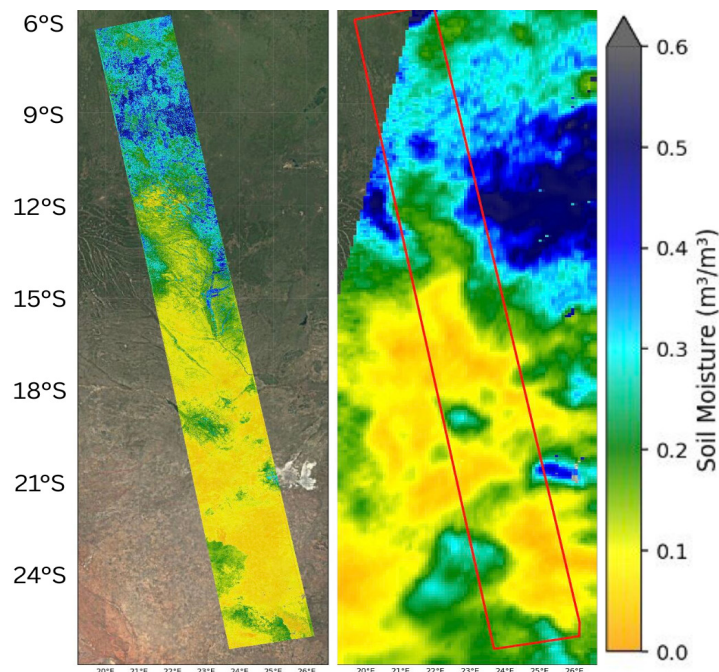


Global NISAR Soil Moisture Product

Satellite Needs Working Group - Solution Fact Sheet

The NASA/Indian Space Research Organization (ISRO) Synthetic Aperture Radar (NISAR) mission is the first satellite mission to collect dual-frequency SAR (L-band and S-band) capturing highly detailed measurements of changes in Earth's surface and complex processes and conditions such as soil moisture. The Satellite Needs Working Group (SNWG) enabled the production of well-calibrated and -validated soil moisture products with 200 meter resolution globally (400 m for the Sahara Desert). These soil moisture products, developed by NASA's SNWG Implementation TEam (NSITE), are provided at a minimum of two observations every 12 days, with more frequent observations at higher latitudes as the orbits converge closer to the poles. The fine-scale resolution of these products make it possible to assess farm field-scale changes in soil moisture and monitor surface water availability for applications such as agriculture, forestry, fire hazard, and water resource management.



A comparison of NISAR soil moisture at 200 m (left) over Africa on November 11, 2025, and SMAP soil moisture at 9 km (right), highlighting the difference in resolution.

Credit: NASA GSFC

Scientific & Societal Benefit

- Provides vital measurements of soil moisture needed by the agricultural industry for crop yield estimation, crop hazard alerts, food demand forecasts, and improved efficiency of irrigation, water use, and fertilization
- Assists in predicting flood potential through finer-spatial resolution mapping of small watersheds not adequately captured by existing soil moisture maps
- Aids in monitoring vector-borne disease activity by providing soil wetness data to estimate the extent of stagnant water that encourages disease
- Contributes to landslide hazard identification by detailed mapping of soil wetness on sloped terrain
- Supports fire hazard prediction and drought monitoring through identification of prolonged periods of dry conditions

NASA's SNWG Implementation TEam (NSITE)

Global NISAR Soil Moisture Product

Data Characteristics	
Platform	NASA-ISRO Synthetic Aperture Radar (NISAR)
Instrument	24 cm wavelength L-band Synthetic Aperture Radar (L-SAR)
Processing Level	3 (variables mapped on uniform space-time grid scales, with some completeness and consistency)
Temporal Coverage	Based on NISAR availability
Temporal Frequency	6 - 12 days
Latency	72 hours
Spatial Coverage	Near-global (outside of regions with permanent ice)
Spatial Resolution	200 m (400 m for the Sahara Desert)
Data Format	HDF5

How do I access this data?

The NISAR Soil Moisture product is not yet available. Sample NISAR data products are available and can be downloaded through NASA's ESDIS archive, where the official products will later be distributed.



NASA'S ESDIS
Archive



Sample NISAR
Products

Where can I find more information?

More information on the NISAR Soil Moisture Product is available on this solution's webpage and the official NISAR website.



NISAR Soil Moisture
Webpage



NISAR Project
Website

Background Image Credit: USDA

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