



National Aeronautics and
Space Administration

EARTHDATA

NASA's Worldview, GIBS, and LANCE - Supporting Time Critical Monitoring

IN33E-08 15:20 12/11/2024

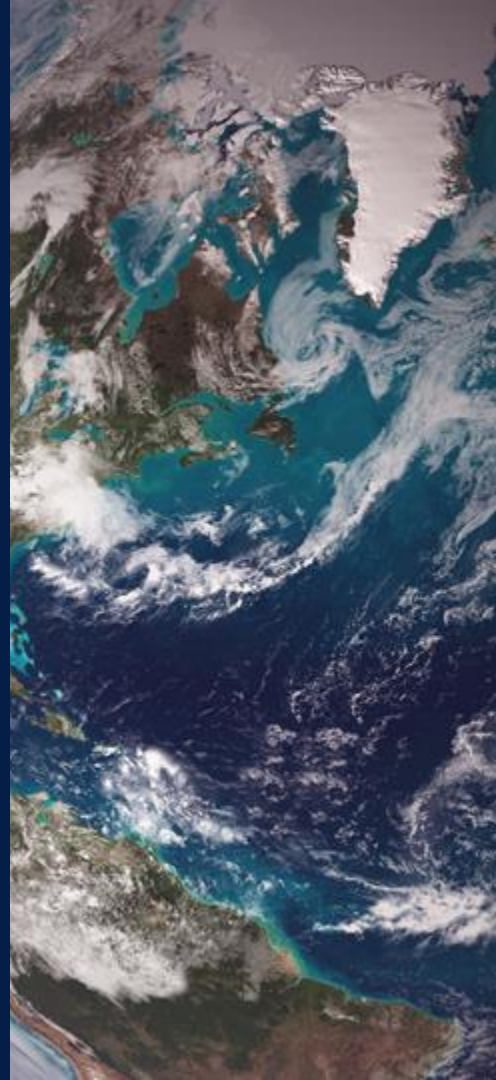
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Engineer

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Davies, Karen Michael, Ryan A Boller and Dawn R
Lowe, NASA Goddard Space Flight Center, Greenbelt,
MD.



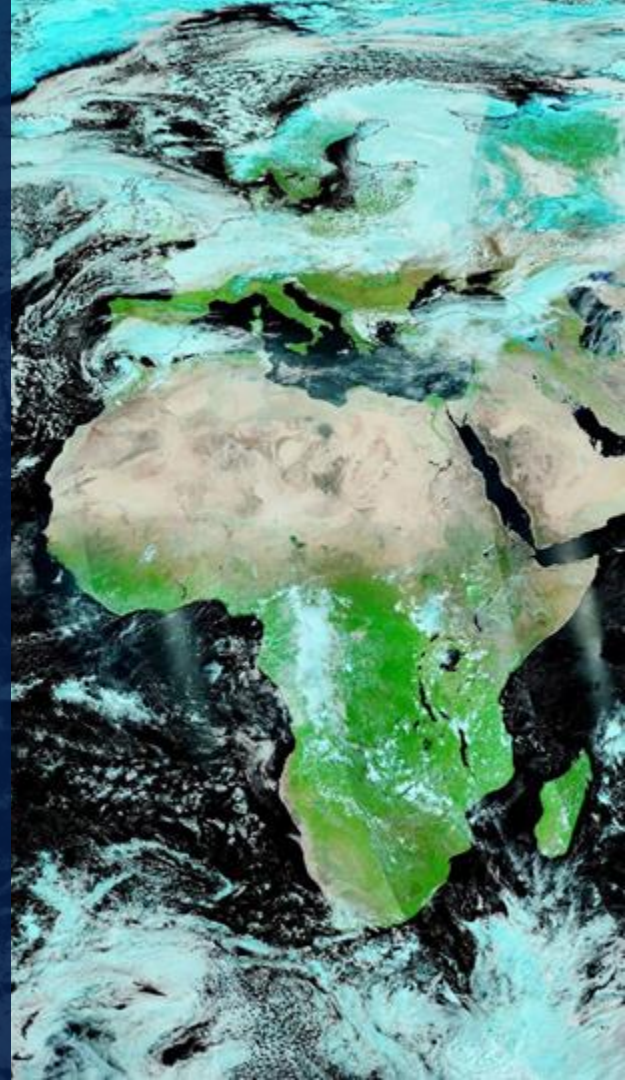
Topics

- What is Worldview, GIBS, and LANCE?
- What makes us unique
- Worldview Demos and Examples
- Future Plans



Worldview, GIBS and LANCE

How the three work together to bring you the latest imagery visualizations!



Land, Atmosphere Near real-time Capability for Earth observations (LANCE)

- Virtual system supports users monitoring a variety of natural and human-created phenomena using near real-time (NRT) data and imagery; available much quicker than routine processing allows.
- Provides NRT data within 3 hours of satellite observation; imagery generally available 3-5 hours after observation through Worldview and GIBS.
- Provides NRT data and imagery from 11 sensors on 10 satellites: AIRS, AMSR2, ATLAS (ICESat-2), MLS, MODIS, MOPITT, OMI, OMPS, SMAP, and VIIRS.

earthdata.nasa.gov/lance

Global Imagery Browse Services (GIBS)

Standardized web services that provide fast and open access to 1000+ global, full-resolution visualizations of NASA Earth Science observations, many products (~200) are available within 3-5 hours after being observed.

- Access via Web Map Tile Service (WMTS), Tiled Web Map Service (TWMS), Web Map Service (WMS), Geospatial Data Abstraction Library (GDAL)
- Imagery in 4 projections: Geographic/Equiarectangular (EPSG:4326), Web Mercator (EPSG: 3857), Arctic Polar Stereographic (EPSG:3413), Antarctic Polar Stereographic (EPSG: 3031)

earthdata.nasa.gov/gibs

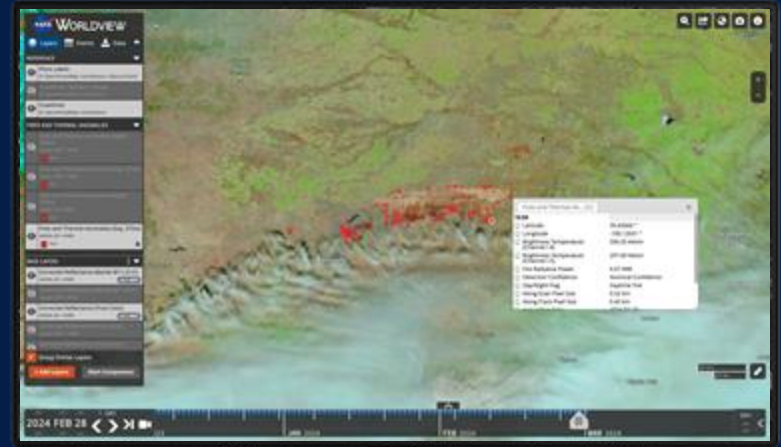


Worldview

Open source web mapping application for users to interactively browse 1000+ NASA's global satellite imagery visualizations within hours of it being acquired, as well as imagery from the past few decades.

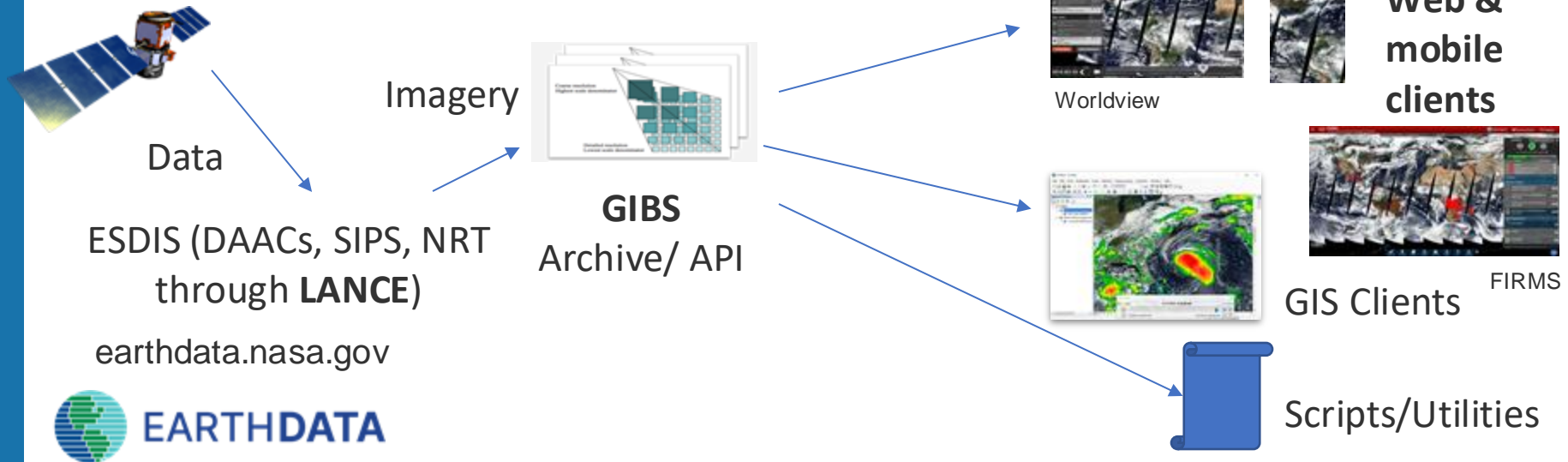
Provides linkages to download data products via Earthdata Search.

worldview.earthdata.nasa.gov



A part of NASA's Earth Science Data and Information System (ESDIS)

ESDIS is responsible for processing, archiving and disseminating NASA's vast collection of data from Earth observing satellite, airborne, and ground based missions, as well as socio-economic data - over 100 petabytes!



What makes Worldview and GIBS unique

- Responsive: Fast maps enable highly interactive usage through time and space (<50ms per request)
- Scalable: 100K daily GIBS users with minimal infrastructure
- Quality and quantity of products:
 - Large catalog (1000+) which can be viewed within the same interface
 - Many available in near real-time through LANCE
 - Imagery providers take care to craft product for end users
- Easy-to-use interface including storytelling capabilities
- Software stack is open source

Worldview and GIBS provide data visualizations, not the original / full-precision data.

Worldview Demos

- Basics of Worldview
- Examples
 - Floods
 - Volcanoes
 - Fires
 - Air Quality

<https://worldview.earthdata.nasa.gov>



Basics of Worldview

The screenshot displays the NASA Worldview web application interface. On the left is a sidebar with the following sections:

- Worldview** (with NASA logo)
- Layers** (active), **Events**, **Data**
- REFERENCE**
 - Place Labels (© OpenStreetMap contributors, Natural Earth)
 - Coastlines / Borders / Roads (© OpenStreetMap contributors)
 - Coastlines (© OpenStreetMap contributors)
- BASE LAYERS**
 - Corrected Reflectance (True Color) NOAA-21 / VIIRS
 - Corrected Reflectance (True Color) NOAA-20 / VIIRS
 - Corrected Reflectance (True Color) Suomi NPP / VIIRS
 - Corrected Reflectance (True Color) Aqua / MODIS
 - Corrected Reflectance (True Color) Terra / MODIS (v6.1 NRT)
- + Add Layers** (button), **Group Similar Layers** (checkbox)
- Start Comparison** (button)

The main content area features a **Welcome to NASA Worldview** banner with the text: "Visually explore the past and the present of this dynamic planet from a satellite's perspective. Select from an array of stories below to learn more about Worldview (a part of NASA Earthdata), the satellite imagery we provide and events occurring around the world. **Start using Worldview**". Below the banner is a grid of story thumbnails:

- Surface Water Extent
- Atmospheric Rivers
- Assessing Floodwaters
- Night Lights from NASA's Black Marble
- Geostationary Imagery Every 10 Minutes!
- Satellite Detections of Fire (2021 update)

At the bottom of the story grid is a checkbox: Do not show until a new story has been added.

The interface also includes a search bar at the top right, a timeline at the bottom showing the date **2024 NOV 27** and navigation controls, and a scale bar in the bottom right corner indicating **1000 km** and **1000 mi**.

Basics: Natural Events

Worldview

Layers Events Data

REFERENCE

- Place Labels
- Coastlines / Borders / Roads
- Coastlines

BASE LAYERS

- Corrected Reflectance (True Color) NOAA-21 / VIIRS
- Corrected Reflectance (True Color) NOAA-20 / VIIRS
- Corrected Reflectance (True Color) Suomi NPP / VIIRS
- Corrected Reflectance (True Color) Aqua / MODIS
- Corrected Reflectance (True Color) Terra / MODIS v6.1 NRT

+ Add Layers Group Similar Layers

Start Comparison

Welcome to NASA Worldview

Visually explore the past and the present of this dynamic planet from a satellite's perspective. Select from an array of stories below to learn more about Worldview (a part of NASA Earthdata), the satellite imagery we provide and events occurring around the world. Start using Worldview

- Surface Water Extent
- Atmospheric Rivers
- Assessing Floodwaters
- Night Lights from NASA's Black Marble
- Geostationary Imagery Every 10 Minutes!
- Satellite Detections of Fire (2021 update)

Do not show until a new story has been added.

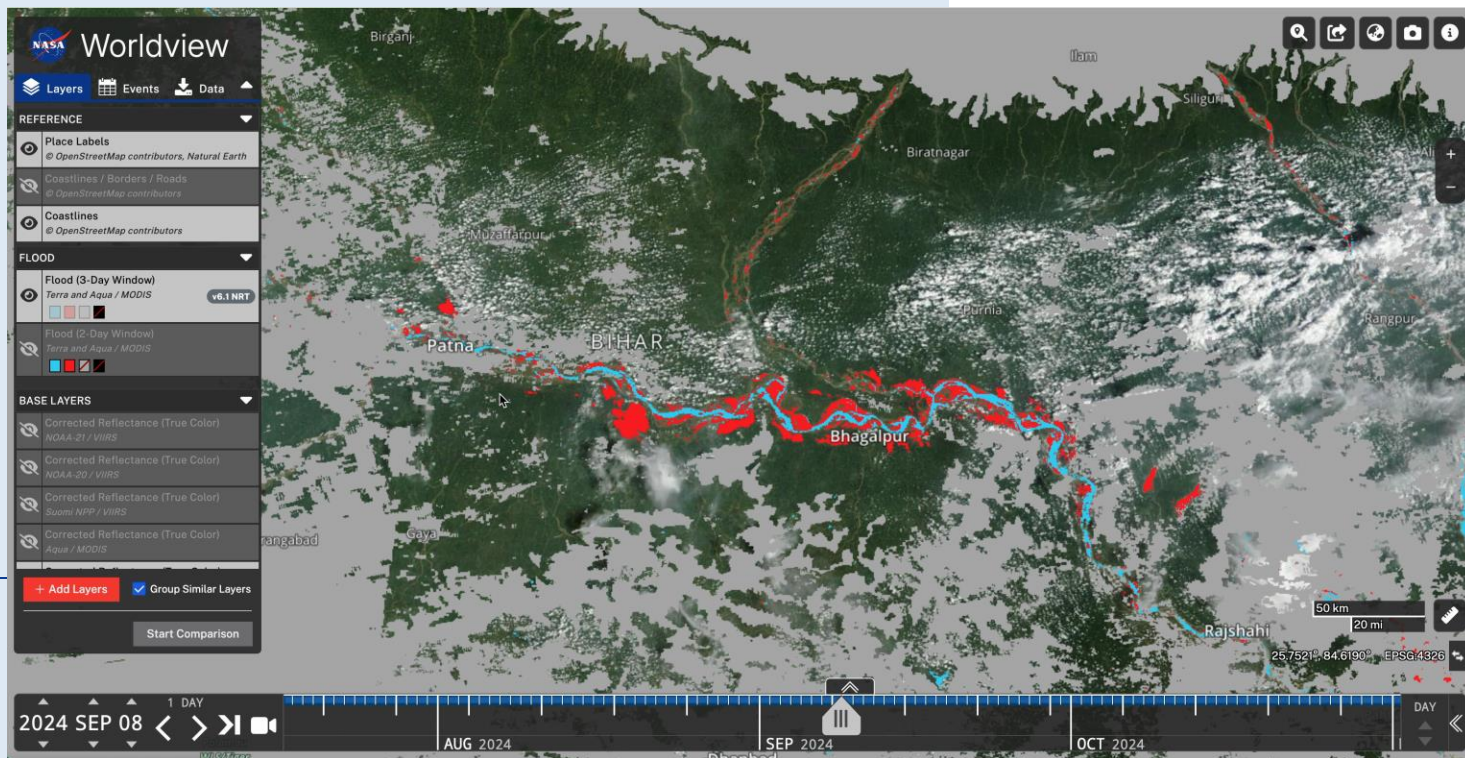
2024 NOV 27 1 DAY

24 OCT 2024 NOV 2024 DAY

Basics: Tour Stories and Data Download

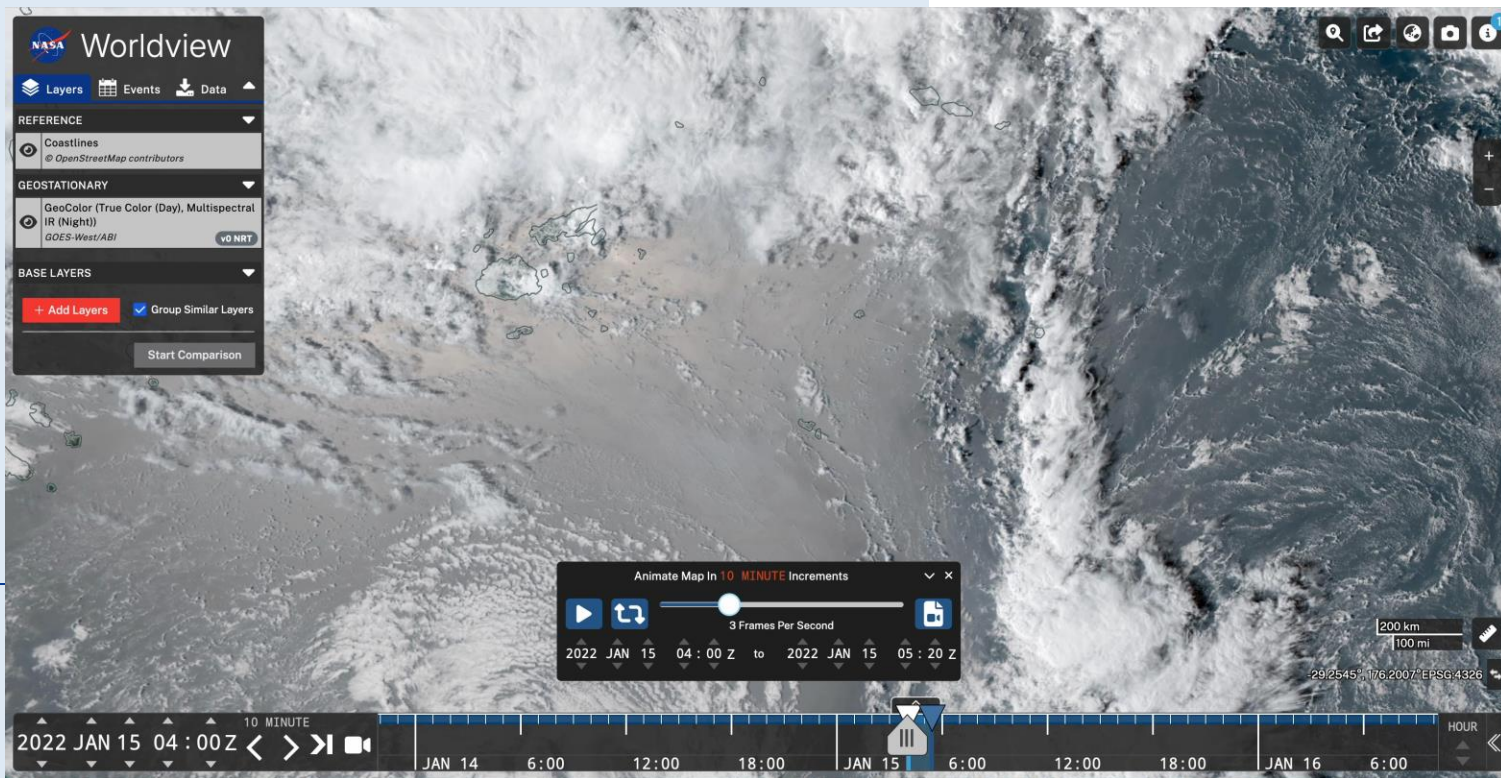
The screenshot displays the NASA Worldview web application interface. On the left is a sidebar with navigation options: 'Layers', 'Events', and 'Data'. Below these are sections for 'REFERENCE' (Place Labels, Coastlines / Borders / Roads, Coastlines) and 'BASE LAYERS' (Corrected Reflectance from various sensors like NOAA-21, Suomi NPP, Aqua, and Terra). A '+ Add Layers' button and 'Group Similar Layers' checkbox are also present. The main area shows a satellite map of Africa with a 'Welcome to NASA Worldview' dialog box overlaid. The dialog box contains a welcome message and a grid of nine story thumbnails: 'El Niño Impacts Around the Globe', 'Surface Water Extent', 'Atmospheric Rivers', 'Assessing Floodwaters', 'Night Lights from NASA's Black Marble', 'Geostationary Imagery Every 10 Minutes!', and a 'Do not show until a new story has been added.' checkbox. The bottom of the interface features a timeline for '2024 NOV 27' and 'OCT 2024', along with a scale bar (1000 km) and coordinates (49.8698°, 58.8159°, EPSG:4326).

Floods



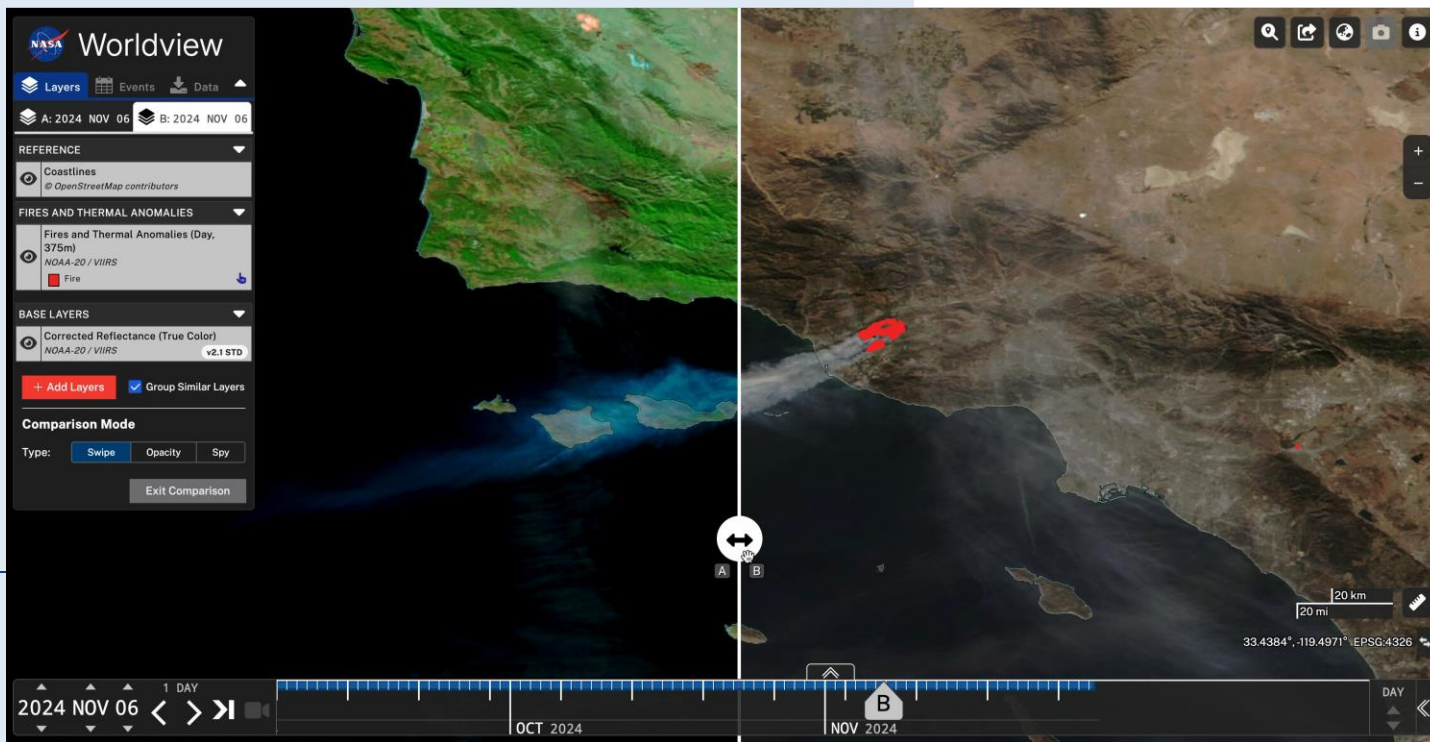
Seasonal flooding along the Ganges River in Bihar, India, September 2024, identified in NASA's MODIS NRT Global Flood Product. <https://go.nasa.gov/416zhlU>

Volcanoes



Eruption of Hunga Tonga - Hunga Ha'apai Volcano <https://go.nasa.gov/3pHf0Ff>

Fires



Mountain Fire, Ventura County, California. Image captured on Nov 6, 2024, by the VIIRS instrument aboard the NOAA-20 satellite. <https://go.nasa.gov/3ZpA7i9>

Air Quality

Home / News / Worldview Image of The Week / Smog Over Pakistan

Smog over Pakistan

Base corrected reflectance image acquired on Nov 12, 2024, with aerosol index overlaid with ground-based aerosol optical depth measurements.

2 MIN READ

NOV 14, 2024

WORLDVIEW IMAGE OF THE WEEK

Worldview

AEROSOL OPTICAL DEPTH

Aerosol Optical Depth 500nm (Daily)

AERONET

Inactive Site

Aerosol Optical Depth

0.0 0.5

AEROSOL INDEX

Aerosol Index

Suomi NPP / OMP5

0.0 0.5

BASE LAYERS

Clouds (Global Data S2)

RAJASTHAN

UTTAR PRADESH

NEPAL

Hyderabad

Embedded Worldview showing smog over Pakistan on November 12, 2024
<https://earthdata.nasa.gov/news/worldview-image-archive/smog-over-pakistan>

Future Plans

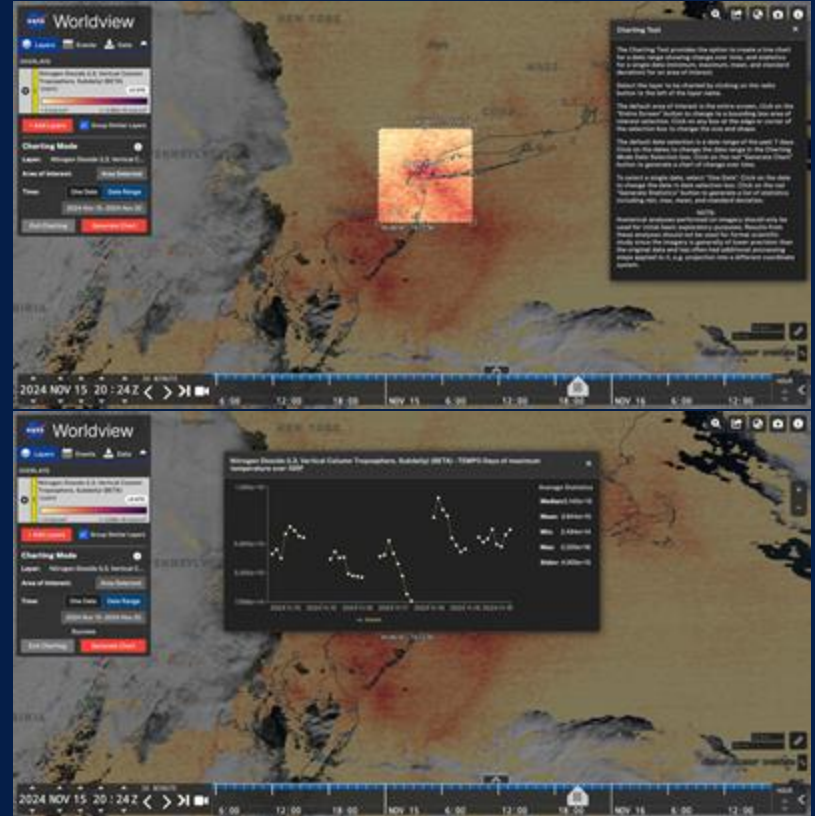
- Charting Tool
 - Vector Flow Visualizations
-



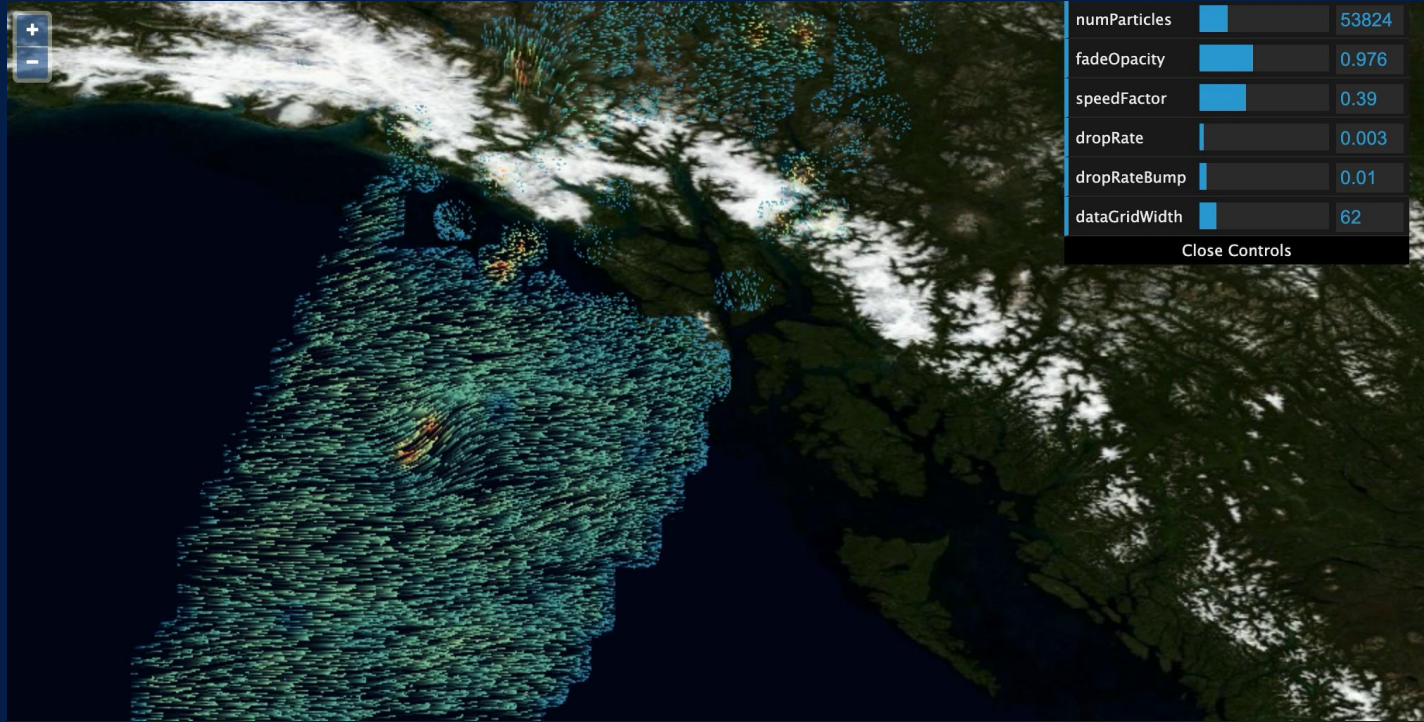
Near term: Charting Tool

Allows users to perform initial, basic exploration of imagery visualization values (for palette visualization layers) via two options:

- Showing change over time with a line chart for a date range for an area of interest and basic average statistics (minimum, maximum, mean, and standard deviation)
- Basic statistics for a single date for an area of interest.



Mid-term: Vector Flow Visualizations





Visit Us!

Visit: worldview.earthdata.nasa.gov

Contribute: github.com/nasa-gibs/worldview

Bring imagery into your own web application or GIS client:
earthdata.nasa.gov/gibs

Learn more about near-real data: earthdata.nasa.gov/lance

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Backup

- Notable Features of Worldview
 - Metrics
 - Unique User IPs accessing Worldview FY 2024
 - Most Requested Layers from Worldview in FY 2024
-



Notable Features of Worldview

Tour Stories: Learn how to use Worldview, how to visualize certain imagery layers, and explore interesting past natural events.

Layer Picker: Pick layers of interest from over 1000 imagery layers

Animation: Ability to create animations and export to animated GIFs

Comparison: Allows users to compare imagery side by side

Share and Embed: Allows users to embed Worldview onto their own webpage

Events: Provides a curated listing of events provided through the Earth Observatory Natural Event Tracker (EONET)

Data Download: Download source data via Earthdata Search



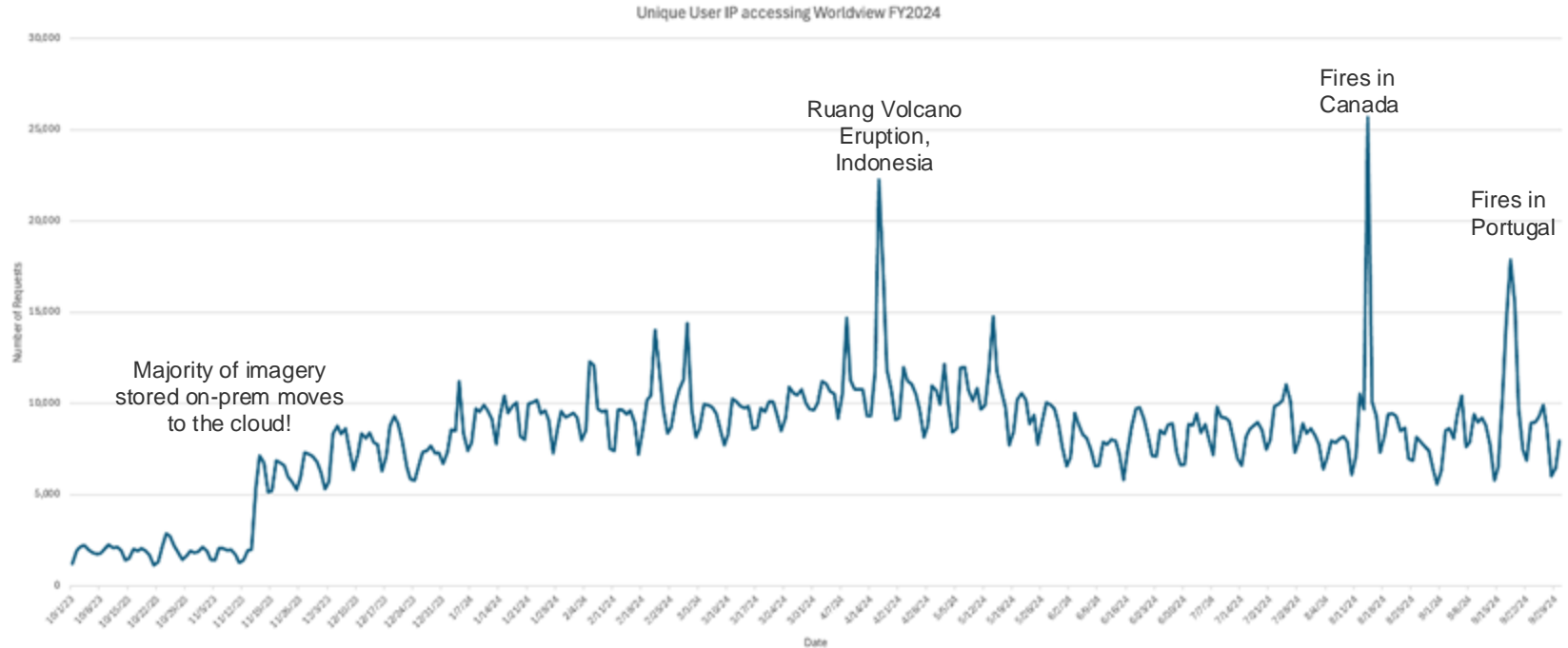
Worldview Metrics

- Unique User IPs accessing Worldview FY 2024
- Most Requested Layers from Worldview in FY 2024

Image caption text goes here.



Metrics - Unique User IPs accessing Worldview FY2024



Metrics - Most Requested Layers in Worldview FY2024

