



National Aeronautics
and
Space Administration

EARTHDATA

NASA's Fire Information for Resource Management System (FIRMS): supporting wildfire monitoring and management through successful collaborations and by enabling innovative applications

Wednesday, 11 December, 14:10 – 15:40 EST



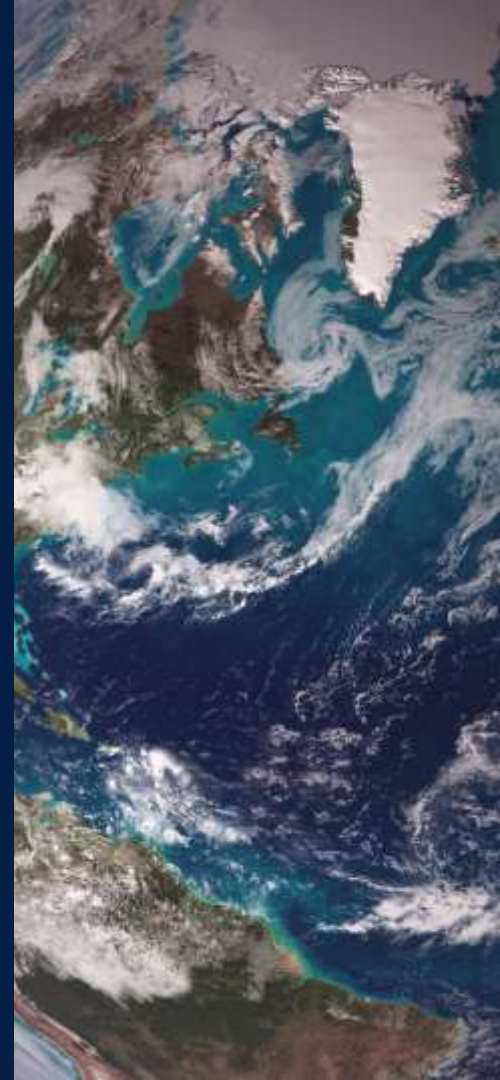
Contributors

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¹NASA GSFC,

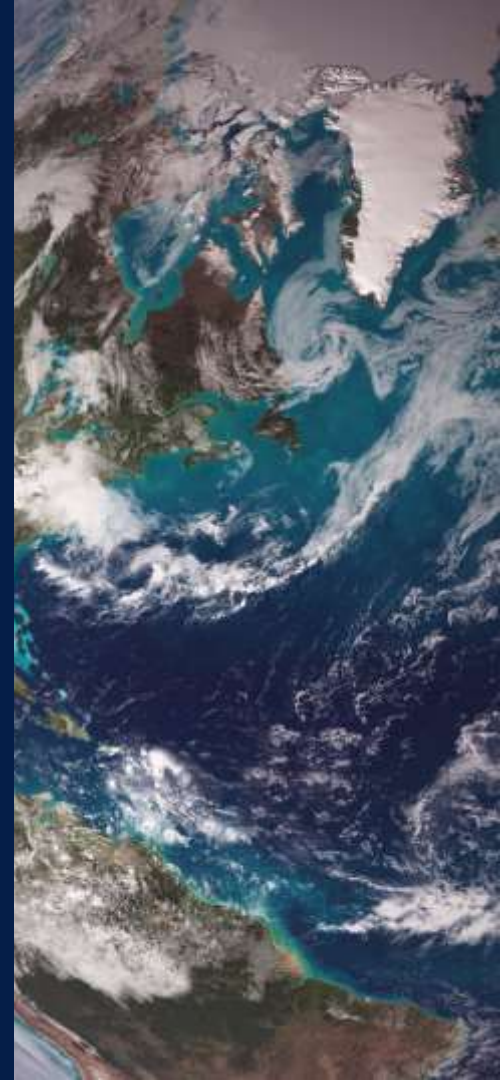
²USDA Forest Service,

³University of Maryland



Overview

1. History of FIRMS
2. Partnerships and collaborations
3. Amplifying use among diverse stakeholders
4. Supporting innovative applications
5. Collaborative engagement
6. Continued evolution of FIRMS

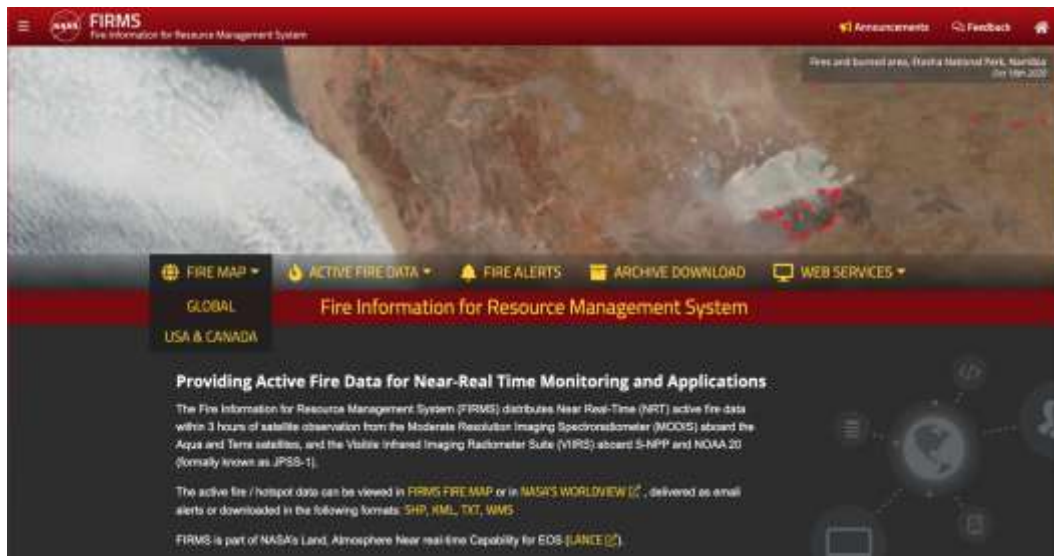


1. History of FIRMS



1. History of FIRMS

- ❑ Developed at the University of Maryland
- ❑ Based on data from MODIS Rapid Response System
- ❑ System of capabilities
- ❑ Transitioned to NASA LANCE in 2012



2. Partnerships & collaborations



2. Partnerships & collaborations

- ❑ USDA Forest Service
- ❑ University of Maryland

- ❑ Federal Agencies
- ❑ National Governments
- ❑ Provincial Governments
- ❑ State Governments
- ❑ International Wildfire Initiatives
- ❑ International Space Agencies
- ❑ Private Sector



3. Amplifying use among diverse stakeholders

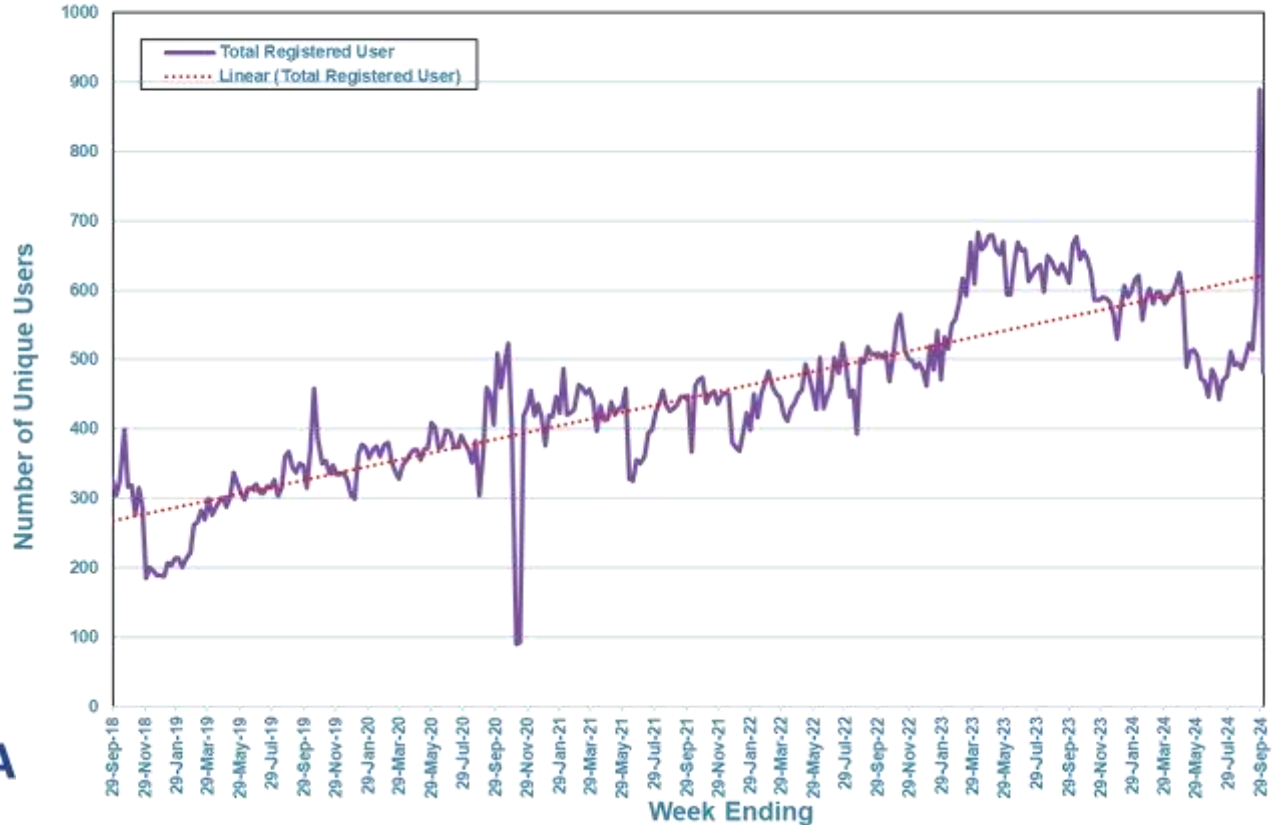


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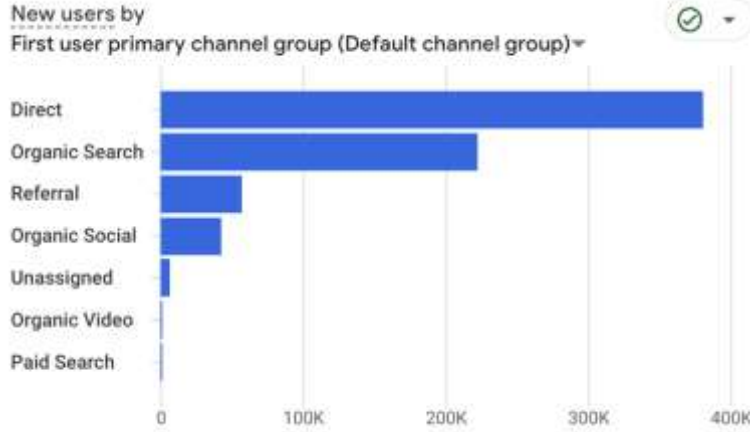
3. Amplifying use among diverse stakeholders

- ☐ Includes FIRM
- ☐ Continued increase in users (total registered user)
- ☐ Continued increase in **unique users**

Weekly LANCE Registered Unique Users Accessing Data
(October 1, 2018 - September 30, 2024)



3. Amplifying use among diverse stakeholders



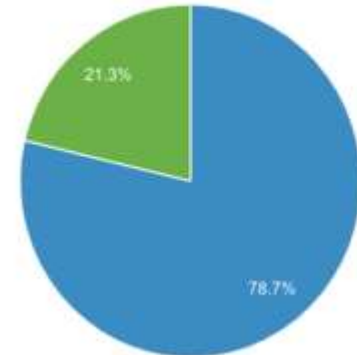
Users by Country



COUNTRY	USERS
United States	265K
Canada	80K
Chile	74K
Thailand	30K
Russia	20K
Germany	18K
India	18K



New Visitor Returning Visitor



4. Supporting innovative applications



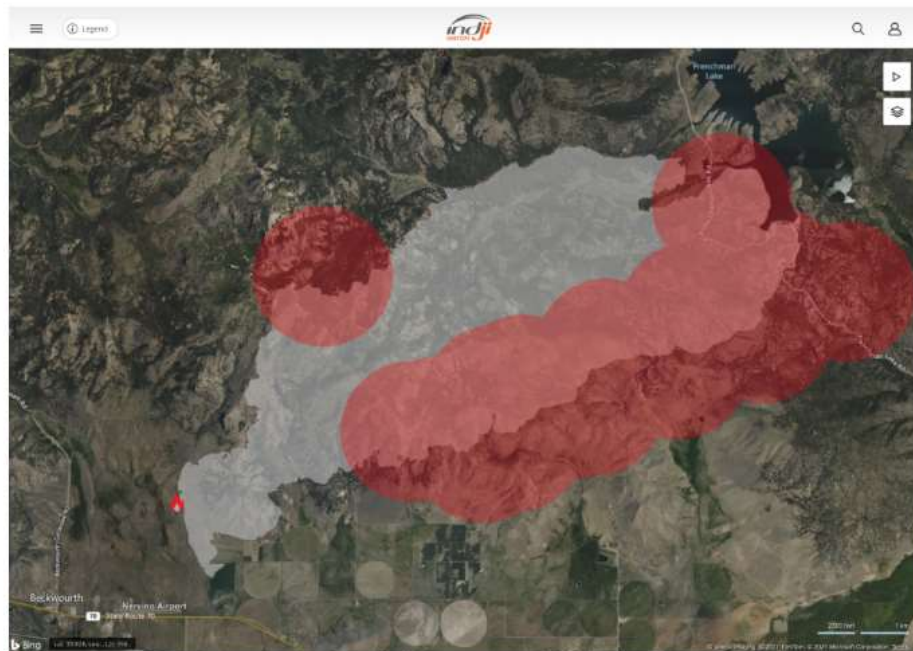
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4. Supporting innovative applications

- ❑ Private Sector:
 - ❑ infrastructure asset alert system
- ❑ Country-level:
 - ❑ monitoring dashboard
- ❑ Provincial-level:
 - ❑ mapping & modeling tools
- ❑ Interagency-level:
 - ❑ scalable decision support

4. Supporting innovative applications: private sector

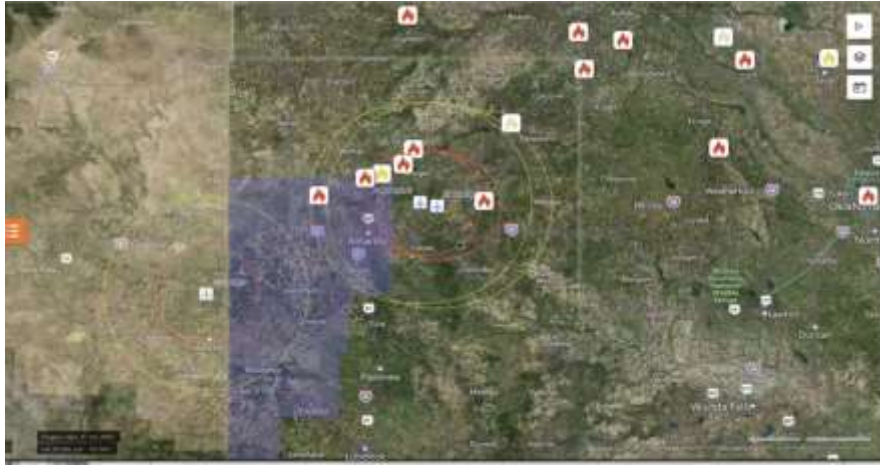
- ❑ Indji Watch
- ❑ Utility & renewable energy companies
- ❑ Remote hazard monitoring



This screen capture from Indji Watch shows a wildfire in northern California. The red flame icon identifies the reported location of the fire. The gray area identifies the fire perimeter and the red areas indicate areas of fire activity. This active fire information is derived from FIRMS hotspot data. Credit: Indji Systems.

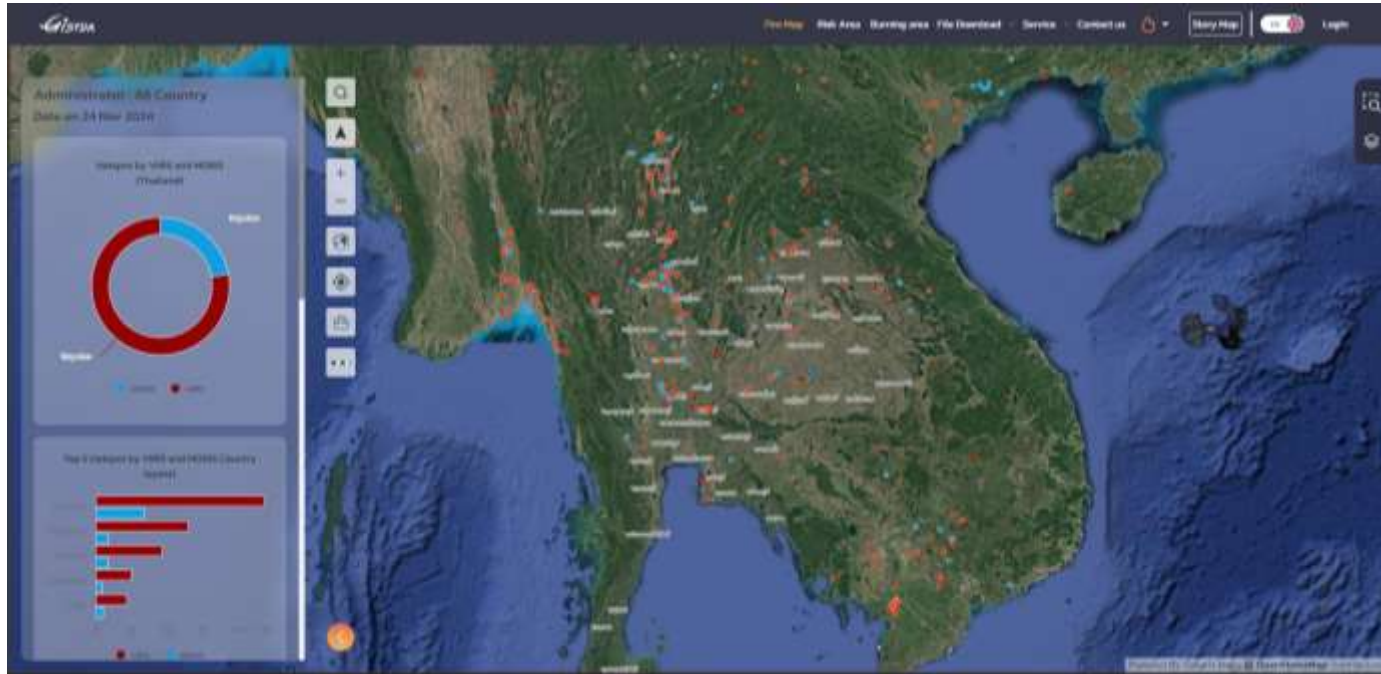


4. Supporting innovative applications: country-level monitoring dashboard



Alert systems identify wildfire risk to infrastructure (airports, transmission lines)

4. Supporting innovative applications: country-level monitoring dashboard

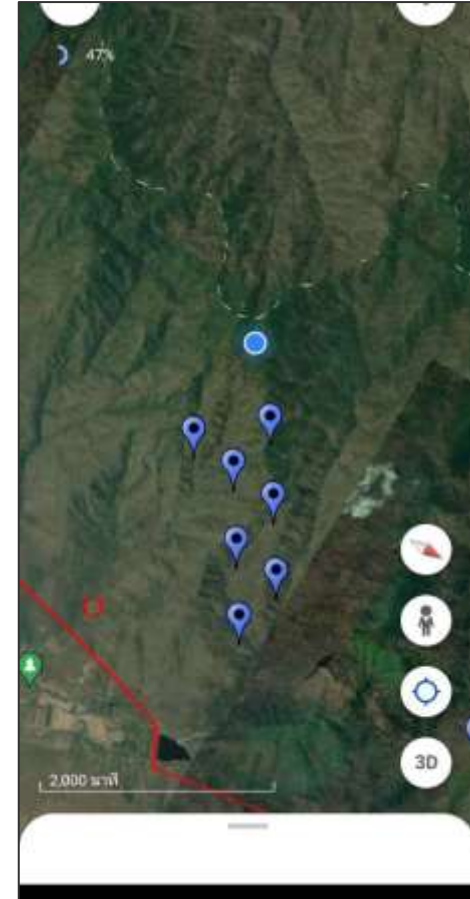
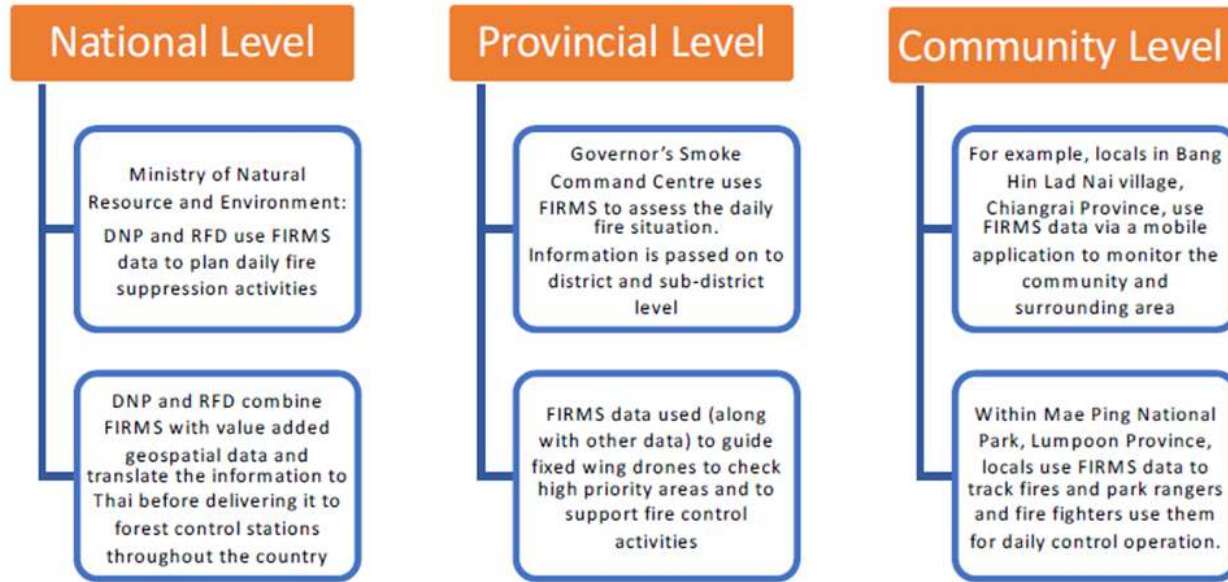


FIRMS data are incorporated into national, provincial, & community-level dashboards, maps, mobile devices in Thailand

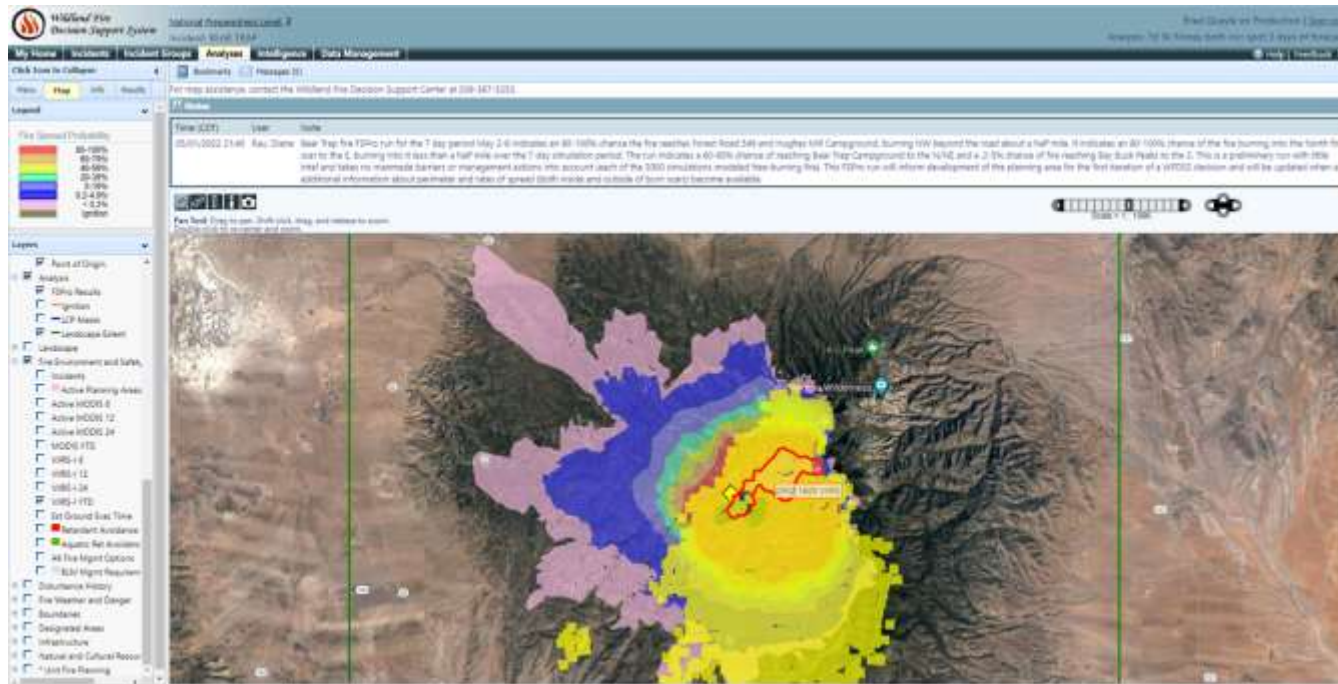


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4. Supporting innovative applications: country-level monitoring dashboard



4. Supporting innovative applications: interagency-level scalable decision support



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Applications to assess current / forecasted conditions
and inform suppression decisions

5. Collaborative engagement



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5. Collaborative engagement

- ❑ Knowledge exchange
- ❑ Outreach activities
- ❑ Building awareness around expanding FIRMS capabilities

5. Collaborative engagement

- ❑ Knowledge exchange/stakeholder engagement
 - ❑ Understand needs/experiences with FIRMS
 - ❑ WFIGS interagency fire perimeters
 - ❑ Provincial-level download options
 - ❑ User interface feedback
 - ❑ Identify potential new products
 - ❑ Generation of wildfire statistics

5. Collaborative engagement

- ❑ Outreach Activities
 - ❑ Conferences
 - ❑ Presentations to multiagency groups
 - ❑ *One-off* opportunities
 - ❑ International wildfire initiatives
 - ❑ Technical expert meetings

5. Collaborative engagement

- ❑ Building awareness around expanding FIRMS capabilities
 - ❑ Earthdata webinars
 - ❑ Engagement with key stakeholders
 - ❑ Pre-post-season check-ins
 - ❑ What worked/did not
 - ❑ FIRMS feedback form
 - ❑ Blog
 - ❑ ARSET trainings

6. Continued evolution of FIRMS



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6. Continued evolution of FIRMS

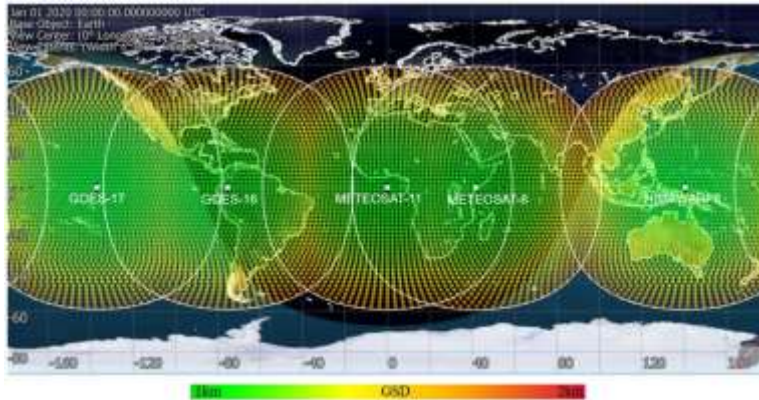
- MODIS and VIIRS "micro granules" are instantly transferred to UWisc/SSEC during satellite overpass.
- Level 0 to Level 2 processing conducted using NASA science algorithms.
- Derived active fire detection data available < 1 minute of satellite observation.
- Data available within FIRMS within 2 minutes.

NOAA-20: April 19, 2023, 20:09 UTC/14:09 MDT

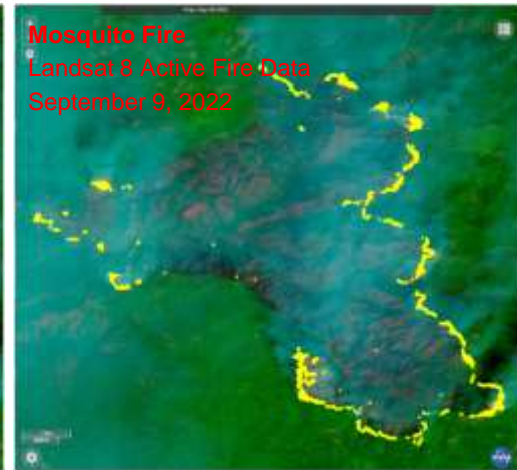
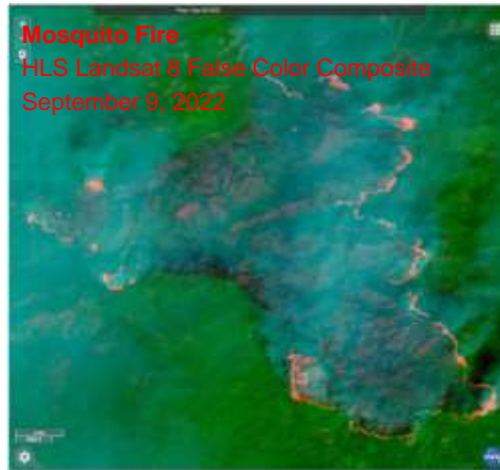
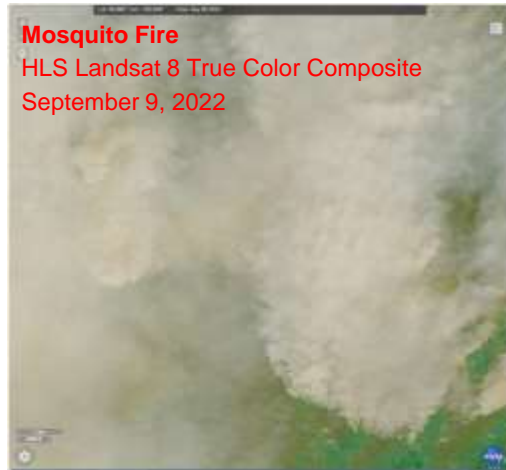
The screenshot displays the FIRMS US/CANADA web interface. The main view shows a satellite image of a forest fire with a data table overlaid. The table has columns for 'Longitude', 'Latitude', 'Temperature', 'Emissivity', 'Fire Type', 'Fire Size', 'Fire Intensity', 'Fire Age', and 'Fire Status'. Two rows in the table are highlighted with red boxes. The sidebar on the right shows a 'CURRENT' status and a list of data layers, including 'MODIS-1 Aqua', 'MODIS-1 Terra', and 'VIIRS-1 NPP'. A 'Legend' panel is also visible, showing various data layers and their corresponding colors. The bottom right corner of the interface shows the time '2:11 PM 4/19/23'.

6. Continued evolution of FIRMS

- ❑ Global harmonized multi-sensor data stream developed under auspices of NASA Applied Sciences Program
- ❑ Observations every 10-15 minutes and available in FIRMS within 30 minutes
- ❑ Beta/provisional products
- ❑ Filtering thresholds applied



6. Continued evolution



RT US/Canada Landsat Active Fire Data in FIRMS

6. Continued evolution

Recent identification/integration of data products & capabilities

- Black Marble – at-sensor radiance (Goat and Lava)
- Black marble – blue-yellow band (Park Fire)
- Static Thermal Anomalies
- Experimental Mode
- NRT VIIRS BA product*
- Expansion of URT*

*on the horizon

6. Continued evolution

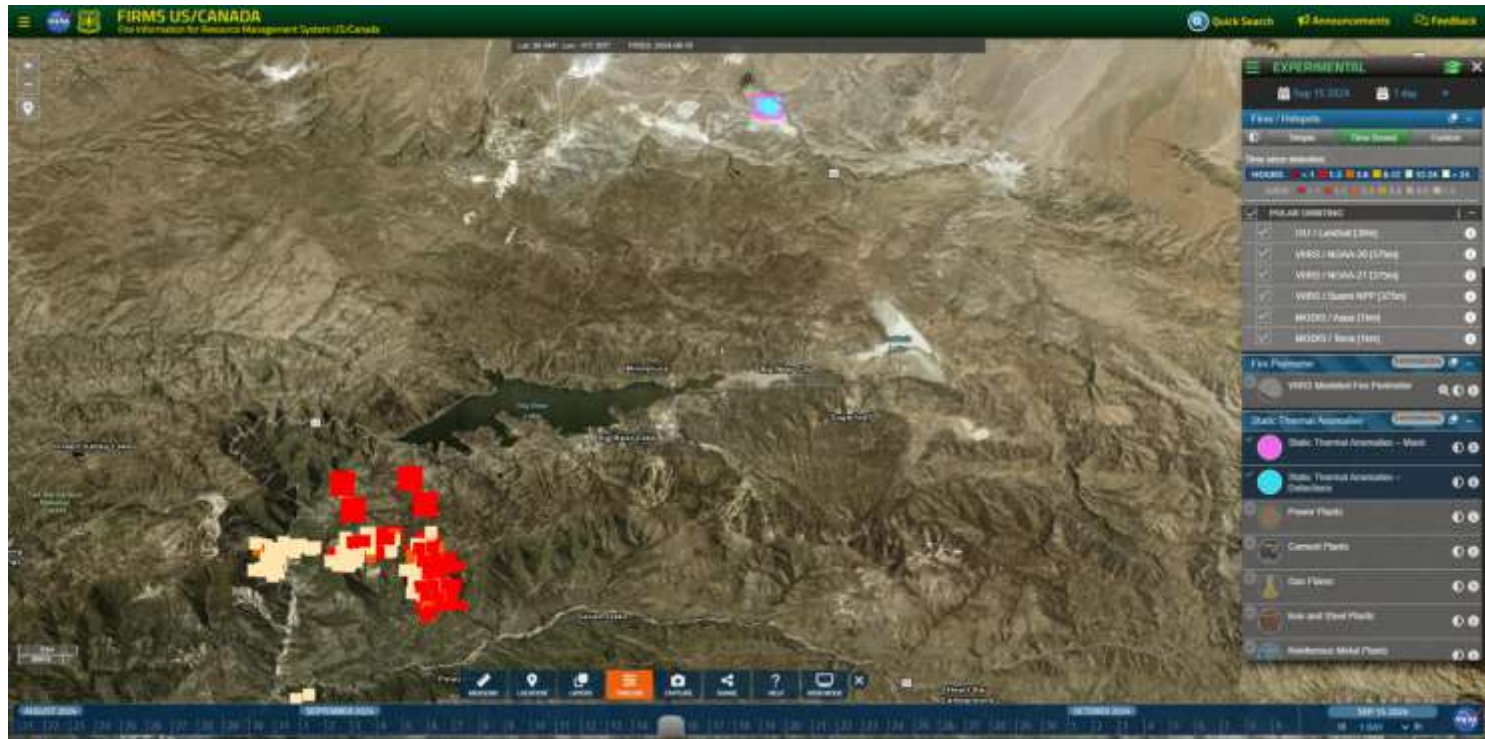


S-NPP VIIRS false color composite
8/6/2024 14:53 UTC



S-NPP VIIRS Black Marble – at-
sensor radiance
8/7/2024 3:09 UTC

6. Continued evolution

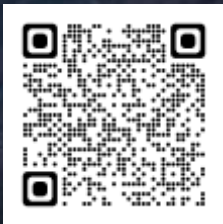


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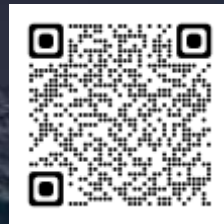
earthdata.nasa.gov

Thank You

For more information on FIRMS & LANCE



FIRMS US/Canada



FIRMS Global



NASA LANCE