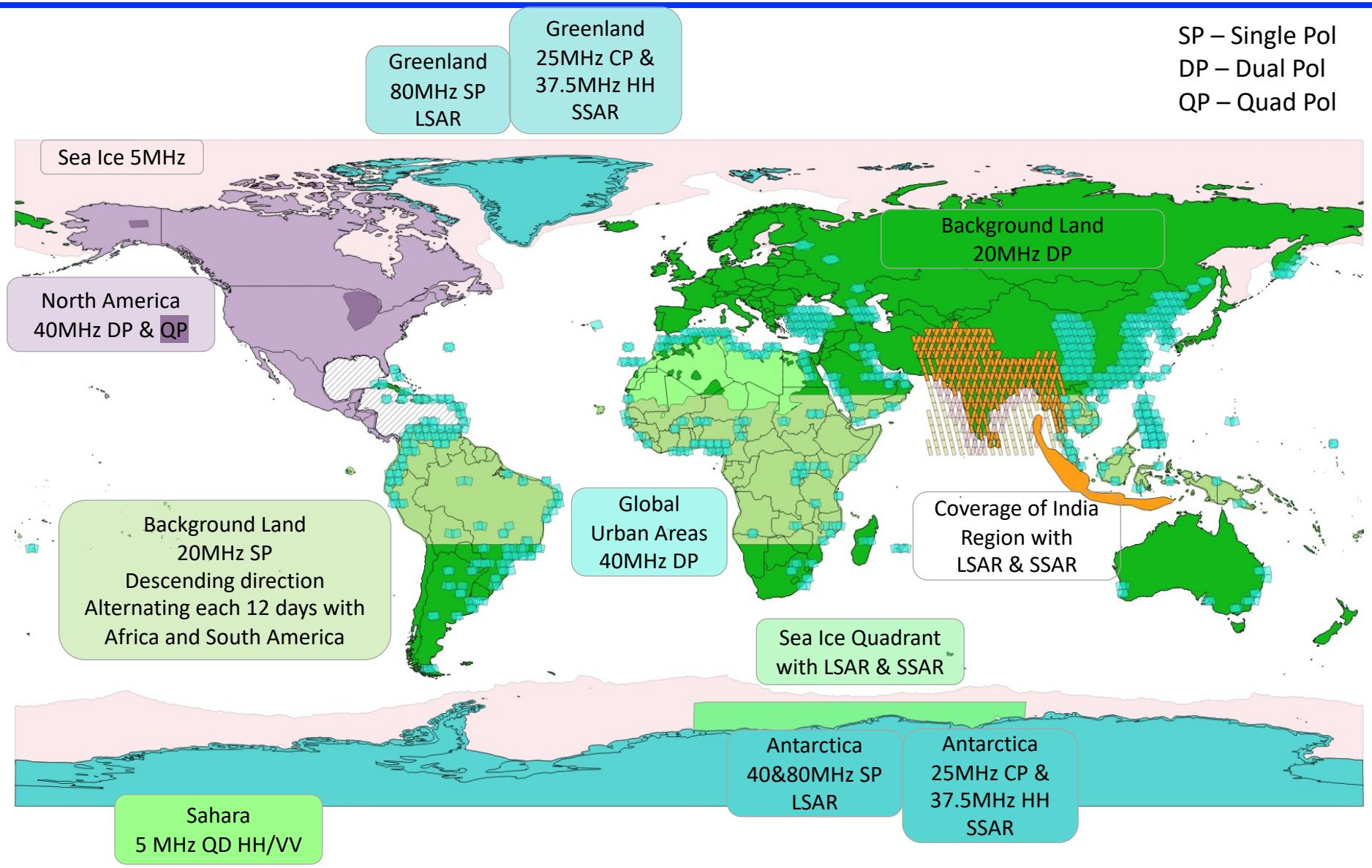


J. Doubleday
P. Sharma, JPL

Persistent updated measurements of Earth 1.6 PB raw data per year
Level-2 global products

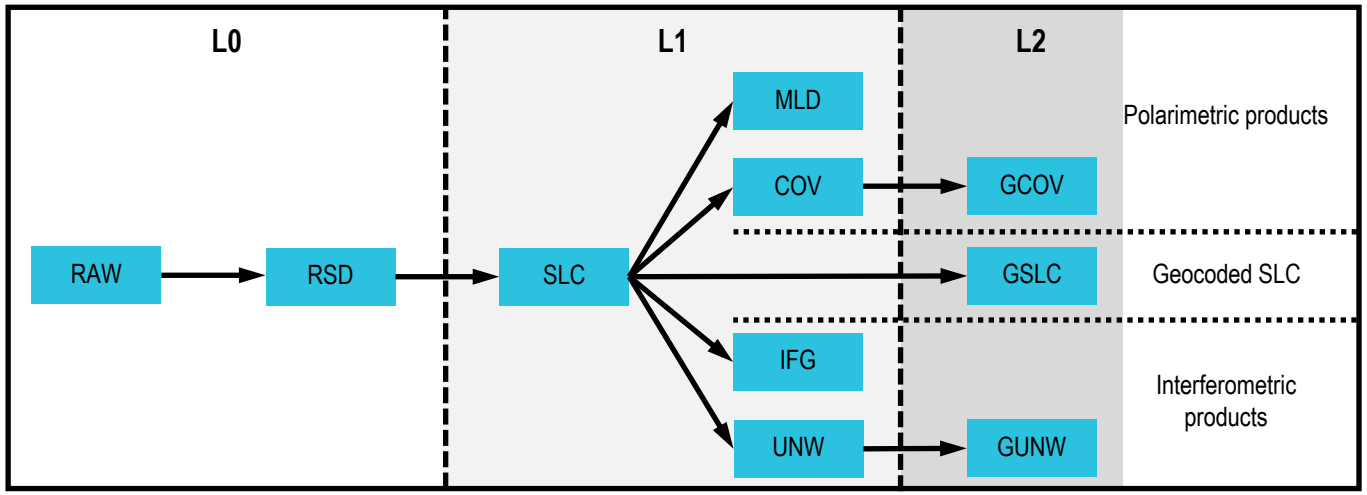
Current Observation Plan Revised every 6 months

SP – Single Pol
DP – Dual Pol
QP – Quad Pol



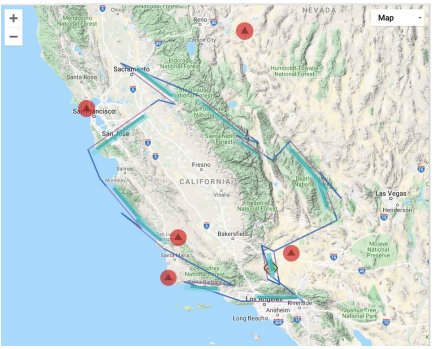
Science Data System Summary

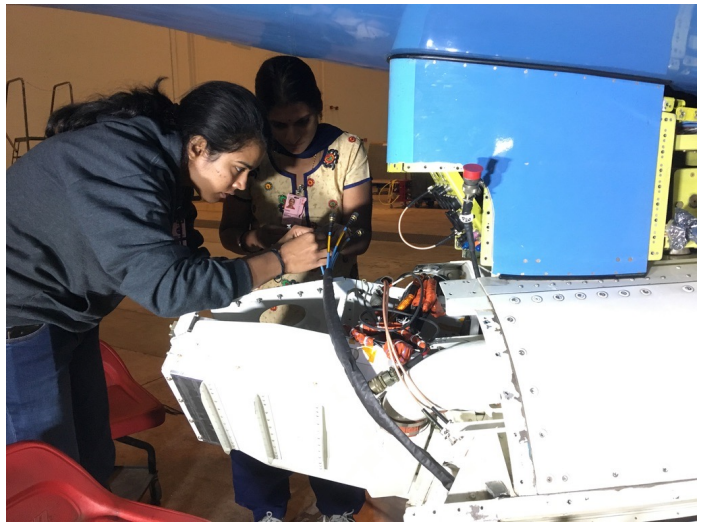
- Ingest 35 Tbits (4.4 TB) of raw data per day on average
- Automatically generate L-SAR L0a, L0b, L1, and L2 science products (> 70TB/day)
  - Generate S-SAR L0 science product for data downlinked through NASA Ka-band
- Perform bulk reprocessing twice during mission
  - 8 months of data after L2 product validation at 4x rate
  - 12 months of data at end of mission at 3x rate
  - Anticipate assessing additional processing / reprocessing options before launch
- Sample products derived from UAVSAR data, processed like NISAR, are available
  - https://uavsar.jpl.nasa.gov/science/documents/nisar-sample-products.html
- Open source (github) ISCE3 software already available, support these workflows and products



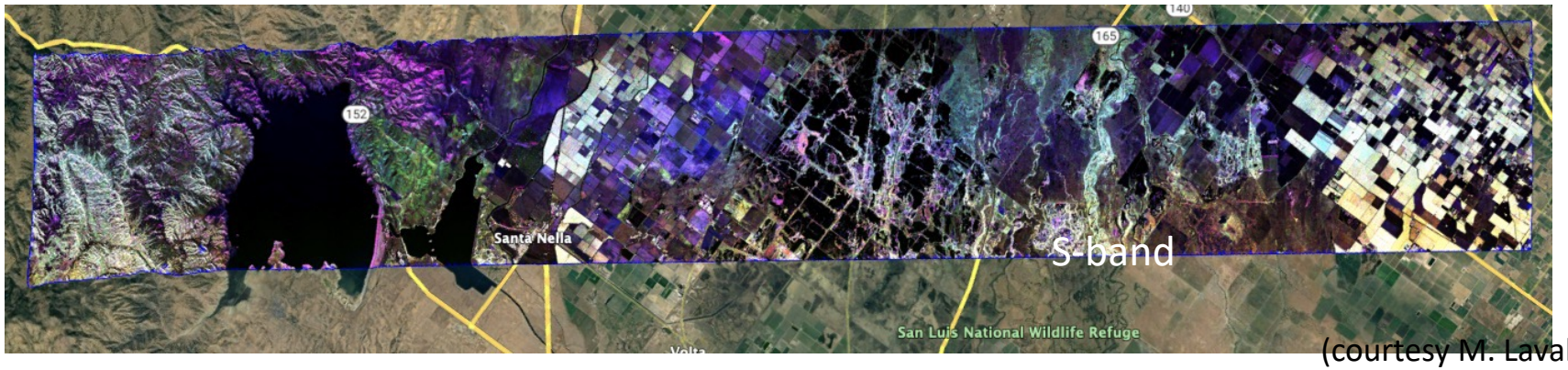
ISRO ASAR L+S Band Airborne Testbed on UAVSAR Platform

- 150+ L+S band polarimetric data sets from US ASAR Airborne campaigns over a range of NISAR science-related targets: Agriculture, Soil Moisture, Forests, Glaciers, Sea-ice, landslides
- 2019 Western Campaign
- 2021 East Coast Campaign
- Data Sets available at ASF DAAC





ASAR geocoded products generated through NISAR L2 processor

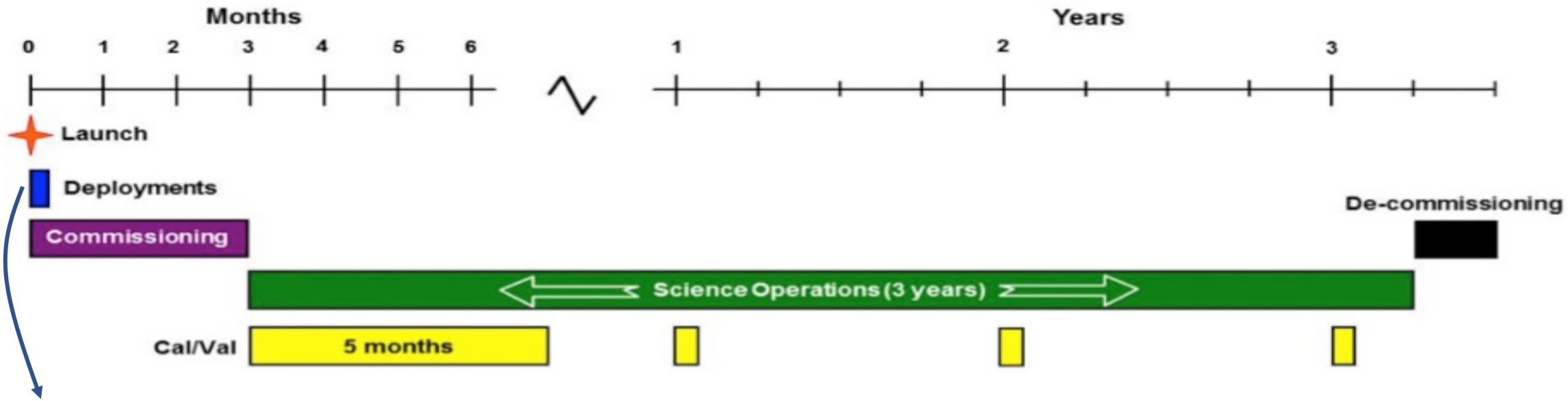


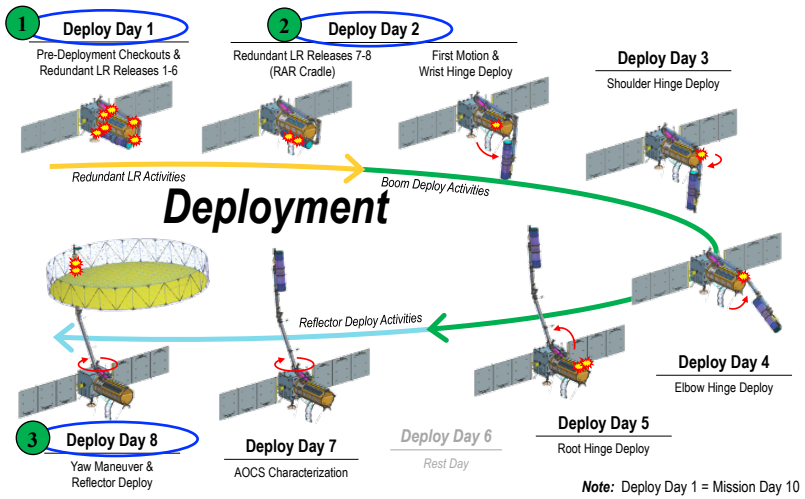
(courtesy M. Lavalle)

Current Status and Upcoming Events

- All payload electrical & mechanical integration is complete; dynamic testing is underway (Aug 2022)
- Mission Scenario Tests in April demonstrated end-to-end system functional performance
- 3 of 4 NISAR Ka-band ground stations are operational, 4th will be operational by end of year
- After dynamic testing:
  - Aug 2022 – Oct 2022: Thermal/Vacuum Testing Launch Configuration
  - Nov 2022 – Jan 2023: Thermal/Vacuum Testing Science Configuration
  - Jan 2023 – Feb 2023: Pack and ship to India
  - Mar 2023 – Dec 2023: Integrate with spacecraft
  - Dec 2023 – Jan 2024: Launch operations

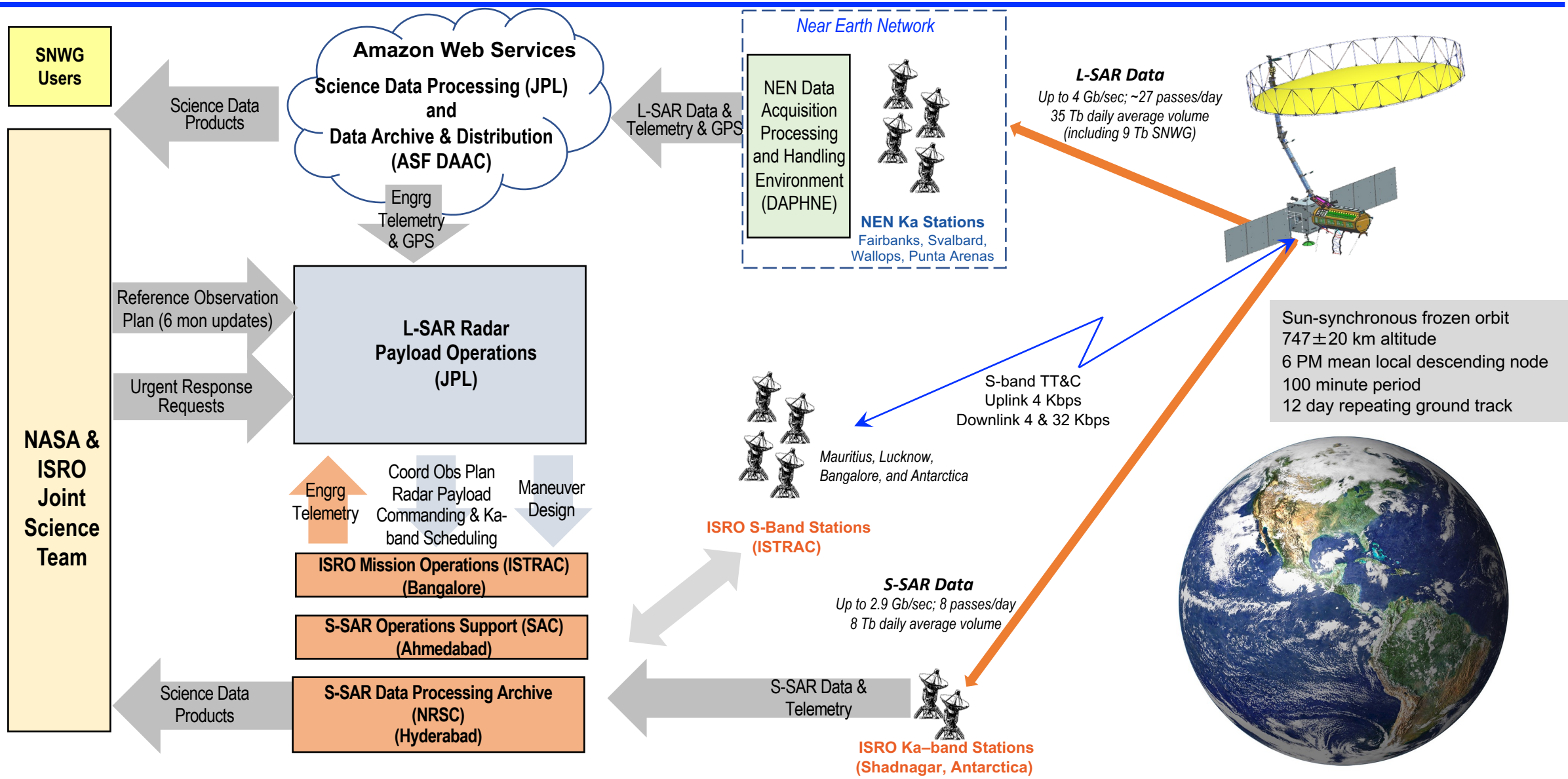
What happens after launch?



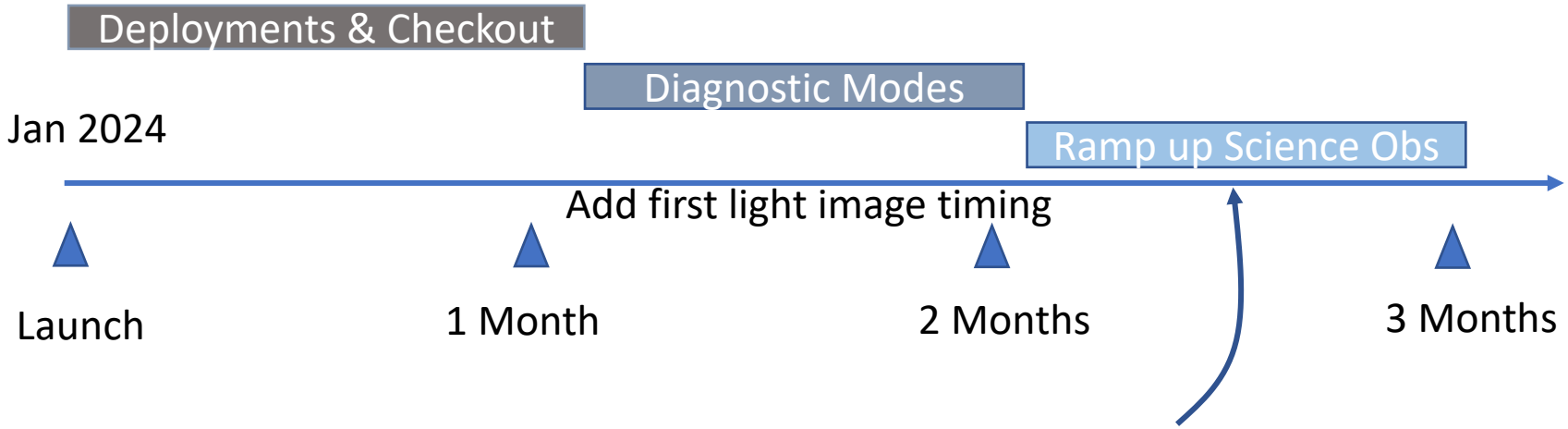


- Three-month Commissioning Phase
- Three Year Baseline Science Operations
  - Five years for ISRO
- Five-month Cal/Val Phase overlaps with Science Ops
- Periodic Cal/Val throughout
- Science Operations extended pending NASA Senior Review

NISAR Operations Overview



Commissioning Activities



- Science mode imaging observations are planned to begin about 2 months after launch, ramping up to full mission cadence in the science observation plan
- In this period, science team will be working with processing team to evaluate the image quality and initial science results
- Data will be roughly calibrated based on lab measurements and diagnostic mode updates
- Data will be available to the science community for evaluation through the Alaska Satellite Facility DAAC and ISRO DAAC (no planned period of exclusion)

- Exact dates of commissioning observations continue to evolve, and will be adjusted based on execution successes (earlier or later)

Post-commissioning Cal/Val Phase

- For 5 months after commissioning, the science team will continue to evaluate calibration stability and validate science measurement and overall performance
- All data available to the science team will also be available at the ASF DAAC
- Based on initial results *by science team and the community*, there may be recommendations to revise the science observation plan.
  - Revisions are planned on a six-month cycle
  - Two months to collect inputs (in this cycle, five months after launch)
    - The NISAR Project will hold a workshop to collect inputs
  - Two months for evaluation and reconciliation of requests
  - Two months to execute the changes to the plan
- Science community workshop / engagement cycle will follow this cadence
- Note: Observation Plan has been thoroughly vetted by science team – further changes expected to be small

Summary

- Global products to Level 2 fully and openly available to the global community
- Cloud-based data, tools and services to facilitate access and use
- Sample data sets for you to practice
- Anticipated launch of NISAR in 2024
- Join us in getting ready for NISAR!

For more information: ***https://nisar.jpl.nasa.gov***

Countdown to NISAR - Cal/Val

Bruce Chapman

Jet Propulsion Laboratory

California Institute of Technology

NISAR Science Community Workshop
Pasadena, California, September 1, 2022

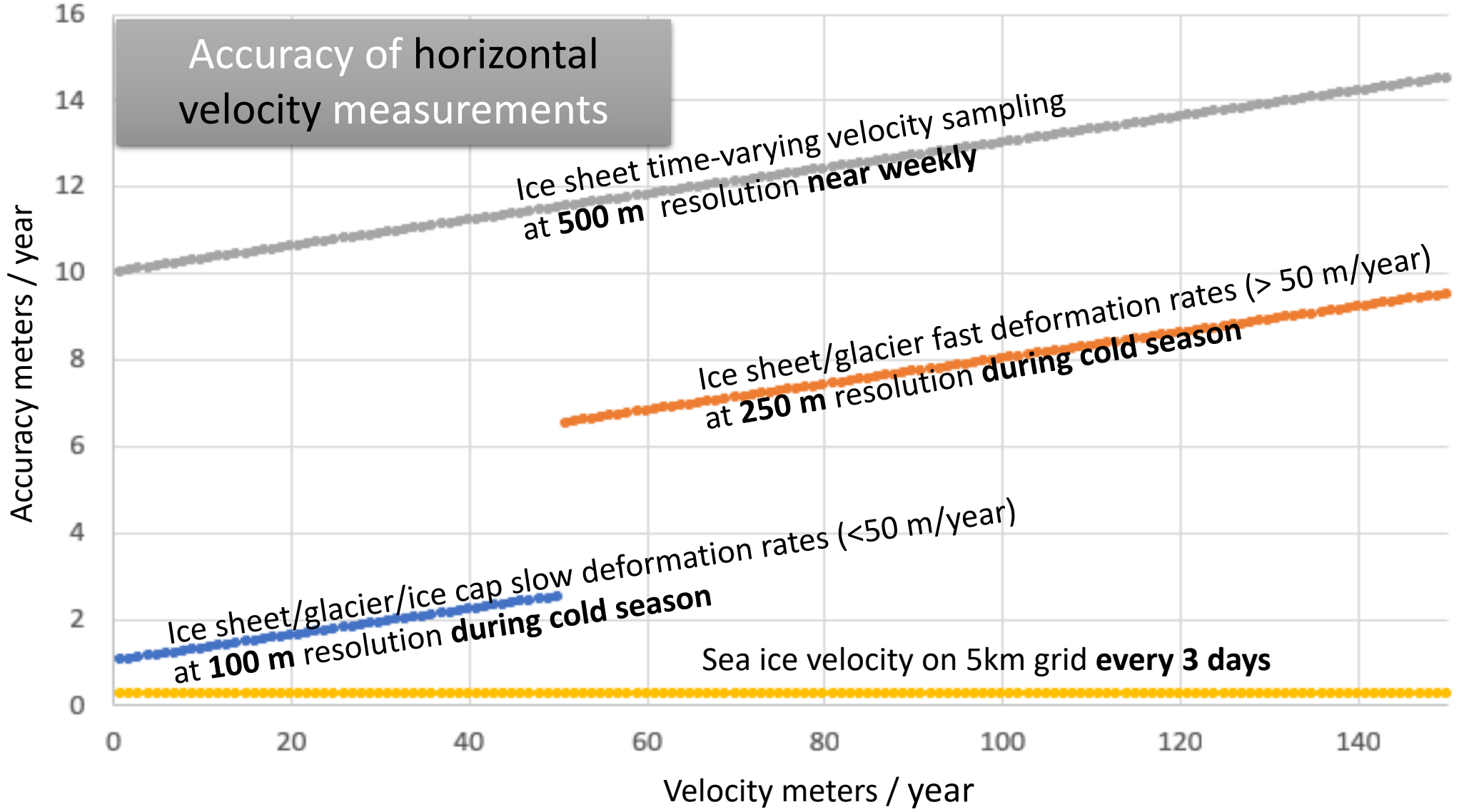
NISAR Cal/Val

- Multiple measurement requirements across **three science disciplines** must be validated by comparing NISAR science products or results against "Truth" (usually measured on the ground).

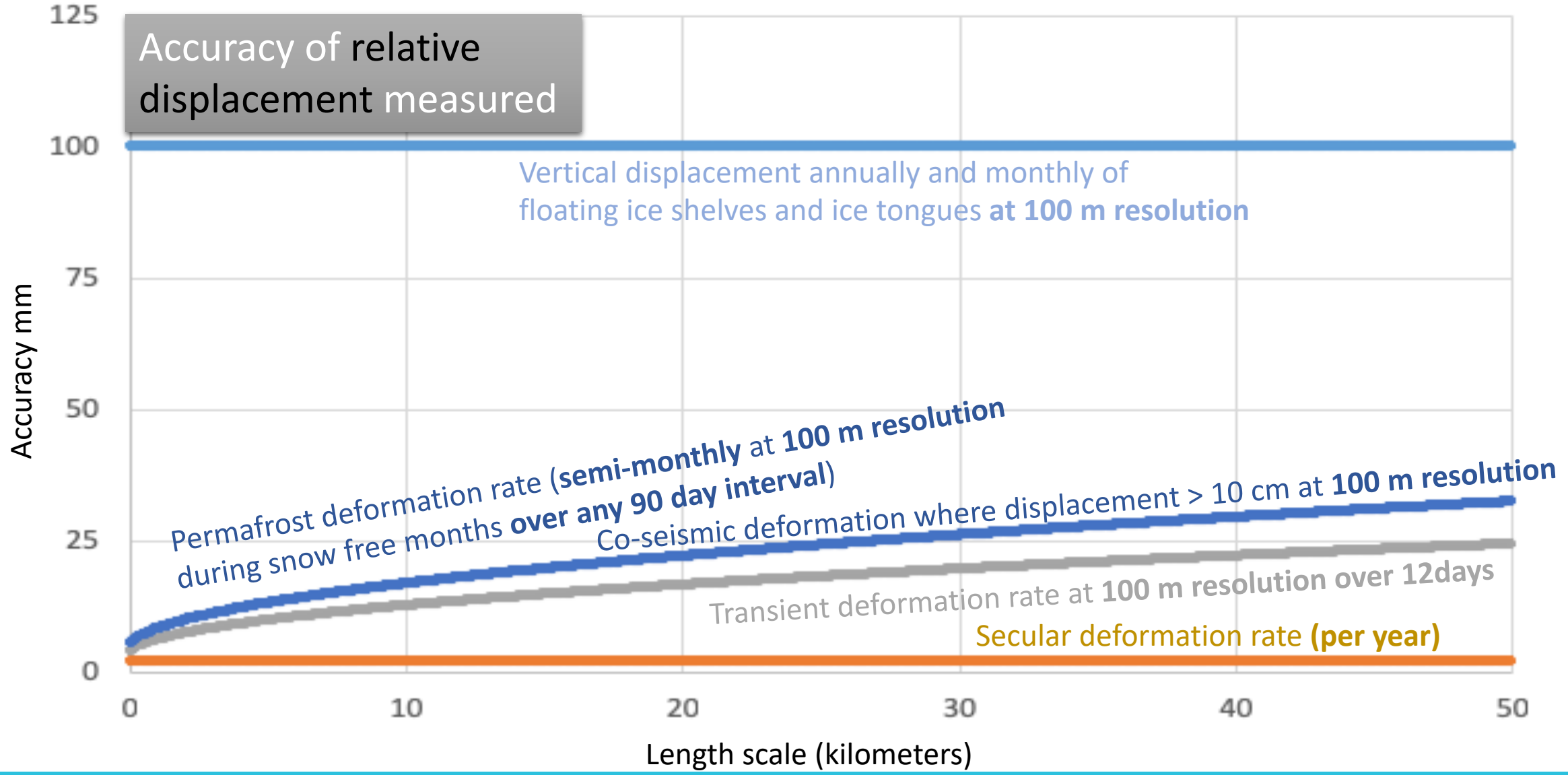
- These requirements will be validated at **specific Cal/Val sites** identified in the NISAR Cal/Val plan.

- The NISAR science team is developing the NISAR science products or results that will demonstrate NISAR can meet its requirements.
  - The "Truth" products are often produced by the science community at large.
- Validation data - other than commercial or otherwise restricted products (that will be referenced to their source) - will be publicly and freely available either at a DAAC or other long term data facility

NISAR Science Requirements
Cryosphere

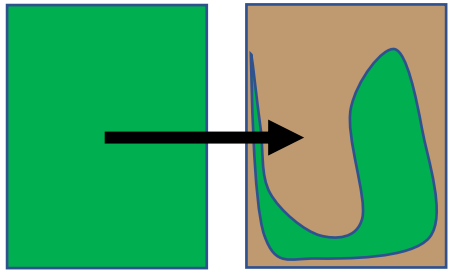


NISAR Science Requirements
Solid Earth and Cryosphere



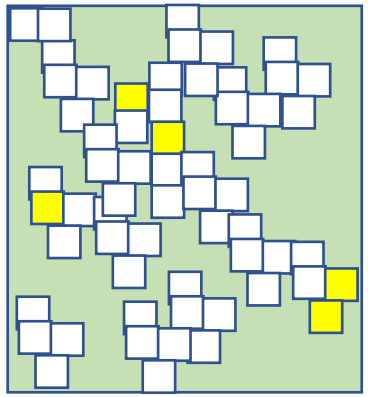
NISAR Science Requirements
Ecosystems

Detection of Forest disturbance



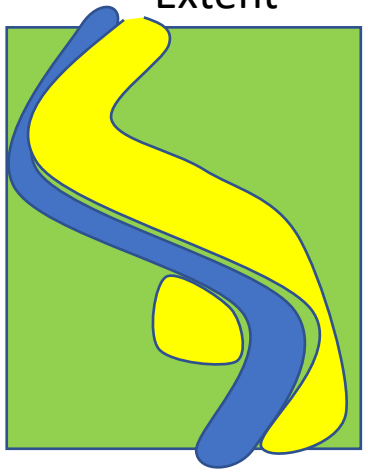
Accuracy: > 50% disturbance at ha scale, **annual product**

Active agricultural crop area



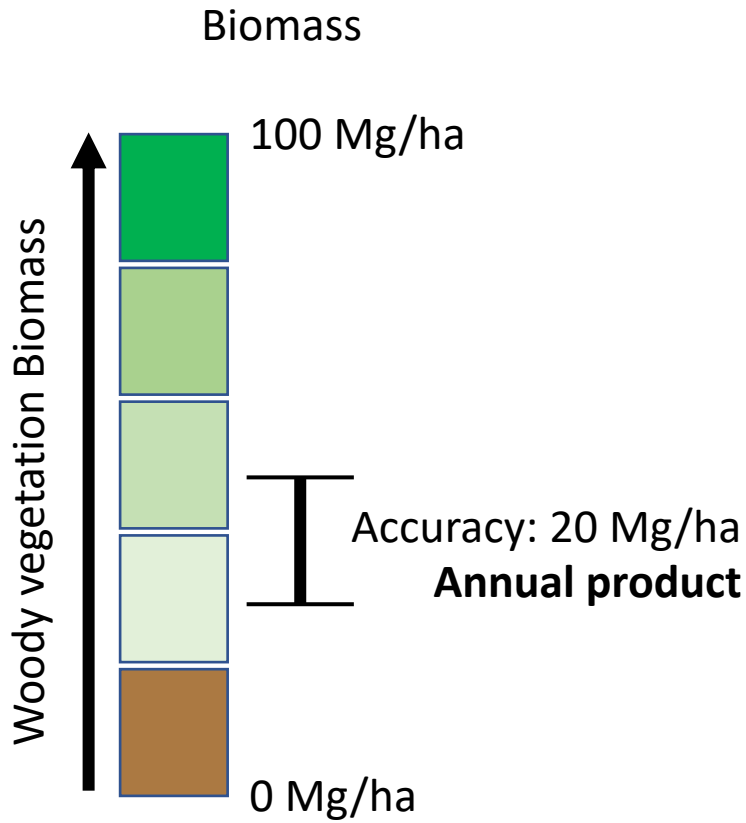
Accuracy: 80% at 1 ha resolution
every 3 months

Wetland inundation Extent



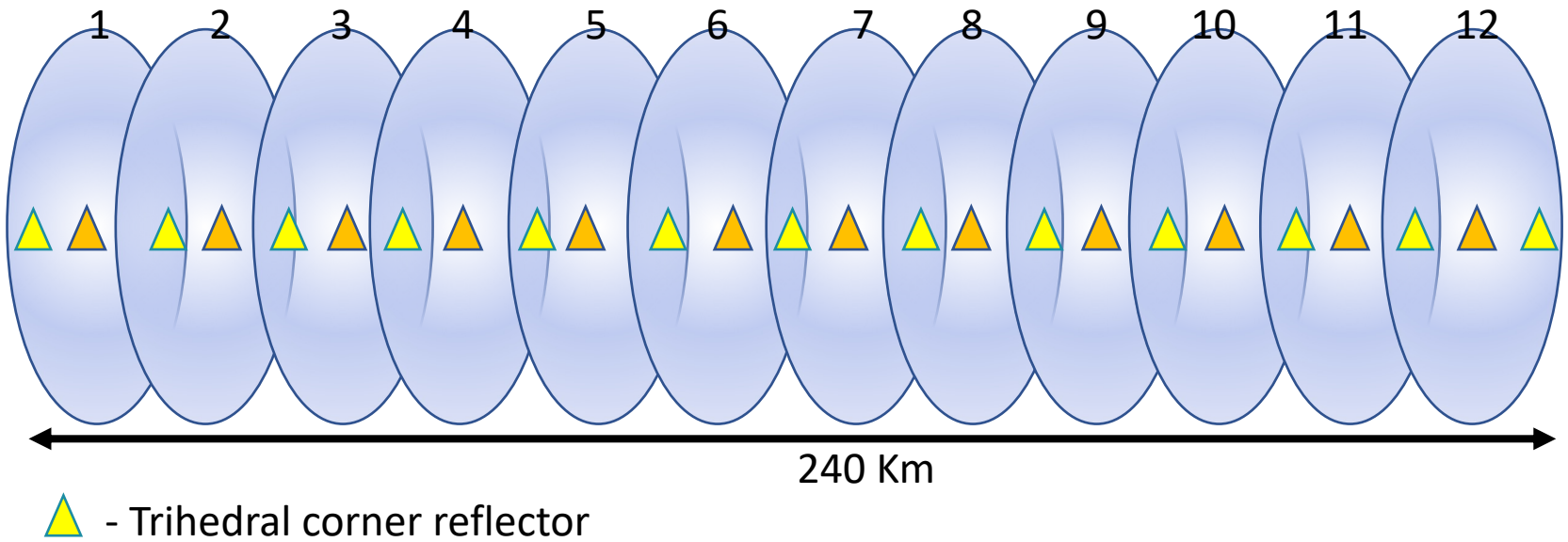
Accuracy: 80% at 1 ha resolution
every 12 days

Accuracy of Ecosystem Requirements



L-band image Calibration

- NISAR will have 12 sub-beams
- An onboard digital beamforming algorithm will be used to form the NISAR 240 km range swath

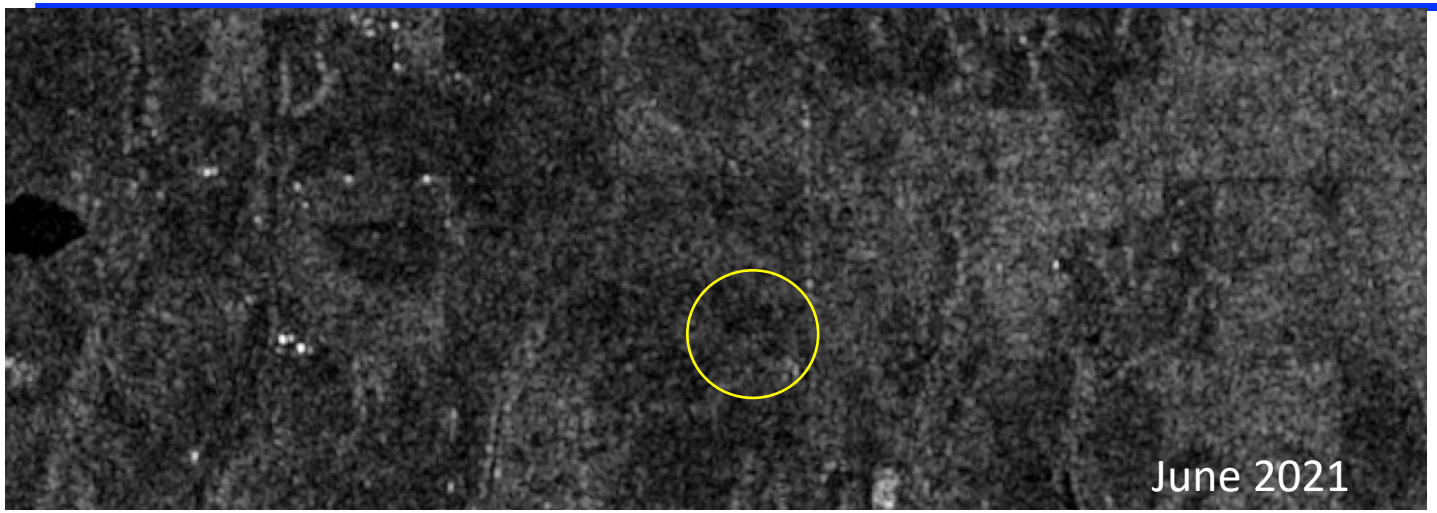


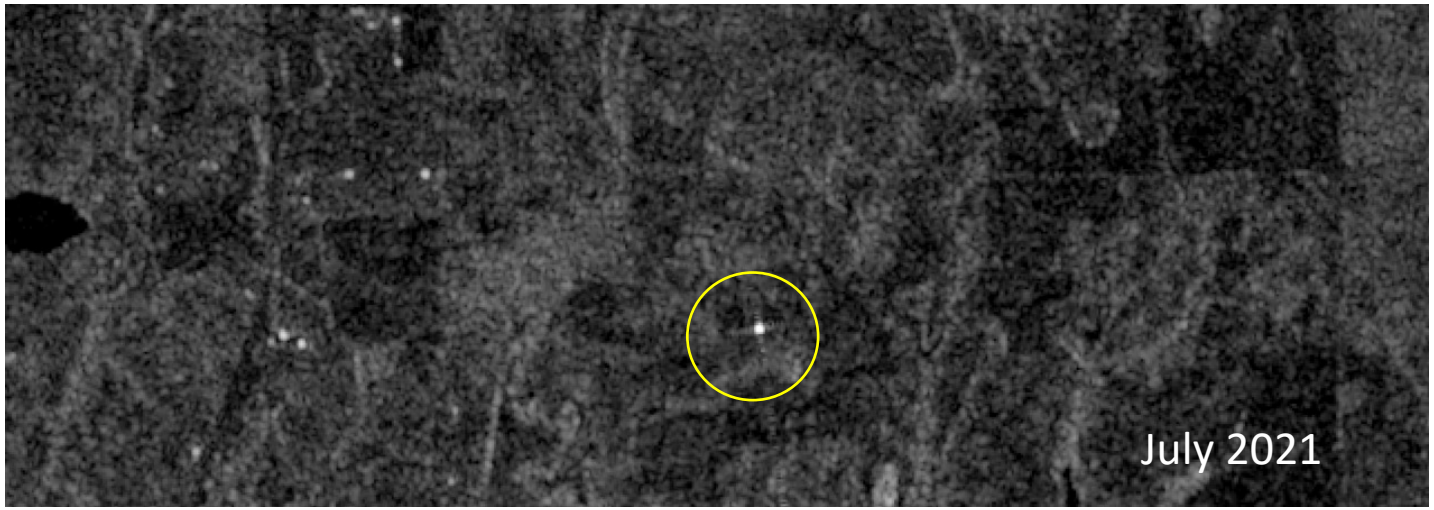
- Reflectors will be deployed at the edge of each sub-beam in beam overlap areas
- Reflectors will be deployed at the middle of each sub-beam
- Due to swath overlap of adjacent swaths, some reflectors can be image more than one of these locations
- Bright distributed targets will be also used to evaluate the calibration across the sub- beam overlap areas
- Reflectors will be deployed in Oklahoma and Alaska
- NISAR will image these sites in Quad-Pol mode

Image Calibration sites

(Observed in Quad-Pol mode at L-band, Compact-Pol mode at S-band)

Corner Reflectors in Oklahoma





Sentinel-1 C-band VV

Alaska

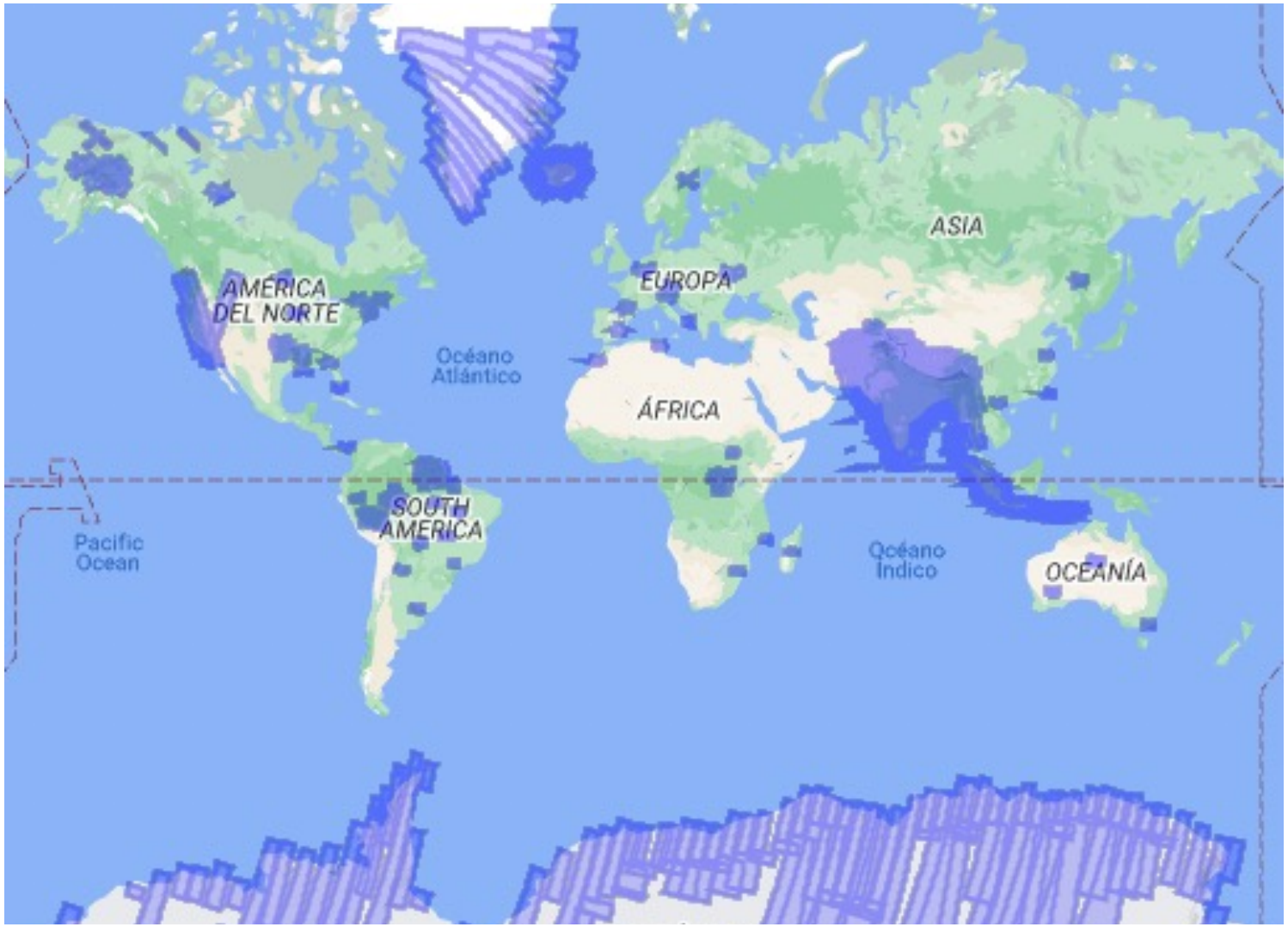
N03K 2.8 m reflector

Barton Farm, Clinton, Oklahoma

NISAR Cal/Val sites for science measurements

- Ecosystems - Biomass
- Ecosystems - Crop Area
- Ecosystems - Inundation
- Solid Earth
- Solid Earth - Permafrost
- Cryosphere

Location of planned joint L/S band observations in one 12-day orbit cycle



Shown is about 100 Tb of raw SAR data that will be downlinked every 12 days

-- Many of the Cal/Val sites are jointly imaged by L-band and S-band ---===

UAVSAR

NASA Armstrong's C-20A (flight identifier: nasa802)

NASA Johnson's G-3 (flight identifier: nasa992)

- UAVSAR is a NASA L-band fully polarimetric SAR that has been in operation since 2009
- UAVSAR will be flown after launch over ecosystem and solid earth deformation sites to help validate NISAR science measurement requirements with its fully polarimetric high-SNR L-band SAR data.
- For more information, visit uavsar.jpl.nasa.gov

Types of validation measurement to be made

- GPS coordinates from GNSS stations to derive surface velocity and displacement
- GPS coordinates from sea ice buoys.
- Forest biomass derived from airborne LIDAR and field measurements of forest characteristics, GEDI forest height and biomass
- Selected UAVSAR quad pol and repeat pass InSAR data
- Water level to interpolate inundation extent
- Crop surveys to identify crop type, planting/harvest dates
- Soil moisture measurements
- Very high resolution optical satellite data

How can I contribute to NISAR Cal/Val?

1. Contact for additional information bruce.chapman@jpl.nasa.gov

I can try to connect you with project or science team members that might have similar Cal/Val interests, or try to answer any questions you may have.

This work was performed at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

How can I contribute to NISAR Cal/Val?

2. Let us know if you or someone you know is an excellent student that would like to apply to intern at JPL and possibly directly participate in our Cal/Val activities.

Starting next year, I plan to select a small number of applicants to the JPL summer student internship program to work on NISAR Cal/Val – before launch to gather ancillary data and produce prototype science products; then after launch to help validate the measurement requirements.

https://www.jpl.nasa.gov/edu/intern/apply/summer-internship-program/

Let me know if you or a student of yours applies.

How can I contribute to NISAR Cal/Val?

3. If you plan to study or collect data at any of our Cal/Val sites -

- you could volunteer to report back on any local disturbances or events - or report back on your regularly collected measurements.

- or if there is a site you are studying but don't travel to, you could examine other remote sensing data and report back regarding any disturbances or events or findings that may impact our Cal/Val activities.

These results could be archived with our other validation data sets.

This work was performed at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

How can I contribute to NISAR Cal/Val?

4. There will be an open NASA ROSES opportunity for NISAR after launch, and there may be other relevant ROSES solicitations as well.

Gerald Bawden discussed this topic yesterday morning.

This work was performed at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

How can I contribute to NISAR Cal/Val?

5. Join the NISAR early adopter/Next Gen Users program:

https://nisar.jpl.nasa.gov/engagement/early-adopters/

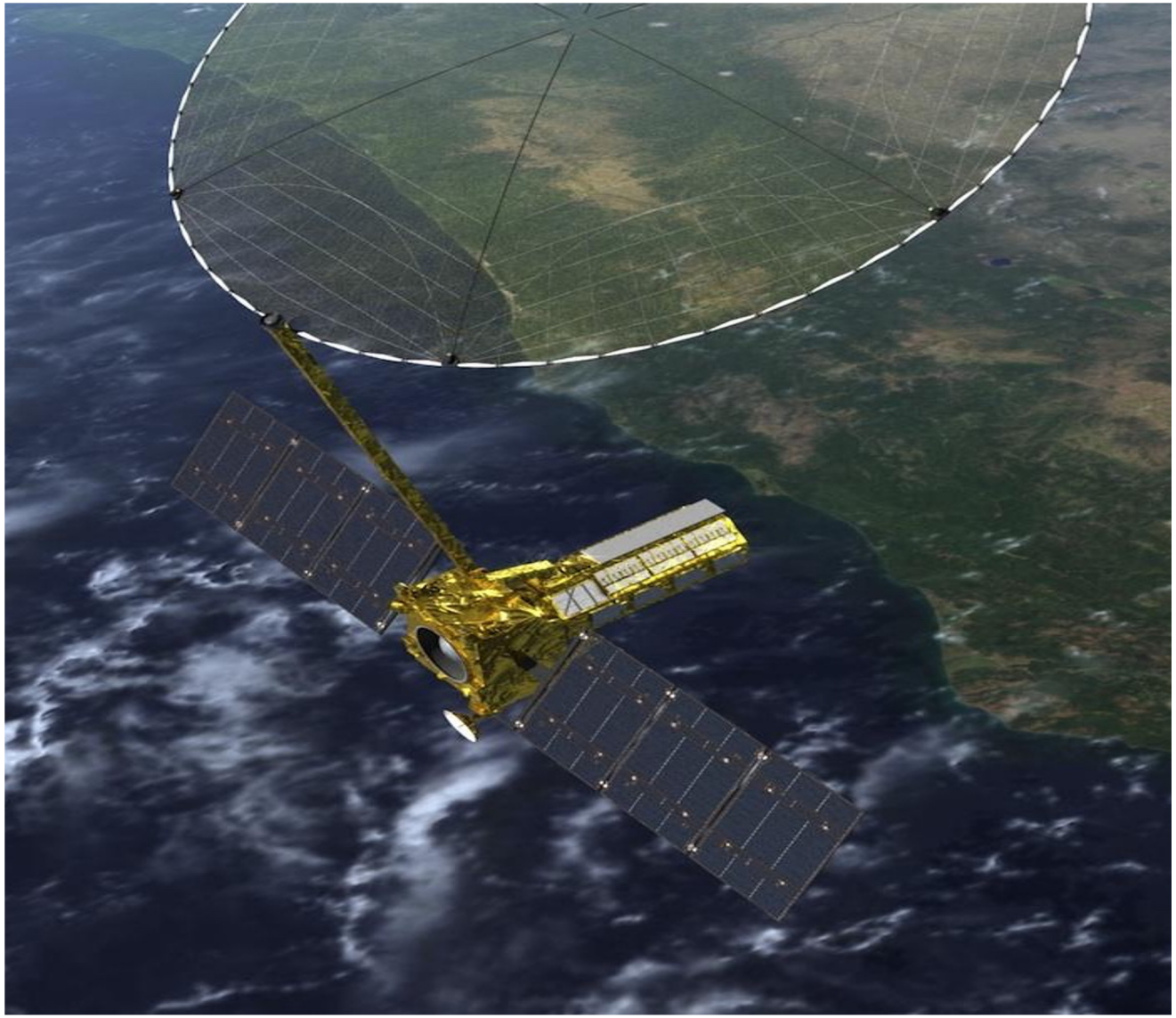
- All the benefits of being a member of the Community of Practice
- Receive invitations to events to learn about the mission and the data
- Showcase your work on the NISAR website
- Get access to private early adopters channel on NISAR Applications Slack Workspace
- Join moderated EAs-Only discussions via Slack
- Join quarterly EA telecons where you can present your work, receive feedback, and discover opportunities for collaboration

This work was performed at the Jet Propulsion Laboratory, California Institute of Technology, under contract with the National Aeronautics and Space Administration.

Questions?

NEXT STEPS

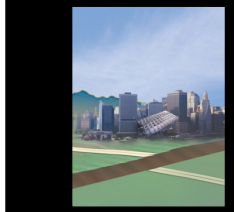
NISAR Applied Science & Applications Community Engagement

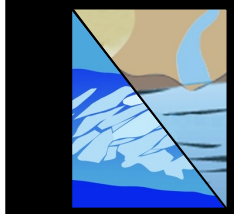
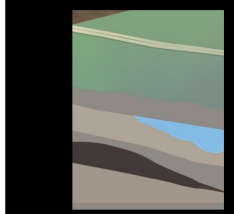


NISAR SCIENCE COMMUNITY WORKSHOP
AUG. 30– SEPT. 1, 2022
PASADENA, CA

Jet Propulsion Laboratory
California Institute of Technology

NISAR Applications Community Engagement


Community Engagement

1. **NISAR Applications Workshops (2014 – present, focused area since 2017)**
2. Training & Education
3. Community of Practice and Early Adopters' Program
4. User Community Envoys

Focus-Area Applications Workshops to Date

- *Oceans: Sea Ice*
- *Critical Infrastructure*
- *Forest and Disturbance*
- *Agriculture and Ecosystems*
- *Wetlands*
- *SAR Literacy*
- *Geohazards: Landslides*
- *Geohazards: Volcanos*
- *Geohazards: Earthquakes & Induced Seismicity*
- *Subsidence & Resource Extraction*

Future:

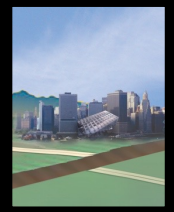
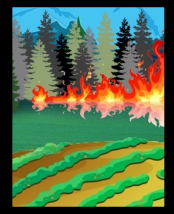
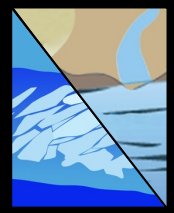
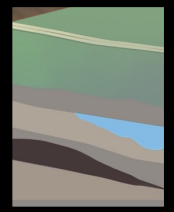
- *Flood / Extreme Weather (FY 23)*
- *Environmental Justice (FY 23)*
- *Early Adopter (FY 24)*
- *Disaster Response (~launch)*
- *Data Product Tutorials (TBD)*

Community Priorities

Agriculture & Soil Moisture	***Soil moisture***	Crop classification	**Surface water extent**	Crop yield
Forests & Disturbance	Biomass	Disturbance detection	***Soil moisture***	Disturbance classification
Wetlands	**Surface water extent**	***Soil moisture***	Vegetated wetland extent	**Water level vs. time**

Critical Infrastructure	**Displacement time series**	**Flood map**	**Damage map**
Landslide	**Displacement time series**	***Soil moisture***	**Damage map**
Earthquake & Induced Seismicity	**Displacement time series**	Coseismic displacement map	**Damage map**
Volcano	The community is very experienced in using SAR. Their top priority is getting data quickly.		
	Low latency L0 products	**Displacement time series**	Backscatter & change maps

Sea Ice	Sar-savvy community; want specific polarizations for sea ice; want Arctic coverage		
	Operational (6-48 hr latency): **Low latency L0 products**		Sea ice concentration, extent, type
	Science	Sea ice concentration, classification	


L3/L4 Products in Development

Level 0 | Level 1 | Level 2 | Level 3-4 (Validation Only)

Level 0, Level 1, Level 2, Level 3-4 Validation, Browse Products, and Catalog delivered to DAAC

Radar Reformatted Raw Data

Time Varying Parameter Files

Calibrated Single Look Complex Images in Radar Coordinates

(multiple modes)

Ancillary Data (Meteo, DEM, etc.)

SLC & Multi-looked & Geocoded polarimetric images

Multi-looked & Geocoded Interferograms and Images

Woody biomass for regions < 100 t/ha — VP

Vegetation disturbance product — VP

Wetlands inundation area — VP

Crop area — VP

Vegetation structure*

Ground deformation/rates — VP

Change proxy — VP

Ice sheet/glacier velocity and velocity change — VP

Sea ice velocity — VP

*experimental

Products
- Instrument
- Ecosystems
- Solid Earth def.
- Dynamics of ice
- Hydrology

VP = Validation Product

NISAR's DAAC: Alaska Satellite Facility

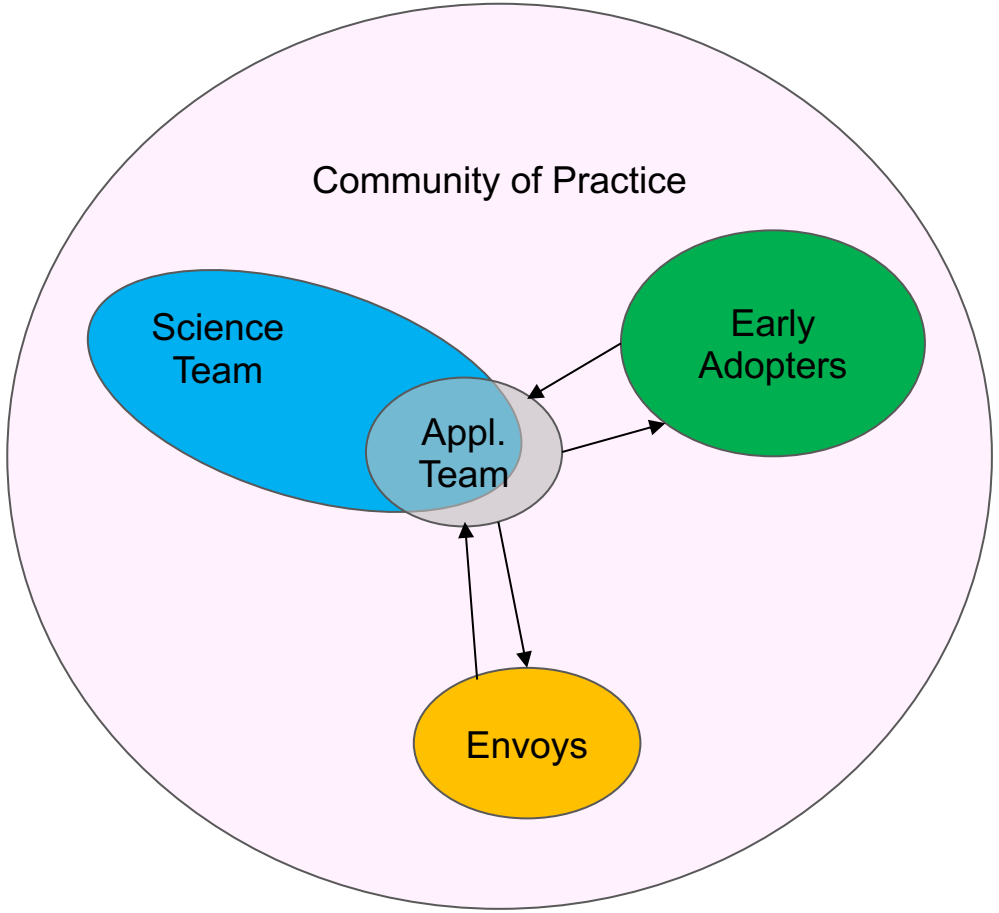
Level 3-4 NISAR Project

- Global Soil Moisture -200 m product
- Sahara Soil Moisture -400 m product

Level 3-4 OPERA Project

- Global surface water extent product
- Global disturbance product
- North America deformation product

NISAR Applications Community



Community of Practice: Anyone interested in following the mission progress and working with NISAR products.

Envoys: People selected to help shape the strategic use of NISAR within their community.

Early Adopters: Individuals who demonstrate strong interest in using NISAR products early and propose projects to prepare for its use before launch.

Early Adopters & Community of Practice

Community of Practice

are individuals or organizations that can be public or private, Federal or local entities, and can have a local, national or international scope for their application.

Early Adopters (Science or Applications)

are individuals, teams, and organizations who

- have a clearly defined need for NISAR data
- have an existing application that can benefit from NISAR and
- are capable of applying their own resources to demonstrate the utility of NISAR data for their application.

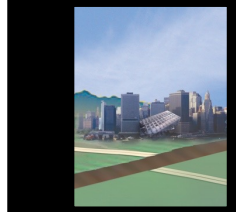
Early Adopters provide important feedback to the NISAR team regarding which NISAR data products meet the needs of their applications.

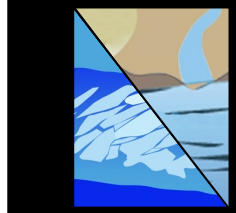
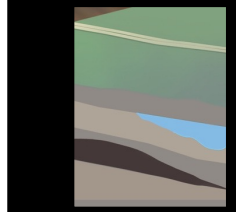
Become and Early Adopter

to learn about the NISAR mission and its data, and to join quarterly telecons to present your work, receive feedback and discover opportunities for collaboration!

Apply Here!

https://nisar.jpl.nasa.gov/engagement/application-sign-up


Early Adopters Program

- Leverage NISAR-like data from UAVSAR and Sentinel-1, with Jupyter notebooks, tutorials, training materials.

- Maintain a Slack channel
  - Instrument Status, FAQs, moderated Slack discussions
  - Facilitate communication on common questions, data needs, possible collaboration, and other topics.

- Hold Quarterly Telecons
  - Provide an update on mission status, available datasets, etc.
  - Feature different EAs, who have the chance to present their work to other EAs

- EA-populated outward-facing Blog/Tweet

- Website and Newsletters
  - Announce UNAVCO and other training workshops and courses
  - Links to educational resources, tutorials

Early Adopter: NISAR-like Data from UAVSAR

https://uavsar.jpl.nasa.gov/cgi-bin/data.pl

Jet Propulsion Laboratory
California Institute of Technology

UAVSAR Data Search

A GeoJSON file with all flown lines is available here.

[Hide]

Date range: Tue, 1 Jan 2008 to Tue, 17 May 2022

Processing modes: PolSAR, InSAR Pair, InSAR Browse, SLC Stack, TomoSAR, TopSAR (Ka-band)

Band: L-band, P-band, Ka-band

Specialized Products: Simulated NISAR

Search

Lat: Lng: Show

Zoom in to click on a flight line

Map

440 products from 73 flight lines found [Hide]

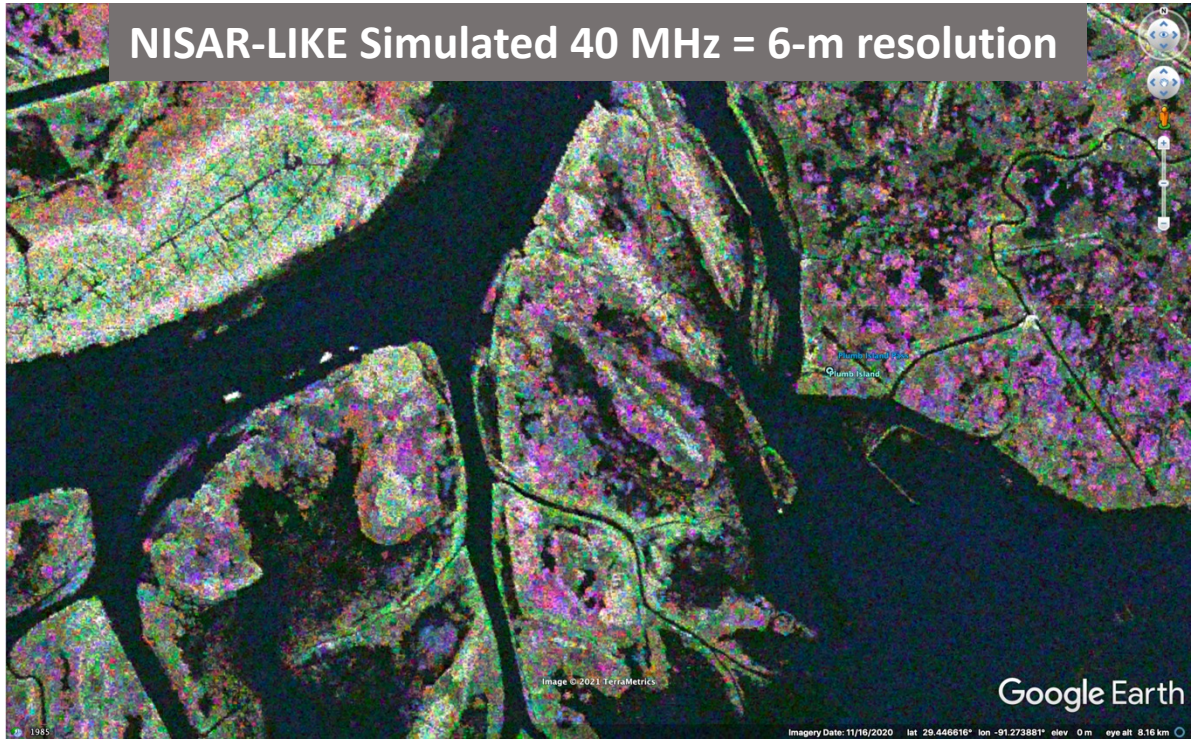
- beaufo_01104 (1) - Beaufort Sea, AK
- beaufo_19103 (1) - Beaufort Sea, AK
- BigIsl_32905 (1) - Big Island, HI
- bonanW_03603 (6) - Bonanza Creek LTER
- brazos_14938 (3) - Brazos River, TX
- dhorse_18519 (4) - Deadhorse Legacy Line
- eighty_13055 (1) - Rabi Forest, Gabon
- eighty_14047 (1) - Lope National Park, Gabon
- evergl_15704 (1) - Everglades, FL
- FLcoas_00103 (1) - Central West Coast, FL
- fortym_14045 (1) - Lope National Park, Gabon
- grmesa_09305 (1) - Grand Mesa, CO
- Grnlnd_00004 (2) - Glaciers, Greenland
- Grnlnd_00005 (3) - Glaciers, Greenland
- gulfco_14013 (2) - Gulf Coast, LA
- gulfco_27086 (1) - Gulf Coast, LA
- gulfco_27802 (9) - Mike Island
- gulfco_27803 (8) - white lake
- Haywrd_14501 (19) - Hayward Fault, CA
- height_13059 (1) - Rabi Forest, Gabon
- hsixty_13058 (1) - Rabi Forest, Gabon
- htwent_13057 (1) - Rabi Forest, Gabon
- htwent_14049 (1) - Lope National Park, Gabon
- hundre_13056 (1) - Rabi Forest, Gabon
- hundre_14048 (1) - Lope National Park, Gabon
- kakisA_11703 (4) - Kakisa Lake, Canada
- lopenp_14043 (2) - Lope National Park, Gabon
- NISARA_00914 (8) - Arkansas 1
- NISARA_02602 (12) - Yucatan Lake, LA
- NISARA_06800 (7) - Forest management and Arkansas agriculture
- NISARA_13904 (5) - ORNL, TN
- NISARA_13905 (6) - Coweeta, NC
- NISARA_22802 (12) - Tifton, GA

Last updated: October 26, 2021 Contact Webmaster | Privacy | Image Policy (CL 07-1343)

Full Resolution UAVSAR

3-m resolution

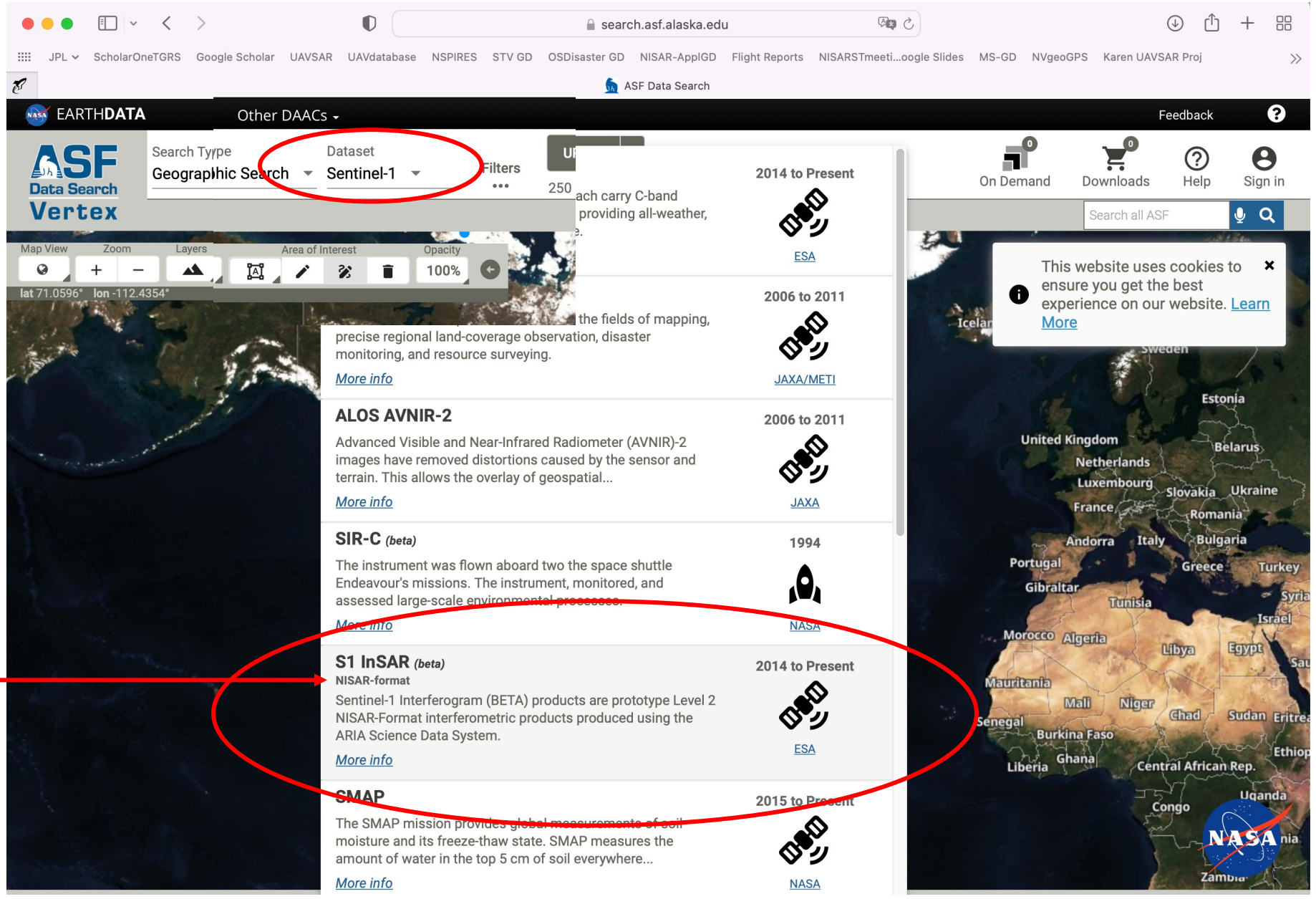
NISAR-LIKE Simulated 40 MHz = 6-m resolution



Early Adopter: NISAR-format Sentinel / InSAR

Alaska Satellite Facility DAAC VERTEX

NISAR FORMAT



Resources: Application White Papers

National Aeronautics and Space Administration

NISAR: The NASA-ISRO SAR Mission

Earthquake! Tracking Location and Impact from Space

Earthquakes occur suddenly, often with intense ground shaking that causes loss of life and property. They and their aftershocks can induce landslides, lead to fires, and even bring neighboring faults closer to rupture. NISAR will provide measurements of ground deformation along faults before an earthquake occurs, from the earthquake itself, and in the time following, all key information for understanding where and why earthquakes occur.

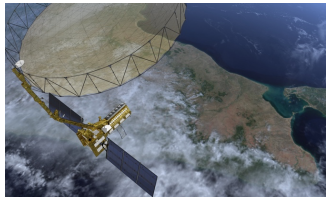
Earthquake Hazards in the United States and Around the World

Earthquakes in the United States are estimated to cost about $5.3B annually (FEMA, 2008). Earthquakes can damage buildings and critical infrastructure, rupture gas and water lines, cause landslides, and create liquefaction. Sedimentary basins can amplify earthquake shaking, even for distant earthquakes: The 1985 Mexico City earthquake occurred 350 km from the city, but because the city is located on an ancient lakebed, it experienced intense shaking, killing thousands of people. Subduction zone earthquakes that originate offshore can create tsunamis, resulting in further damage and loss of life: The 2011 M9.0 Tōhoku-oki earthquake offshore of Japan created tsunami waves reaching as much as 130' high. Landslides and fires are additional hazards that cascade from earthquakes: Fires broke out after the 1906 M7.9 San Francisco earthquake destroying much of the city.

Photos: USGS

Plate Tectonics and Earthquakes

Movement of Earth's tectonic plates causes strain to accumulate in the crust, which eventually drives fault to rupture. Following major earthquakes, the ground continues to deform and aftershocks occur as the crust responds to the changes in stress. Surface motion in the area around an earthquake fault are measurable throughout this entire earthquake cycle of loading, rupture, and recovery.



The NISAR Mission – Reliable, Consistent Observations

The NASA–ISRO Synthetic Aperture Radar (NISAR) mission, a collaboration between the National Aeronautics and Space Administration (NASA) and the Indian Space Research Organization (ISRO), will provide all-weather, day/night imaging of nearly the entire land and ice masses of the Earth repeated 4-6 times per month. NISAR's orbiting radars will image at resolutions of 5-10 meters to identify and track subtle movement of the Earth's land and its sea ice, and even provide information about what is happening below the surface. Its repeated set of high-resolution images can inform resource management and be used to detect small-scale changes before they are visible to the eye. Products are expected to be available 1-2 days after observation, and within hours in response to disasters, providing actionable, timely data for many applications.

National Aeronautics and Space Administration

Cont. from front page

Earthquakes can occur in many parts of the world, but nearly 90% happen along the Ring of Fire, the area around the rim of the Pacific Ocean where most active volcanos lie. The Ring of Fire includes Japan and California, both parts of the world where earthquakes are frequent occurrences.

When an earthquake fault ruptures, seismic waves radiate away from the fault causing ground shaking along their path. It is common for this seismic shaking to trigger landslides and to indirectly induce fires. Understanding the likely scale and location of future large earthquakes is therefore an important ingredient in preparing for them and reducing the loss of life and property.

Faults generally slip continuously deep within the Earth, but near the surface the faults can be 'locked' or 'clamped,' and do not move continuously. These shallower locked portions are the source of the earthquakes we feel. The deep fault slip manifests at the surface as small shifts in the ground, or deformation, that is localized around the faults. Detection of areas with higher rates of deformation can be used to identify active faults. The rate of slip across the fault, depth at which the fault becomes locked, and the length of the rupture all contribute to the magnitude of an earthquake, with larger slip and longer ruptures resulting in more powerful earthquakes. Therefore, determining long-term slip rates on faults and other characteristics is key to forecasting earthquake hazard.

Earthquakes are usually the result of tectonic processes; however, they can also be induced by human activity. Such 'induced' seismicity can be the result of geothermal operations, hydraulic fracturing to extract oil and gas, injection of wastewater, and large changes in the stored water at water reservoirs, particularly from water in dams.

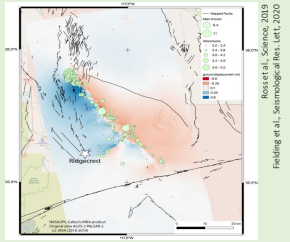
The larger induced earthquakes are typically associated with injection of wastewater used to aid the extraction of oil and gas from underground reservoirs. The injection of water increases pore pressure in the rock and can interact with an existing fault, triggering an earthquake. The injection of fluids can cause measurable uplift or subsidence of the ground surface.

Deformation measured with NISAR will help in mapping fault zones and fault systems around the world and detecting subsidence and uplift associated with human activity. This information is obtained before an earthquake happens and provides insight into how they will behave. Following earthquakes, NISAR will identify earthquake ruptures and measure the amount that the ground slipped along the faults, mapping the length of the rupture and providing an indication of damage extent. NISAR will be used to locate areas of damage to roads, buildings, and other structures, and provide information about other disasters triggered by the earthquake

Earthquake fault motion and damage

In 2019 two earthquakes occurred near the town of Ridgecrest and the China Lake Navy facility in southern California. A M6.4 earthquake on July 4, 2019 was followed by a M7.1 earthquake on July 5, 2019 about 34 hours later. The two faults ruptured nearly perpendicular to each other. Radar can be used to measure permanent ground displacements associated with earthquakes as well as continued motions as faults continue to slip aseismically after large earthquakes. Surface disruption can also be measured with radar providing a proxy of where specifically damage occurs to buildings.

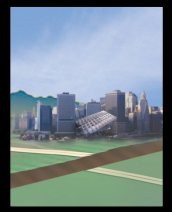
The image at right shows the ground displacements from the 2019 Ridgecrest earthquake sequence. Motions can be detected in an area about 60 km long and 40 km wide.

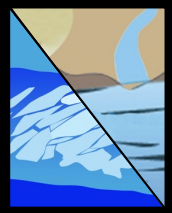
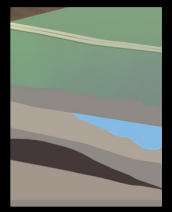


Radar-derived map of ground movement near Ridgecrest, California, following magnitude 6.4 and 7.1 earthquakes in July 2019. Areas west of the main fault rupture (blue) moved northwest while areas east of the fault (red) moved southeast. Black lines show mapped faults.

For more information, visit http://nisar.jpl.nasa.gov/applications

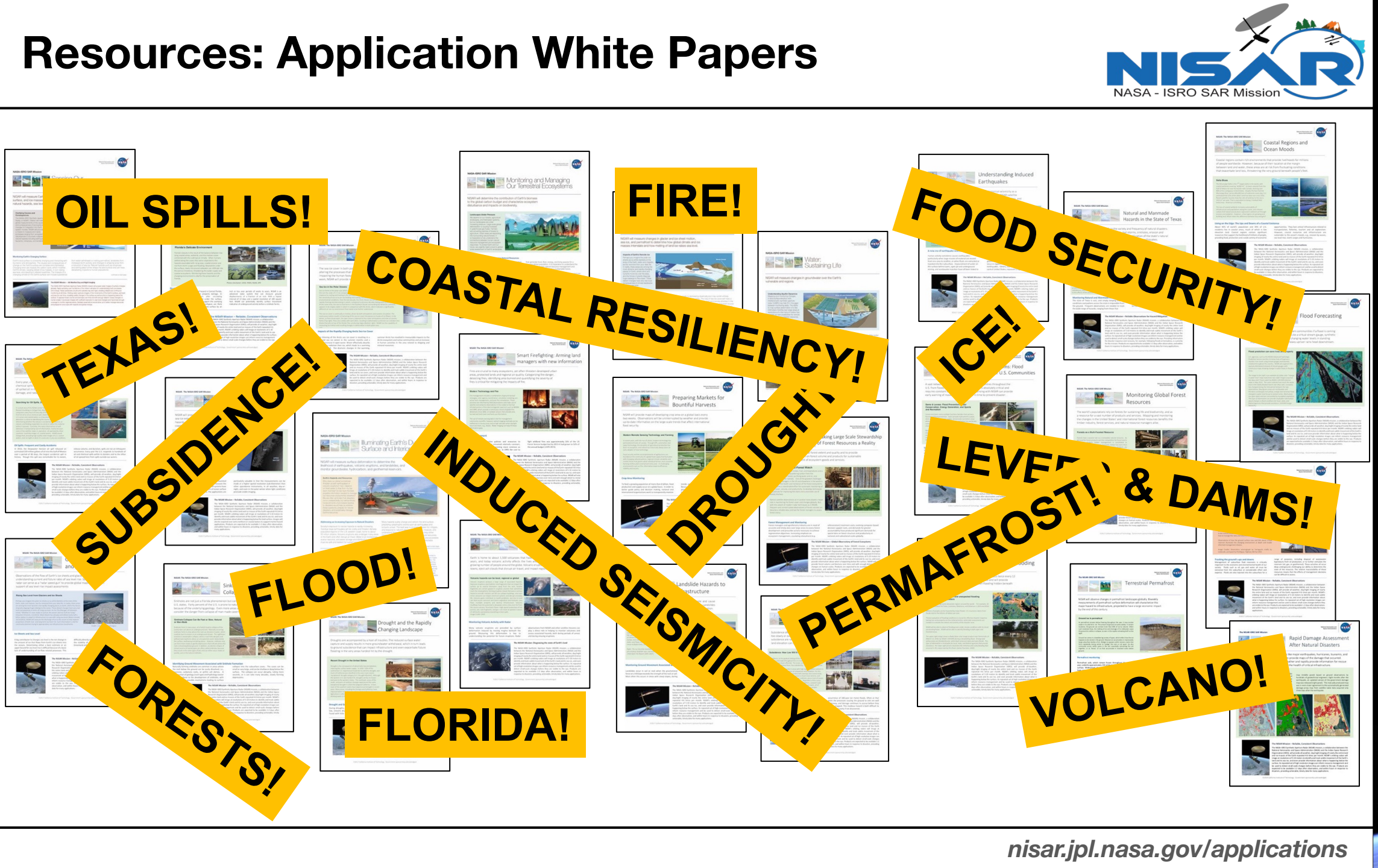
Jet Propulsion Laboratory / California Institute of Technology / Pasadena, California **/ www.jpl.nasa.gov**

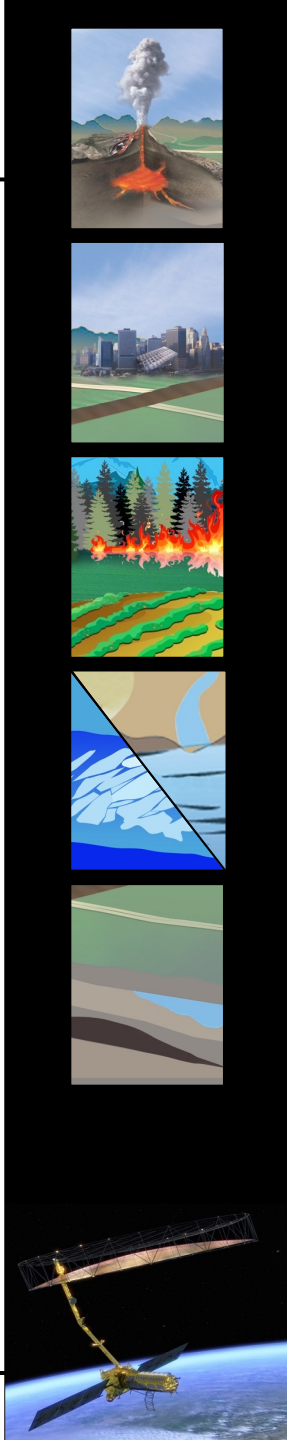




Resources: Application White Papers

NISAR
NASA - ISRO SAR Mission

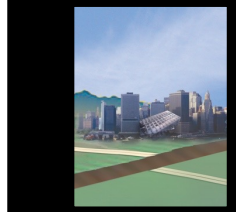


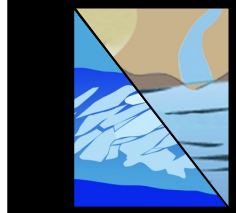
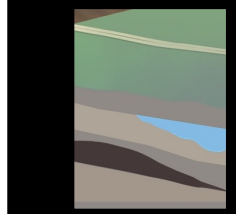


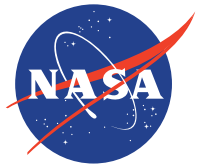
nisar.jpl.nasa.gov/applications

Summary

- NISAR mission actively engages the applications community so that they are aware of the instrument's capabilities and ready to use the data when it becomes available.
- Applications of NISAR go far beyond disaster response
  - Community feedback consistently shows that long term monitoring with time series of surface conditions is viewed by most as the highest value contribution.
  - Reduced latency in L0 product delivery is needed for emergency response and by the sea ice/ocean winds community & the volcano observatories.
- Early Adopters can prepare for using the NISAR products and contribute to NISAR cal/val.
- NISAR-simulated products from the airborne UAVSAR L-band SAR are available for everyone, and we encourage NISAR Early Adopters to use it.

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