National Aeronautics and Space Administration

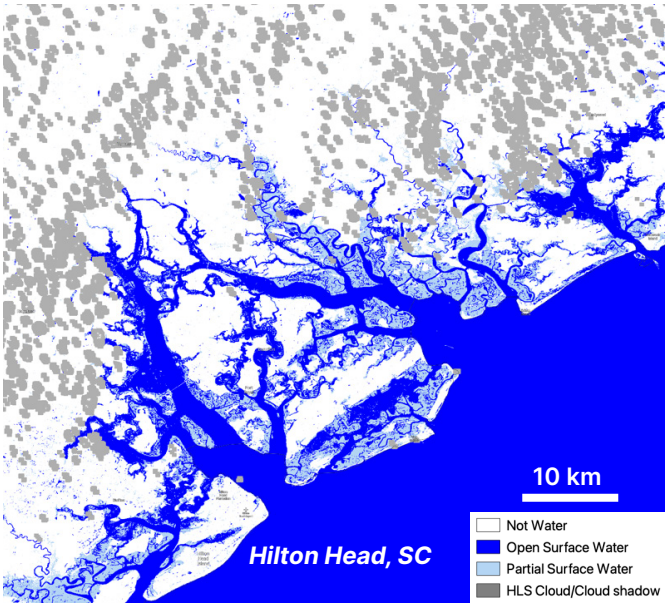
OPERA Dynamic Surface Water Extent Product Suite

Satellite Needs Working Group - Solution 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 and 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 image of the tidal channel networks near Hilton Head, South Carolina. DSWx-HLS maps Open Surface Water (dark blue) and Partial Surface Water (light blue) and Not Water (white), and includes Cloud/Cloud Shadow (gray) from the HLS input mask. These data can be explored in NASA Worldview. https://go.nasa.gov/3ARW4Nc

Credit: OPERA Jet Propulsion Laboratory



Societal Benefit

- 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, day or night, 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	September 2024 - present	Based on NISAR availability
Temporal Frequency	~ 3 days	12 days; 6 days in certain areas	~ 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?

More information on OPERA DSWx products is available on this solution's webpage. The OPERA website provides further information on DSWx and other OPERA products.

OPERA DSWx Webpage

OPERA Website

Background Image Credit: Generated in QGIS using provisional DSWx products

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