

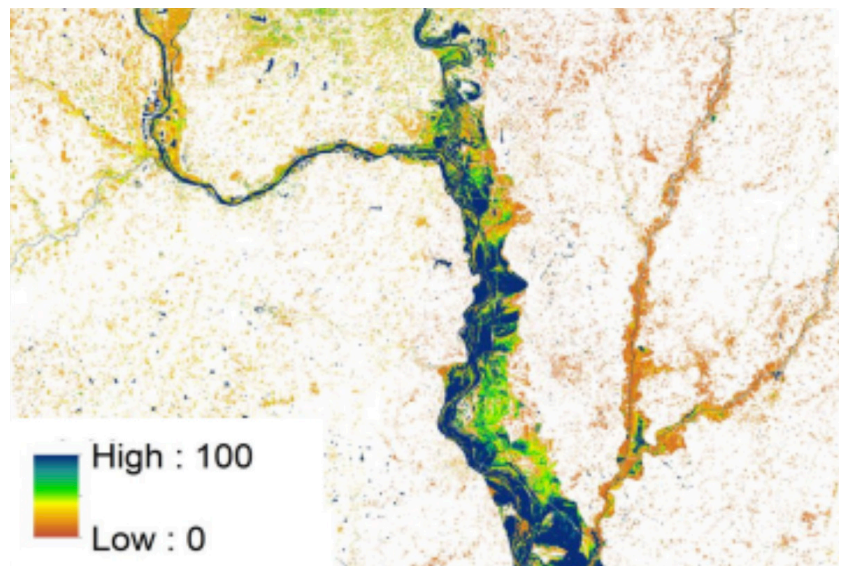
OPERA Dynamic Surface Water Extent Product Suite

Satellite Needs Working Group - Product Fact Sheet

The Observational Products for End-Users from Remote Sensing Analysis (OPERA) project, managed by NASA's Jet Propulsion Laboratory, is developing a suite of near-global Dynamic Surface Water eXtent (DSWx) products from optical and synthetic aperture radar (SAR) imagery. The suite consists of three products that utilize the temporal frequency of the Harmonized Landsat Sentinel-2 (HLS: DSWx-HLS) optical imagery, with the cloud penetrating capability of Sentinel-1 (DSWx-S1) and NASA-ISRO Synthetic Aperture Radar (NISAR: DSWx-NI) data. DSWx is analysis-ready across the product suite.

DSWx-HLS observations of water inundation near Omaha, Nebraska revealed how flooding impacted agricultural regions in 2019. Inundation frequency ranges from red (infrequent) to blue (persistent) and yields insights into how to better prepare for future floods.

Credit: NASA Jet Propulsion Laboratory



Data Benefits

- Provide near-global data of surface water extent for all land masses except Antarctica at 30-m resolution
- Measure surface water multiple times per week, depending on cloud conditions
- Blend the benefits of both optical and SAR imagery to produce surface water observations through clouds and vegetation, and in areas of complex terrain
- Improve water resource management, disaster response, and understanding of hydrologic processes through surface water observations

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Opera DSWx Product	DSWx-HLS	DSWx-S1	DSWx-NI
Platform	Harmonized Landsat 8 / Sentinel-2A/B (HLS)	Sentinel-1A (S1)	NASA-ISRO Synthetic Aperture Radar (NISAR)
Sensor Type	Optical	Radar	
Processing Level	3		
Temporal Coverage	April 2023 - present	July 2024 -	May 2025 -
Temporal Frequency	~ 3 days	12 days; 6 days in certain areas; higher with S-1C	~ 6 days
Spatial Coverage	Near-global (all land masses except Antarctica)		
Spatial Resolution	30 m		
Data Format	Cloud-Optimized GeoTIFF		

How do I access this data?

OPERA DSWx products are distributed by NASA's PO.DAAC, including data access, documentation, and usage examples.



PO.DAAC

Where can I find more information?

NASA SNWG and community-contributed materials are available on the Stakeholder Engagement Program (SEP) webpage. The OPERA website provides further information on DSWx and other OPERA products.



SEP Webpage



OPERA Webpage

Background Image Credit: Generated in QGIS using provisional DSWx products