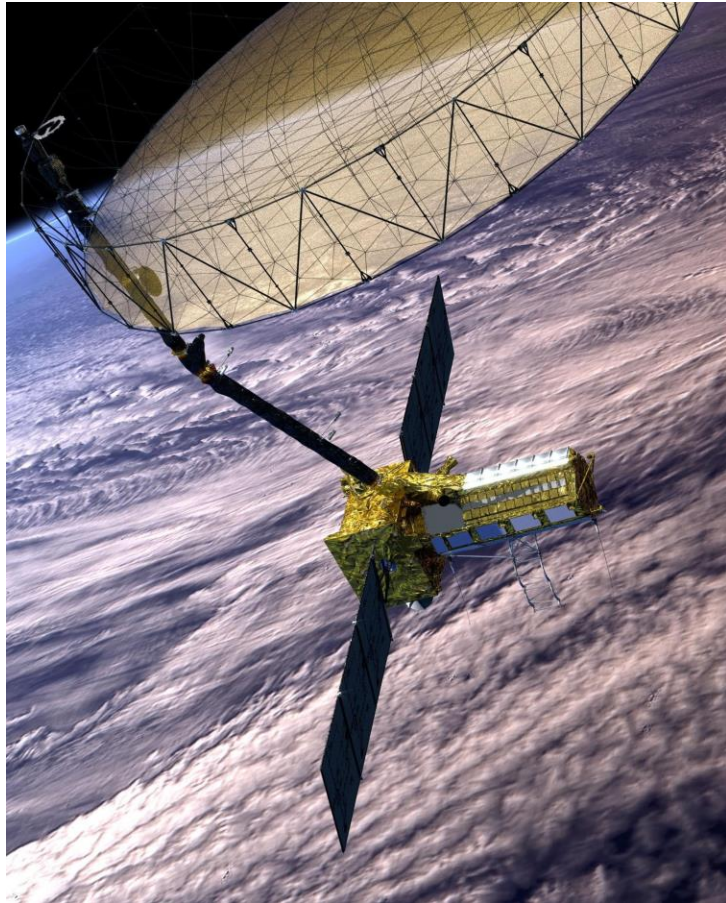




Jet Propulsion Laboratory  
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# NISAR Urgent Response Products for Natural Hazards and Disasters

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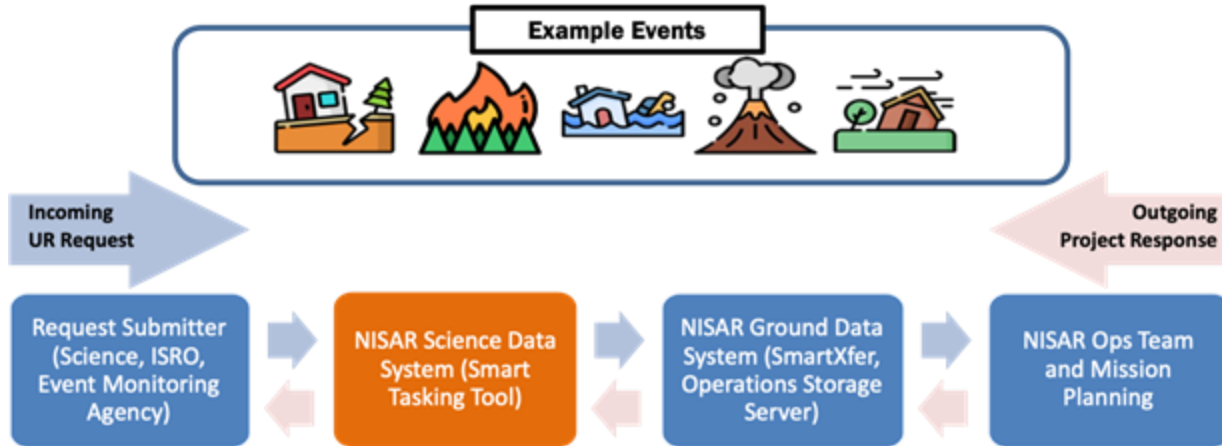


# NISAR (NASA-ISRO SAR)

| NISAR Characteristic:                          | Enables:                                                   |
|------------------------------------------------|------------------------------------------------------------|
| L-band (24 cm wavelength)                      | Low temporal decorrelation and foliage penetration         |
| S-band (9.4 cm wavelength)                     | Sensitivity to light vegetation                            |
| SweepSAR technique with Imaging Swath > 240 km | Global data collection                                     |
| Polarimetry (Single/Dual/Quad)                 | Surface characterization and biomass estimation            |
| 12-day exact repeat                            | Rapid Sampling                                             |
| 3 – 10 meters mode-dependent SAR resolution    | Small-scale observations                                   |
| 3 yrs (NASA) / 5 yrs (ISRO) science operations | Time-series analysis                                       |
| Pointing control < 273 arcseconds              | Deformation interferometry                                 |
| Orbit control < 500 meters                     | Deformation interferometry                                 |
| > 10% (S) / 50% (L) observation duty cycle     | Complete land/ice coverage                                 |
| Left-only pointing (Left/Right capability)     | Uninterrupted time-series<br>Rely on Sentinel-1 for Arctic |

# NISAR Urgent Response

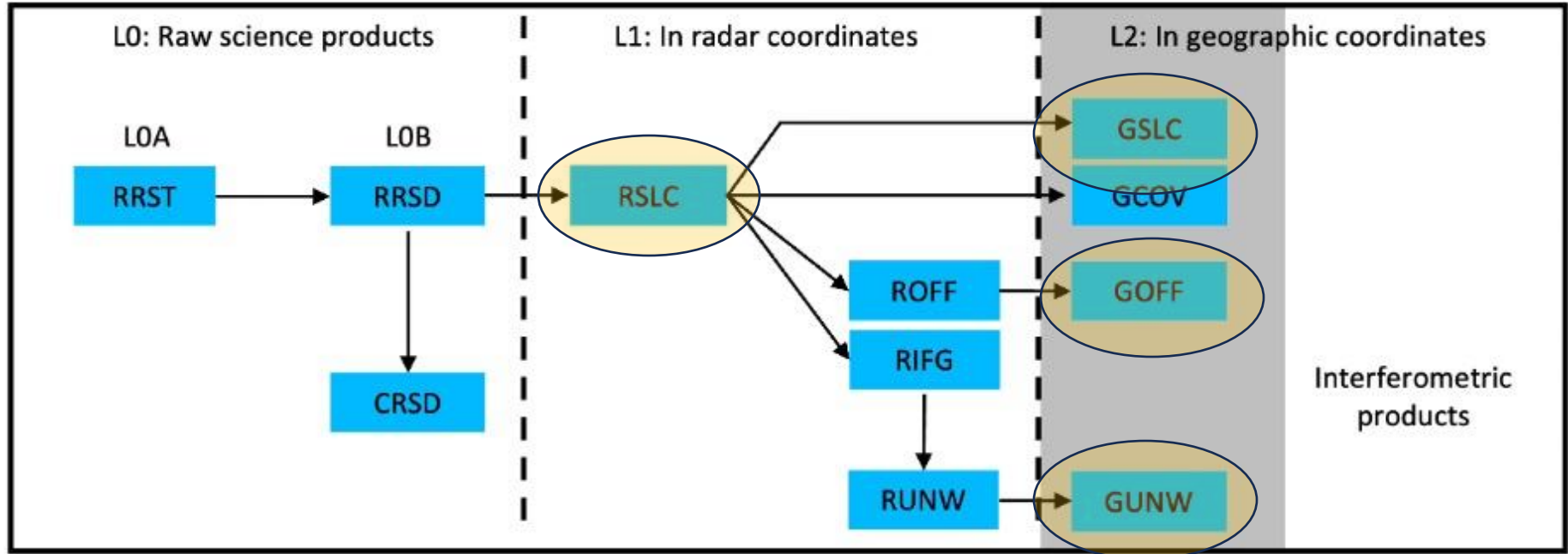
- NISAR has Urgent Response built into the system
- Urgent Response Requests are managed by the Smart Tasking Tool (SMT)
- Automated UR request submissions from a US Agency (USGS VNS, USGS NEIC, USGS ENS)
  - The Science Team Urgent Response Working Group defined the thresholds
- Manual submissions through SMT Web interface, with approved account access



# Guidelines for Implementing Urgent Response

- The baseline Reference Observation Plan (ROP) is of highest priority
  - No changes will be implemented that would redirect NISAR away from baseline plan
  - Mission System may reject Urgent Response (UR) requests that potentially destabilize the baseline mission
- No change in instrument mode from baseline plan
  - Assumption is that the selected modes in the ROP are the best modes for the planned observations, including Urgent Response requests. Modes for new observations are agreed upon at time of ROP generation
- Expedited Processing
  - Since NISAR collects data over land and sea ice all the time, the UR request is most likely over an area that's already in the plan; in that case, the system will expedite the production of the science data products
- Update observation plan with a 24 hour turn around time
  - In the rare case where the area for the Urgent Request is not already in the plan, Mission System has demonstrated the capability that the plan can be updated with a 24 hour turn around time. This type of special requests will require Project direction.
- UR implementation should not result in re-scheduling of ground stations
  - Ground stations are a shared resource, with finalized schedules 1 week prior to execution.
- Project is targeting to accept manual UR requests soon

# NISAR L0 to L2 science data products flow



See NISAR Science Handbook for product details, 2nd Edition (2025)

Or

NASA SDS Product Description Document, JPL D-95672, Fattahi et al. (March 14, 2025)

# Fidelity and Latency of Urgent Response Products

- JPL Science Data System (SDS) **expedites** the processing of the UR data
- The UR products are **lower fidelity** products. The filenames and the metadata will clearly state that these are UR products.
- **Mean latency** of UR L0's is 2 hours; for UR L1's is 4 hours, and for UR L2's is 6 hours
  - Latency is the time between telemetry arrival at SDS and product generation.
- Any data processed for Urgent Response will also be processed to make regular products => the most precise data will be available within 3 days.

|                                                                        | Nominal Products                                                     | Urgent Response Products                    |
|------------------------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------|
| <b>Orbit Ephemeris</b>                                                 | Near-Realtime Orbit Ephemeris (NOE) and Medium Orbit Ephemeris (MOE) | Forecast Orbit Ephemeris (FOE)              |
| <b>Radar Pointing</b>                                                  | Near-Realtime Radar Pointing (NRP) and Precise Radar Pointing (PRP)  | Forecast Radar Pointing (FRP)               |
| <b>Geolocation correction using Ionospheric Total Electron Content</b> | Yes                                                                  | No                                          |
| <b>Tropospheric Correction</b>                                         | Yes                                                                  | No                                          |
| <b>Availability</b>                                                    | Available to the public<br>Via the ASF DAAC                          | Available to the public<br>Via the ASF DAAC |

Expedited processing of UR data

# Automated UR Requests

- **SMT processes the feed and creates a UR request when the project-defined thresholds are triggered.**
  - Thresholds were updated per recommendation in Urgent Response Team Working Group Reports
  - Updates to the thresholds will be coordinated with the NISAR Applications Team and NASA Disasters Program Manager
- **Two Automated Feeds are available from USGS**
  - Volcano Events
  - Earthquakes

# Automated UR requests for Earthquake Events

- SMT has an automated feed to receive alerts from the United States Geological Survey (USGS)
- Spatial Extent: Global
- Trigger UR submission if any of the following logic is True:
  1. USGS PAGER level is Red or Orange
  2. PAGER level is Yellow and in US or India
  3. Earthquake in US or India that is  $\geq 7.0$  magnitude and  $< 50$  km in depth
- Definition of “in US” or in “India”
  - The GeoJSON created by the earthquake’s epicenter with a 240 km radius intersects the GeoJSON representing the US or India

\* PAGER = Prompt Assessment of Global Earthquakes for Response

| Alert Level and Color | Estimated Fatalities | Estimated Losses (USD)      |
|-----------------------|----------------------|-----------------------------|
| Red                   | 1,000+               | \$1 billion+                |
| Orange                | 100 - 999            | \$100 million - \$1 billion |
| Yellow                | 1 - 99               | \$1 million - \$100 million |
| Green                 | 0                    | < \$1 million               |



# Automated UR requests for Volcano Events

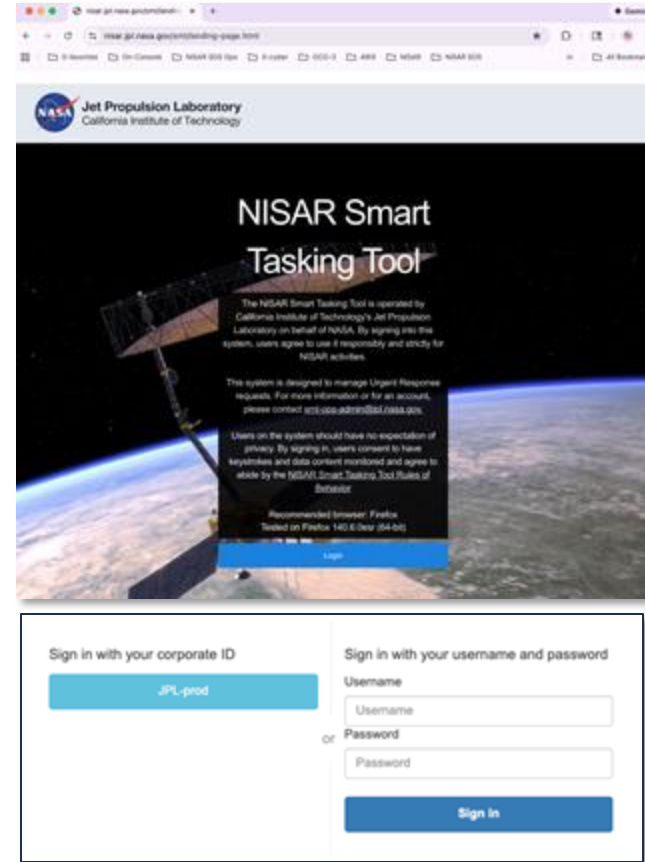
- SMT has an automated feed to receive alerts from the Volcano Notification Service (VNS)
- Spatial Extent: U.S.
- Notices are issued by these Volcano Observatories:
  - Alaska (AV) (and Commonwealth of Northern Marianas Islands)
  - California (CalVO)
  - Cascades (CVO)
  - Hawaiian (HV) (and American Samoa)
  - Yellowstone (YV)

- Threshold is based on the USGS VNS Aviation Code
- Trigger UR submission if color is Red or Orange

| AVIATION COLOR CODES                                                                                   |                                                                                                                                                                                                                                                             |
|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When the volcano color code changes, a Volcano Observatory Notification for Aviation (VONA) is issued. |                                                                                                                                                                                                                                                             |
| <b>GREEN</b>                                                                                           | Volcano is in typical background, non-eruptive state<br>or, after a change from a higher level,<br>volcanic activity has ceased and volcano has returned to noneruptive background state.                                                                   |
| <b>YELLOW</b>                                                                                          | Volcano is exhibiting signs of elevated unrest above known background level<br>or, after a change from a higher level,<br>volcanic activity has decreased significantly but continues to be closely monitored for possible renewed increase.                |
| <b>ORANGE</b>                                                                                          | Volcano is exhibiting heightened or escalating unrest with increased potential of eruption, timeframe uncertain,<br><b>OR</b><br>eruption is underway with no or minor volcanic-ash emissions [ash-plume height specified, if possible].                    |
| <b>RED</b>                                                                                             | Eruption is imminent with significant <b>emission</b> of volcanic ash into the atmosphere likely<br><b>OR</b><br>eruption is underway or suspected with significant emission of volcanic ash into the atmosphere [ash-plume height specified, if possible]. |

# Manual UR Requests

- There are currently 33 people from NASA+NOAA+USGS with login access to place urgent response requests
- NISAR mission systems will track the number of requests & remove/modify requesters to stay within mission resources.



Jet Propulsion Laboratory  
California Institute of Technology

## NISAR Smart Tasking Tool

The NISAR Smart Tasking Tool is operated by California Institute of Technology's Jet Propulsion Laboratory on behalf of NASA. By signing into this system, users agree to use it responsibly and study for NISAR activities.

This system is designed to manage Urgent Response requests. For more information or for an account, please contact [nasa.admin@jpl.nasa.gov](mailto:nasa.admin@jpl.nasa.gov).

Users on the system should have no expectation of privacy. By signing in, users consent to have keystrokes and data content monitored and agree to abide by the NISAR Smart Tasking Tool Rules of Behavior.

Recommended browser: Firefox  
Tested on Firefox 140.0.0 (64-bit)

Login

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Sign in with your corporate ID

JPL-prod

or

Sign in with your username and password

Username

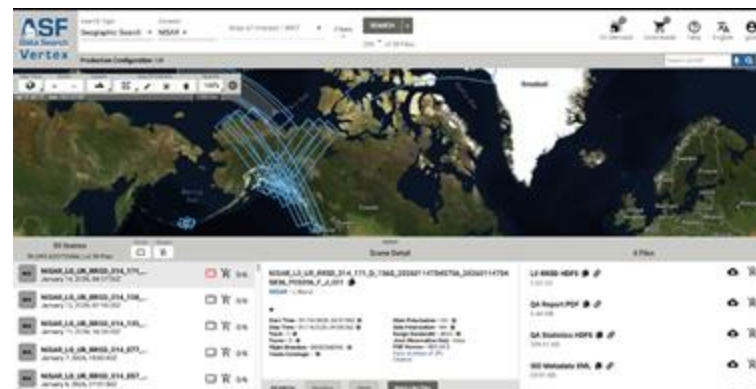
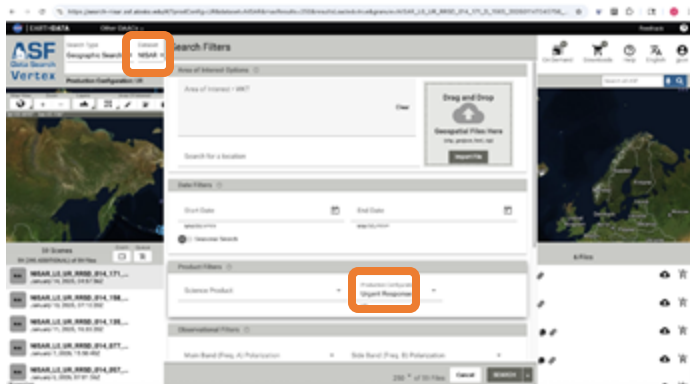
Password

Sign in

# Accessing UR Products from the DAAC

- Currently **requires users to be on NISAR pre-launch access list** until data is publicly released, planned in July 2026
- When data is public, users should be able go to normal ASF Vertex site (<https://search.asf.alaska.edu/>)
- Set Dataset to **NISAR** and filter for **Urgent Response**
- Products are accessible at the DAAC and NASA EarthData via:
  1. Programmatic API's: ASF\_SEARCH library OR Earthaccess library
  2. Webportals: Earthdata OR ASF Vertex

## Vertex



# Data Access

## Data Access via ASF DAAC

- UR products will be delivered to the Alaska Satellite Facility Distributed Active Archive Center (ASF DAAC) into a different location than nominal products.
- Retention is 30 days.

## File Naming Convention

- UR products are tagged as **UR**, and nominal products are tagged as **PR** (for production).
- **J** indicates that these products are generated by JPL

NISAR\_L1\_UR\_RSLC\_001\_005\_A\_219\_4020\_SVNA\_A\_20220104T182346\_20220104T183426\_P01101\_M\_F\_J\_001.h5

NISAR\_L1\_PR\_RSLC\_001\_005\_A\_219\_4020\_SVNA\_A\_20220104T182346\_20220104T183426\_P01101\_M\_F\_J\_001.h5

UR Products will be available to the public via the ASF DAAC

$M_w$  7.8  
Philippines  
earthquake  
2026/06/07  
(not UR)

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