

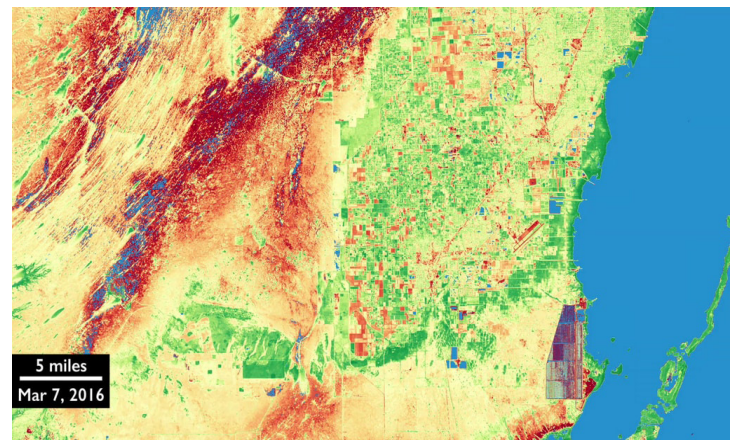


Global HLS-derived Vegetation Indices Suite

Satellite Needs Working Group - Solution Fact Sheet

The SNWG 2016 cycle supported production of the global Harmonized Landsat and Sentinel-2 (HLS) product which provides surface reflectance observations every 2-3 days. The Global HLS-derived Vegetation Indices Suite (HLS-VI) will use HLS surface reflectance data to generate nine vegetation index products including NDVI, EVI, SAVI, MSAVI, NDMI, NDWI, NBR, NBR2, and TVI (described further in the table on the back). These products will provide insight into vegetation density and health by relating multiple HLS bands to parameters such as greenness and water content and providing this information as an instantaneous value, time series, or anomaly. Owing to the advantage of HLS data, vegetation information is provided at a higher temporal (2-3 days) and spatial (30 m) resolution than would be possible using other satellite datasets. This suite of products is analysis-ready and requires minimal data processing prior to application.

The figure (right) shows a map of NDVI in south Florida with the Everglades on the left and agricultural areas on the right. Green indicates healthy vegetation while red indicates bare soil. The HLS-derived suite of vegetation indices will include NDVI along with other common indices.



Credit: NASA Goddard Space Flight Center and Scientific Visualization Studio

Societal Benefit

- Provides nine analysis-ready global vegetation indices at 30 m resolution every 2-3 days, offering the ability to monitor vegetation health, soil properties, and water levels
- Supports climate change adaptation by enabling timely detection of increased crop stress levels, allowing farmers to proactively adjust their irrigation and fertilization strategies
- Facilitates forest management and conservation efforts by providing remote observations of the impacts that drought, deforestation, and wildfires have on forest health and biodiversity
- Detects vegetation health in cities at a relatively high-resolution (30 m) to assist with monitoring the status and health of urban vegetation, critical for urban planning and management
- Promotes more effective water resource management by informing stakeholders on the water quantity needed for irrigation based on the health and productivity of their vegetation



Global HLS-derived Vegetation Indices Suite

HLS-derived Vegetation Indices

Index	Potential Application
Normalized Difference Vegetation Index (NDVI)	Vegetation density, plant health
Enhanced Vegetation Index (EVI)	Corrects NDVI for atmospheric conditions/background noise
Soil-Adjusted Vegetation Index (SAVI)	Corrects NDVI for soil brightness
Modified Soil-Adjusted Vegetation Index (MSAVI)	Minimizes the effect of bare soil on SAVI
Normalized Difference Moisture Index (NDMI)	Vegetation water content
Normalized Difference Water Index (NDWI)	Surface water bodies and change in water content, vegetation water content
Normalized Burn Ratio (NBR)	Burn areas, burn severity
Normalized Burn Ratio 2 (NBR2)	Modifies NBR to highlight vegetation water sensitivity
Triangular Vegetation Index (TVI)	Chlorophyll content, leaf area index (LAI)

Product Characteristics

Platforms	Landsat 8/9 and Sentinel-2A/B
Instruments	Operational Land Imager (OLI) and MultiSpectral Instrument (MSI)
Processing Level	4
Temporal Coverage	April 11, 2013 - Present (Landsat) November 28, 2015 - Present (Sentinel-2)
Temporal Resolution	2-3 days
Latency	2-3 days
Spatial Coverage	Global Land (excludes Antarctica)
Spatial Resolution	30 m
Data Format	Cloud-Optimized GeoTIFF
Spectral Bands	VIS, NIR, SWIR

How do I access this data?

Data for HLS-VI are not yet available but will be distributed through NASA's LP DAAC once operational (late 2024/early 2025).



NASA
LP DAAC

Where can I find more information?

More information on HLS-VI is available on this solution's webpage. More information about HLS products is available on the HLS solution webpage.



HLS-VI Webpage



HLS Webpage

Background Image Credit: USGS