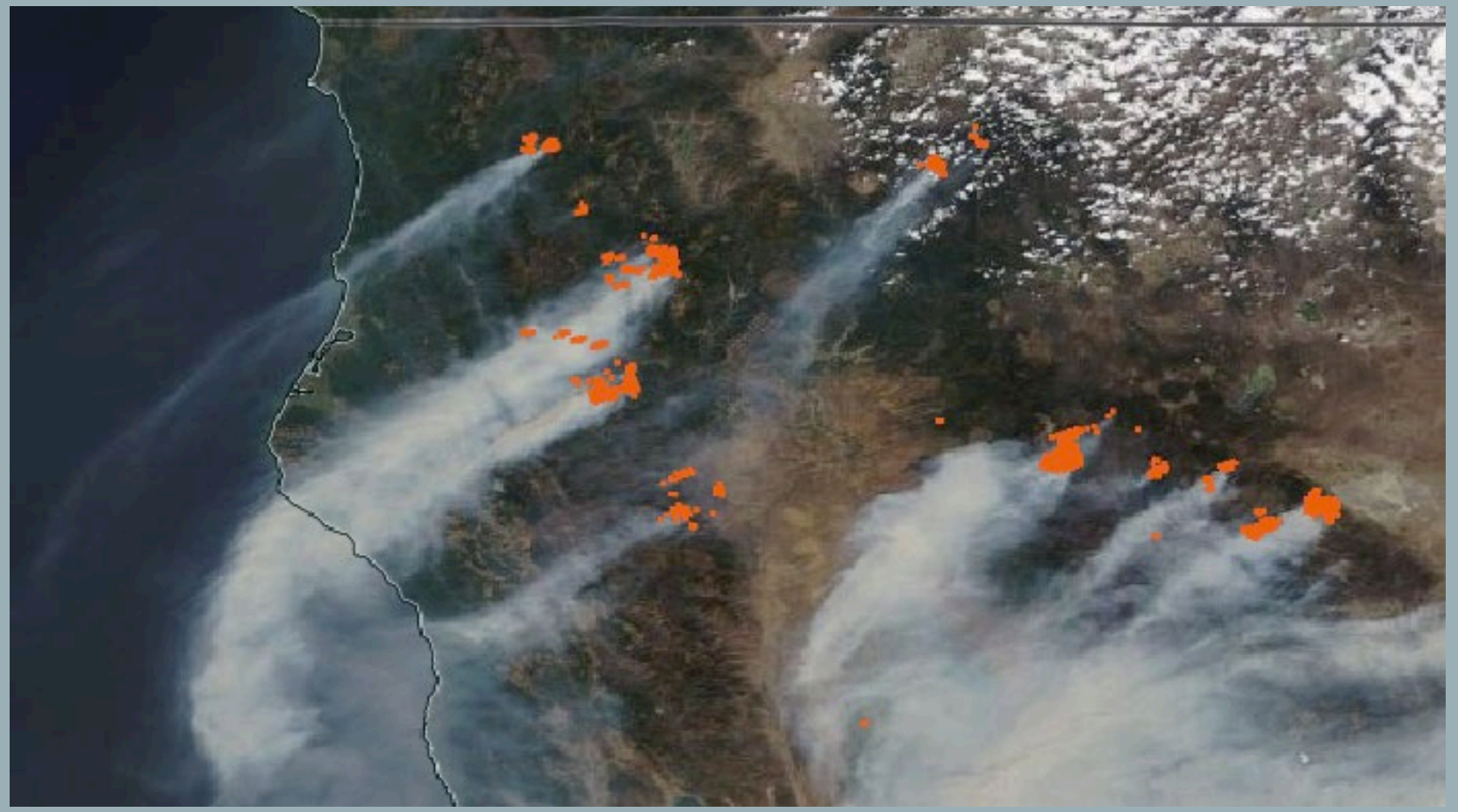
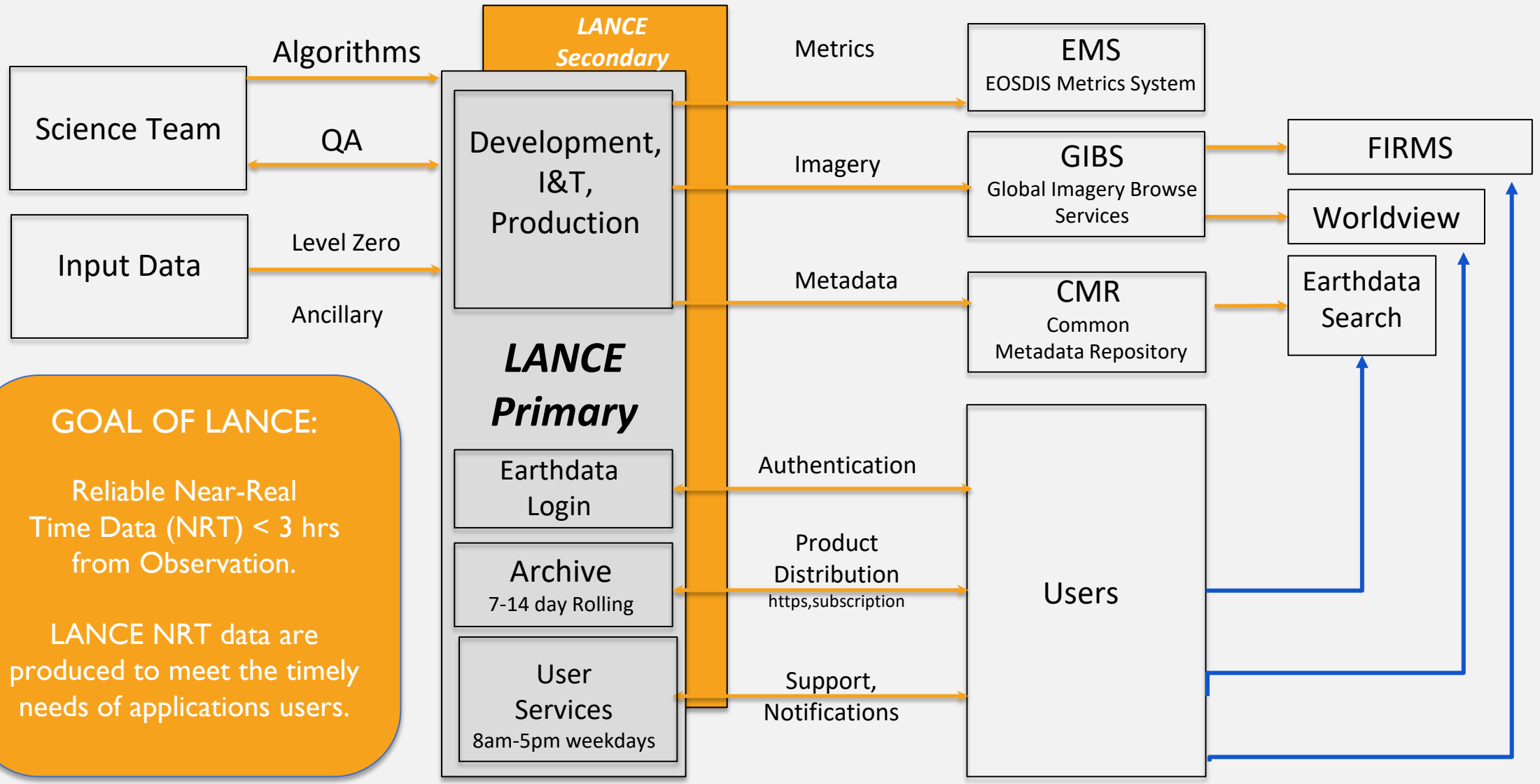
Updates on NASA FIRMS and FIRMS US/Canada



Diane Davies, LANCE Operations Manager

Brad Quayle (USFS). Otmar Olsina, Greg Ederer, Asen Radov (NASA GSFC)

LANCE IN A NUTSHELL

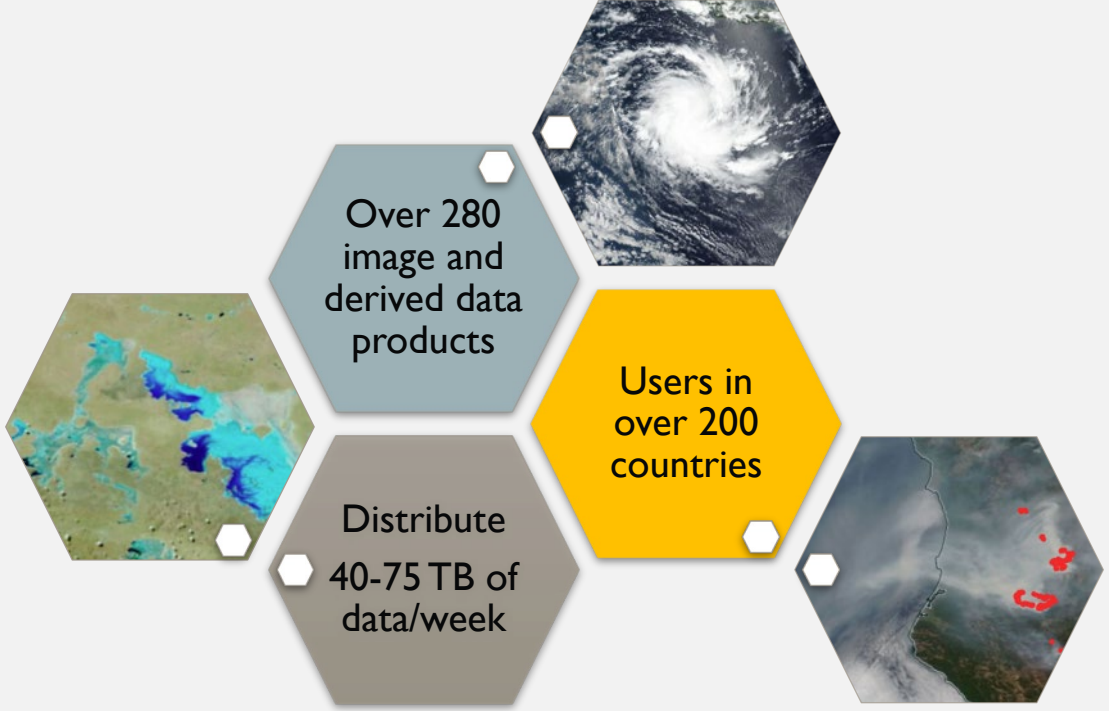


GOAL OF LANCE:

Reliable Near-Real Time Data (NRT) < 3 hrs from Observation.

LANCE NRT data are produced to meet the timely needs of applications users.

LANCE DISTRIBUTION

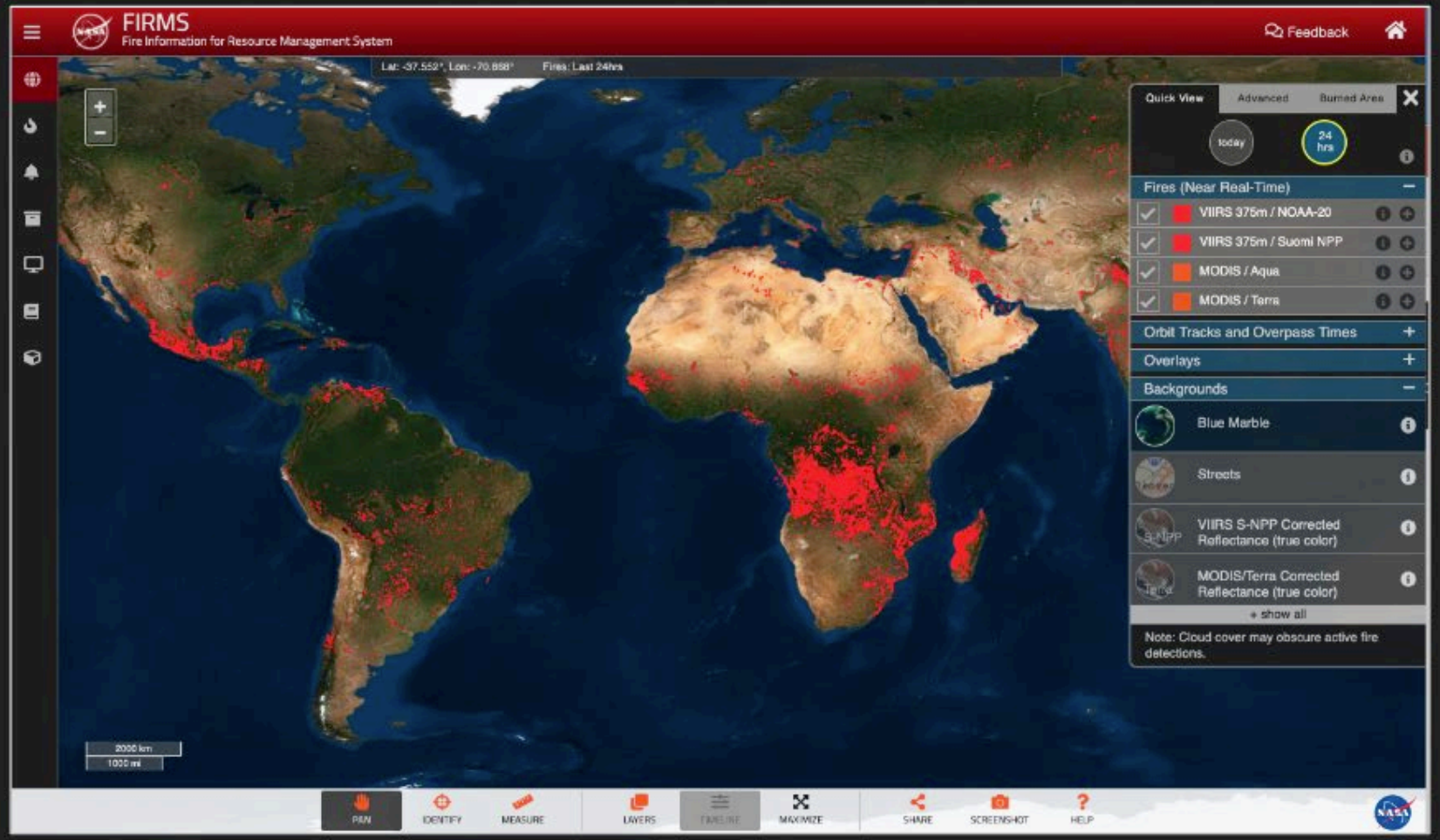


- AIRS - Atmospheric Infrared Sounder
- AMSR2 - Advanced Microwave Scanning Radiometer 2
- LIS ISS - Lightning Imaging Sensor on the International Space Station
- ICESat-2 - Advanced Topographic Altimeter System (ATLAS) on the Ice, Cloud, and land Elevation Satellite
- MISR - Multi-angle Imaging SpectroRadiometer
- MLS - Microwave Limb Sounder
- MODIS - Moderate Resolution Imaging Spectroradiometer
- MOPITT - Measurements of Pollution in the Troposphere
- OMI - Ozone Monitoring Instrument
- OMPS - Ozone Mapping and Profiler Suite
- VIIRS-Atmosphere - Visible Infrared Imaging Radiometer Suite
- VIIRS-Land - Visible Infrared Imaging Radiometer Suite

Fire Information for Resource Management System (FIRMS)

Originally developed at the University of Maryland. It was funded by NASA's Applied Sciences and the United Nations (UN) Food and Agriculture Organization (FAO) using data from MODIS Rapid Response

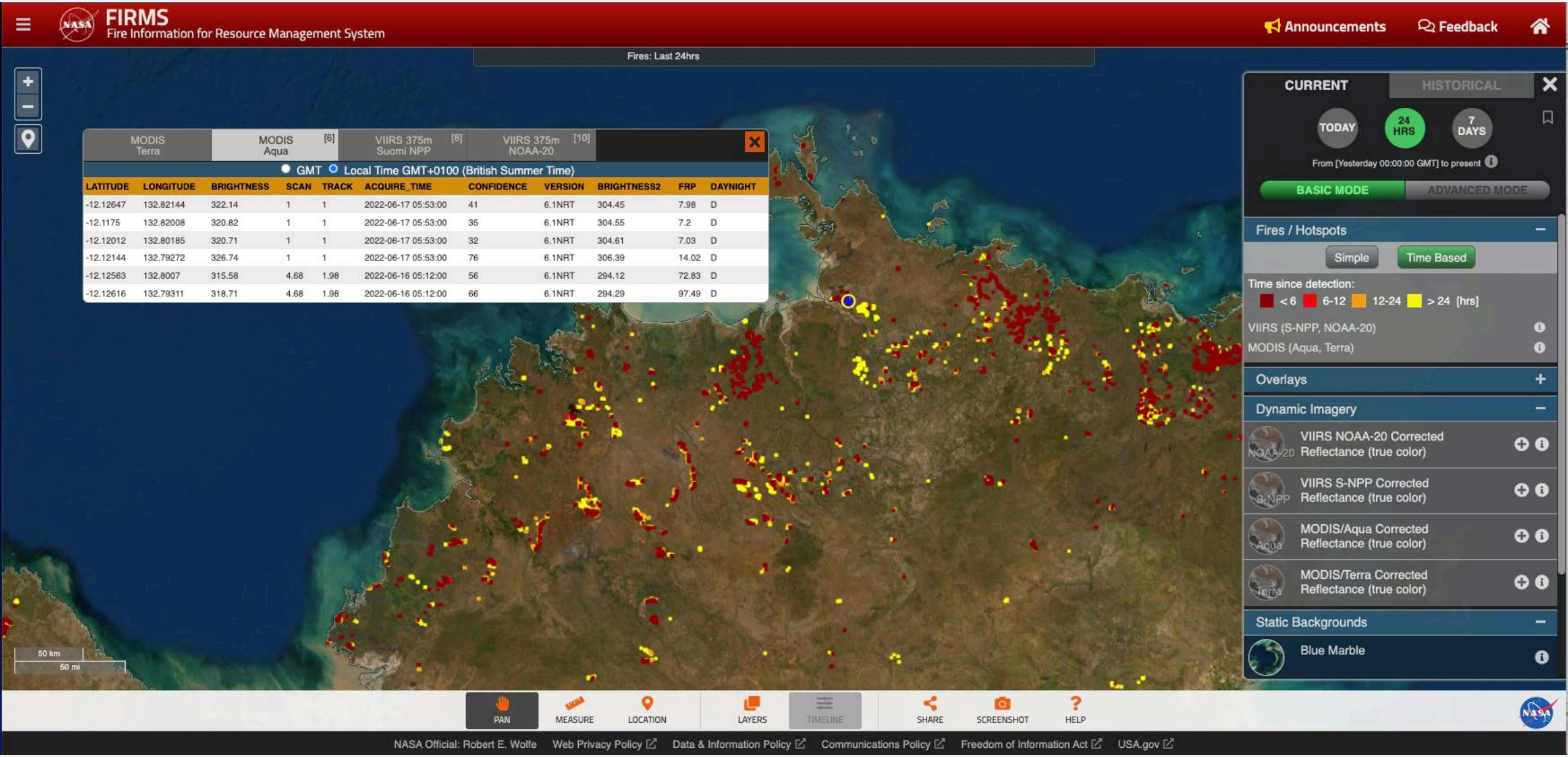
FIRMS became part of LANCE in 2012. In 2020 the USFS approached NASA to develop FIRMS US/Canada. The prototype was released in January 2021.



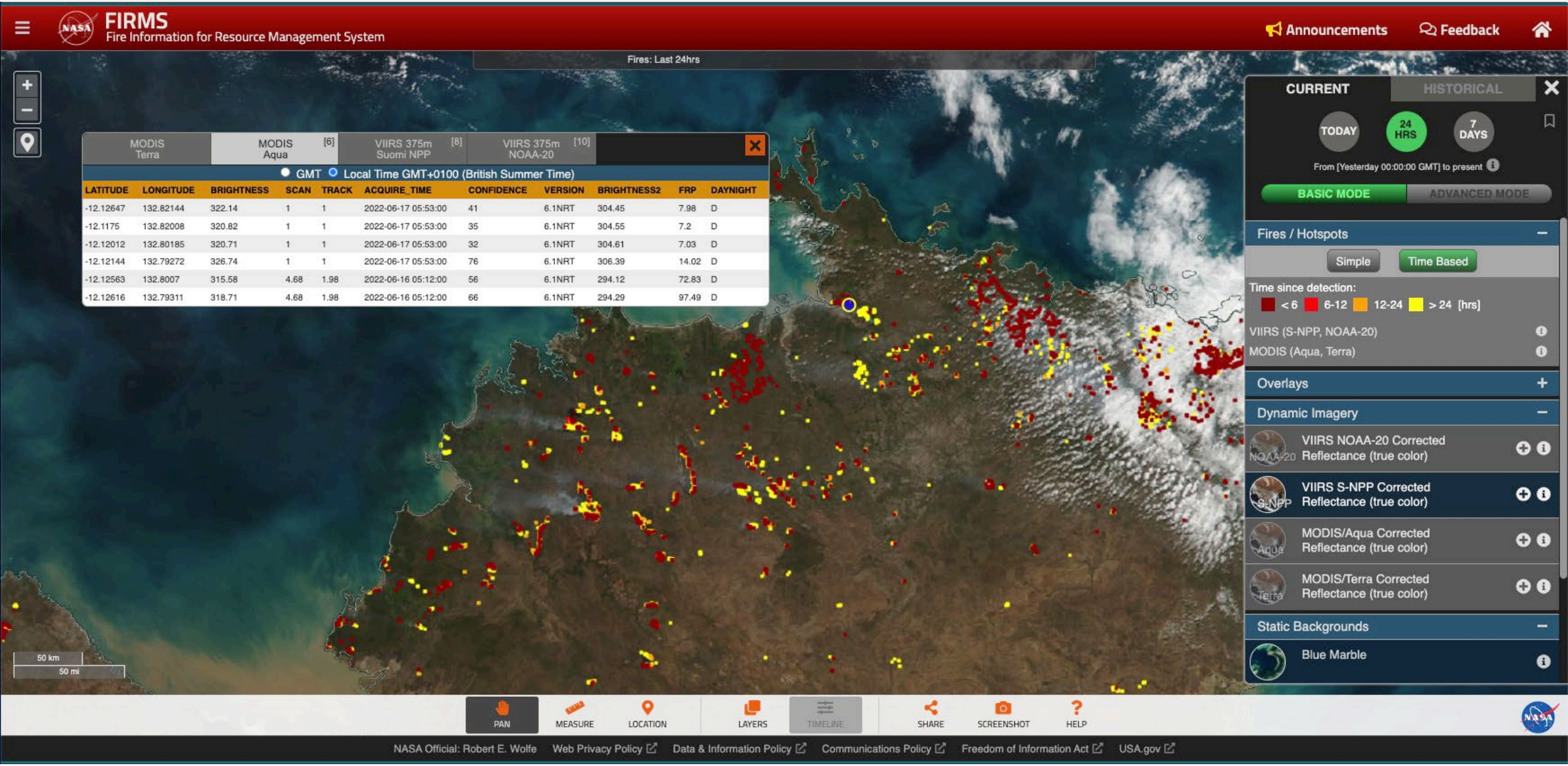
FIRMS & FIRMS US/CANADA

NEW FEATURES ADDED TO FIRMS

(GLOBAL AND US/CANADA)



FIRMS: BASIC AND ADVANCED MODE



FIRMS: BASIC AND ADVANCED MODE

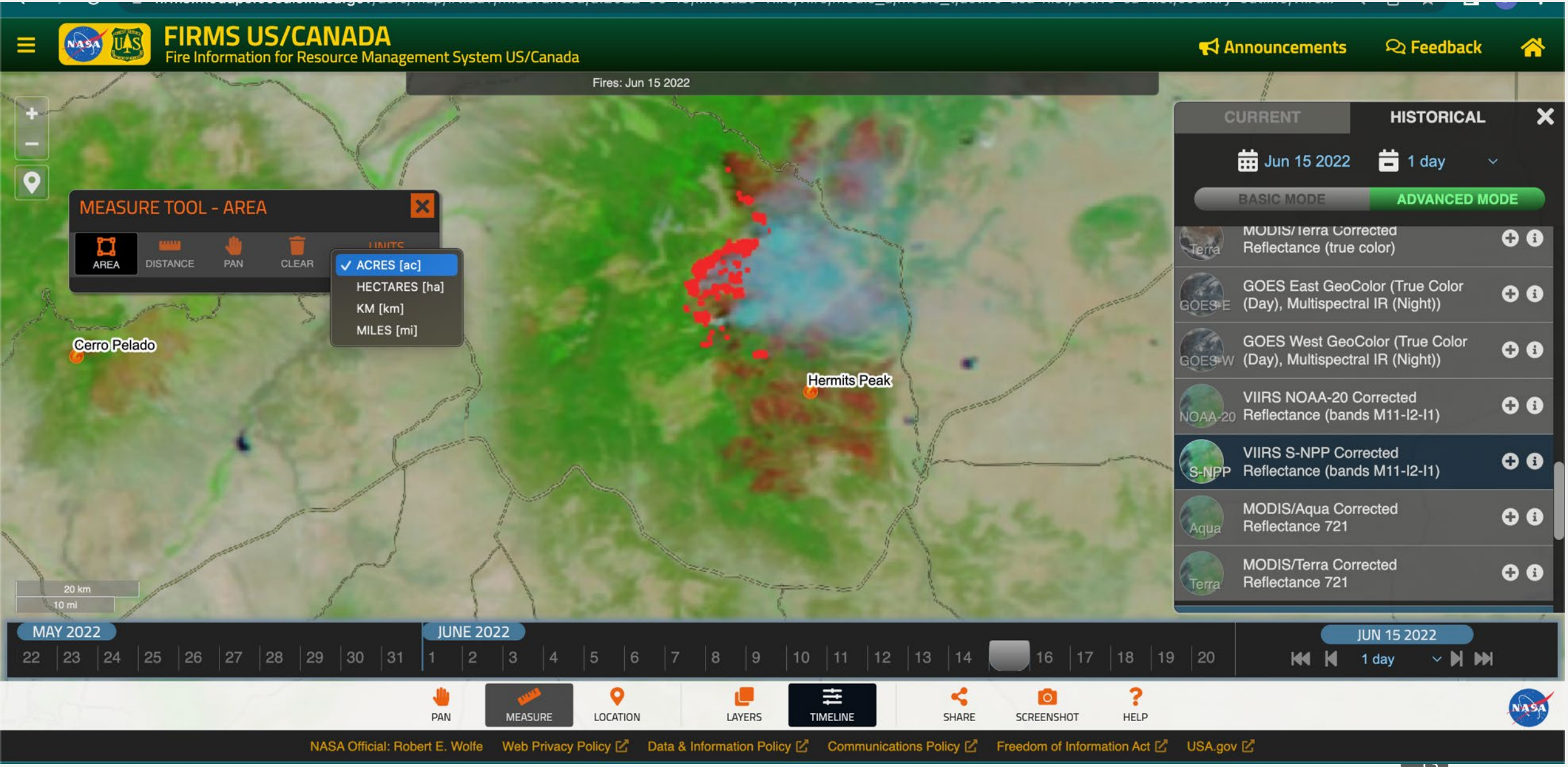
FIRMS: BASIC AND ADVANCED MODE

FIRMS: BASIC AND ADVANCED MODE


FIRMS
Fire Information for Resource Management System
Announcements
Feedback
Fires: Aug 04 2021
CURRENT
HISTORICAL
Aug 04 2021
1 day
BASIC MODE
ADVANCED MODE
Additional info at US/Canada map
Overlays
Latitude-Longitude Lines
Coastlines / Borders / Roads - BASIC
Coastlines / Borders / Roads - DETAILED
OMPS Aerosol Index PyroCumuloNimbus
OMPS Aerosol Index
1.000
≥ 5.0
Human Built-up And Settlement Extent
Protected Areas
The OMPS Aerosol index (AI) detects and measures the density of smoke and suspended particles in the vertical air column of the atmosphere. This can be useful for monitoring how smoke is transported
500 km
200 mi
JULY 2021
AUGUST 2021
AUG 04 2021
1 day
PAN
MEASURE
LOCATION
LAYERS
TIMELINE
SHARE
SCREENSHOT
HELP
NASA Official: Robert E. Wolfe
Web Privacy Policy
Data & Information Policy
Communications Policy
Freedom of Information Act
USA.gov

Time Since Detection, Location Tool and Timeline

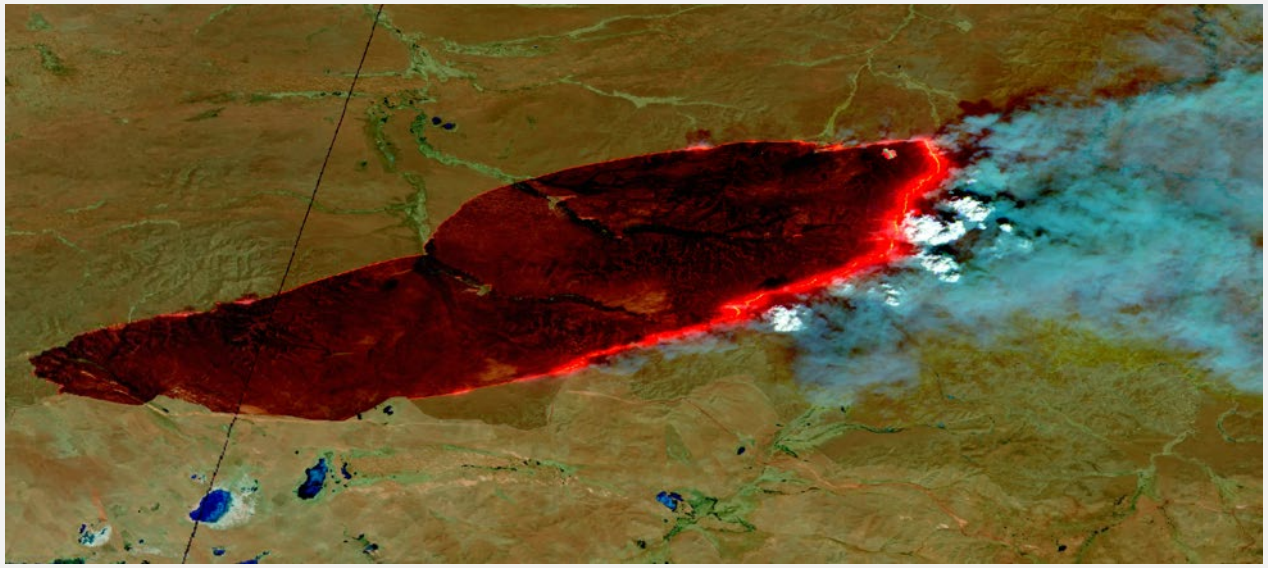
Measure Tool – Area and Distance



PROTOTYPE HARMONIZED LANDSAT AND SENTINEL 2 (HLS) FALSE COLOR COMPOSITE IMAGERY FOR LANCE FIRMS

- Available from March 15, 2022 – present on both US/Canada and Global FIRMS
- Dynamically generated imagery using COGs hosted in LP DAAC S3 bucket
  - Slower response times than pre-generated imagery as in GIBS

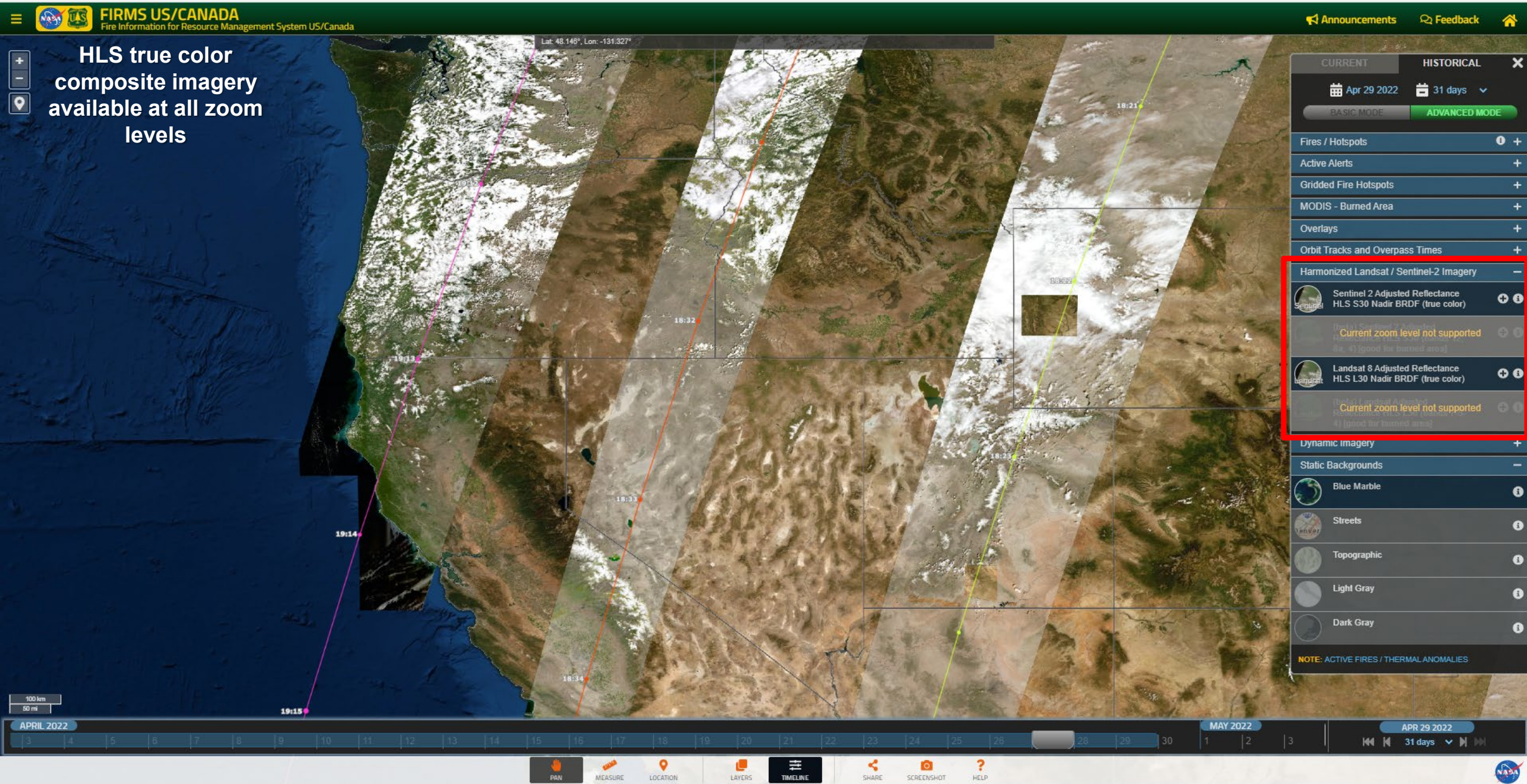
Satellite	L30	S30
FCC Band 1	7	12
FCC Band 2	5	8A
FCC Band 3	4	4



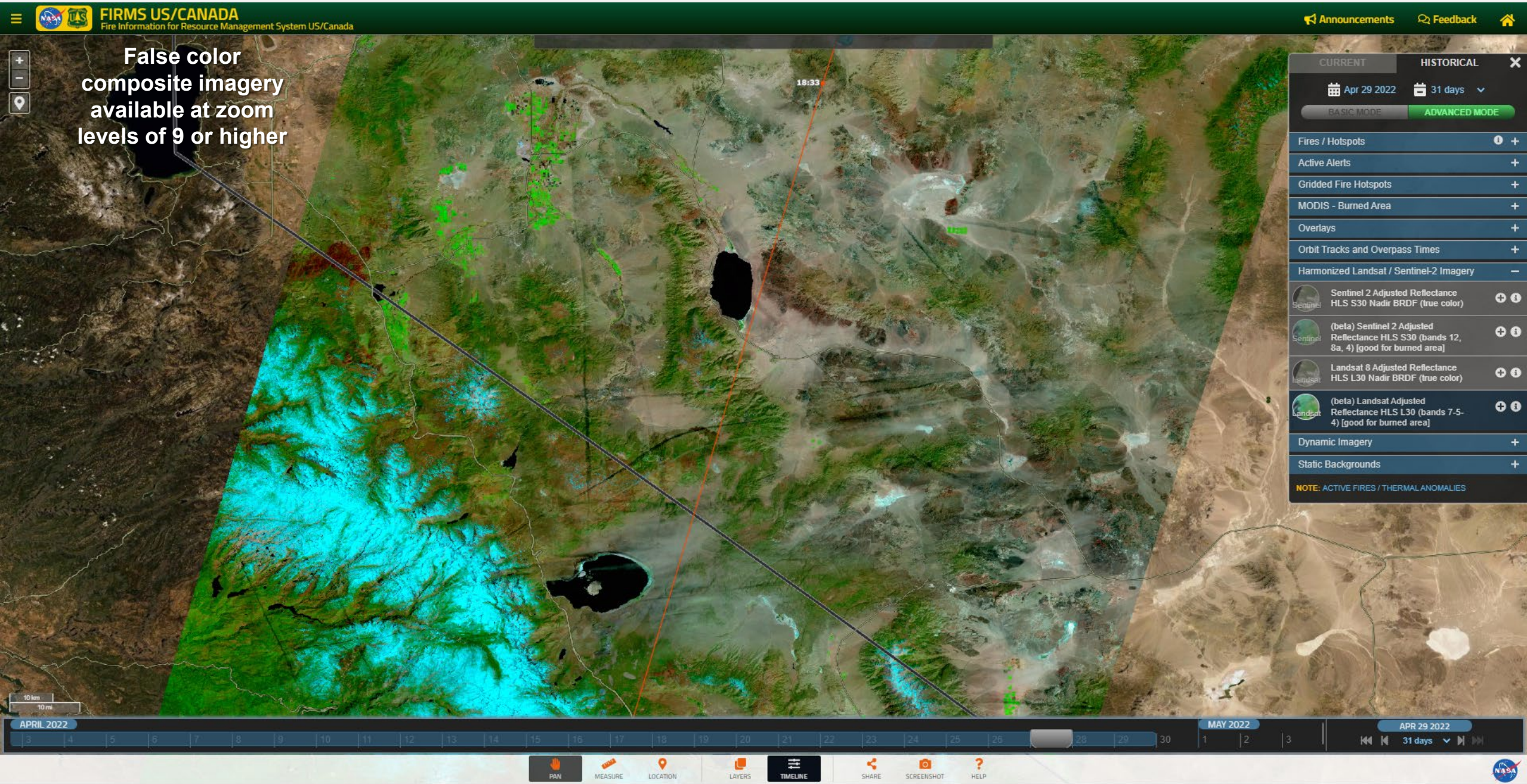
Slide courtesy of Brian Freitag (NASA MSFC / IMPACT). Presented at the LANCE UWG May 2022

IMPACT
Interagency Implementation and Advanced Concepts Team

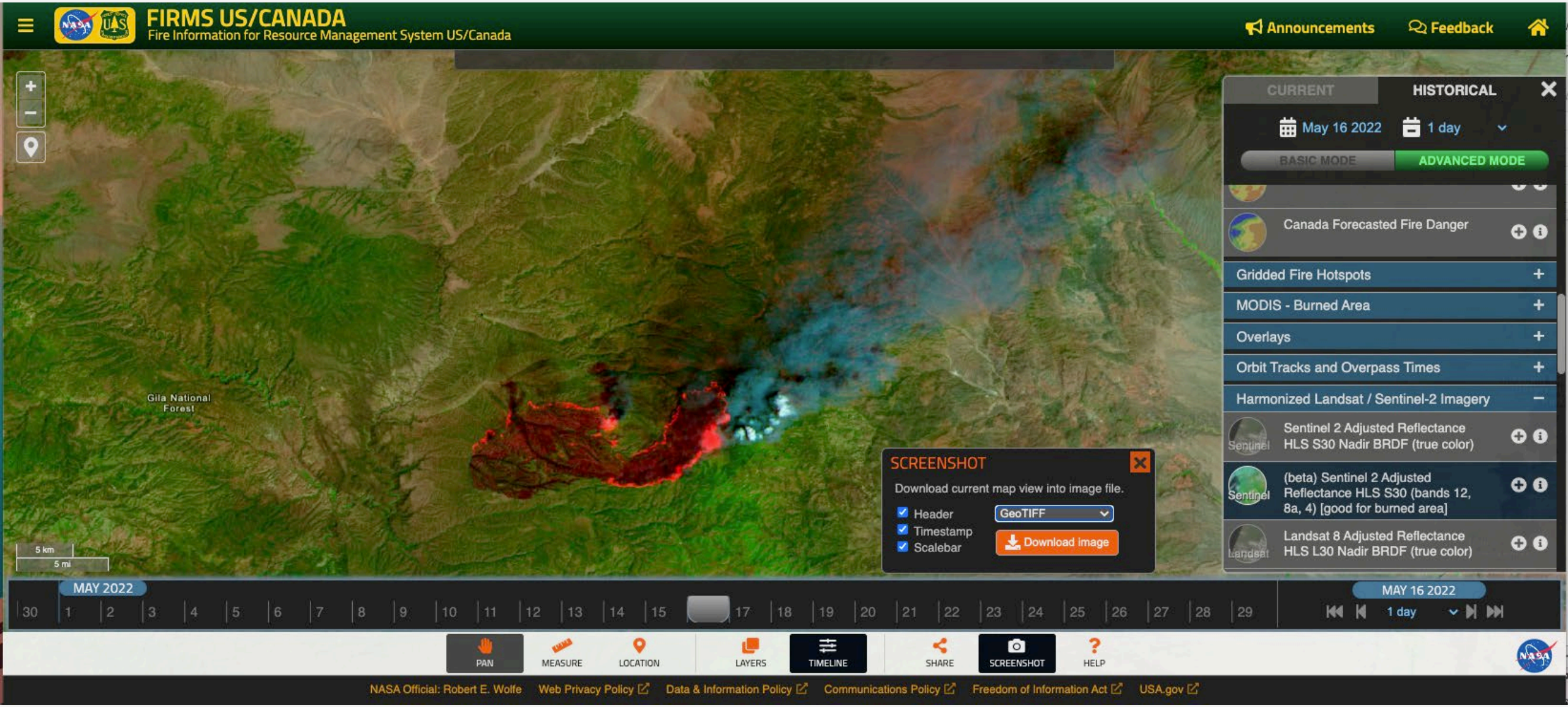
FIRMS HLS TRUE COLOR/FALSE COLOR COMPOSITE ACCESS



FIRMS HLS TRUE COLOR/FALSE COLOR COMPOSITE ACCESS

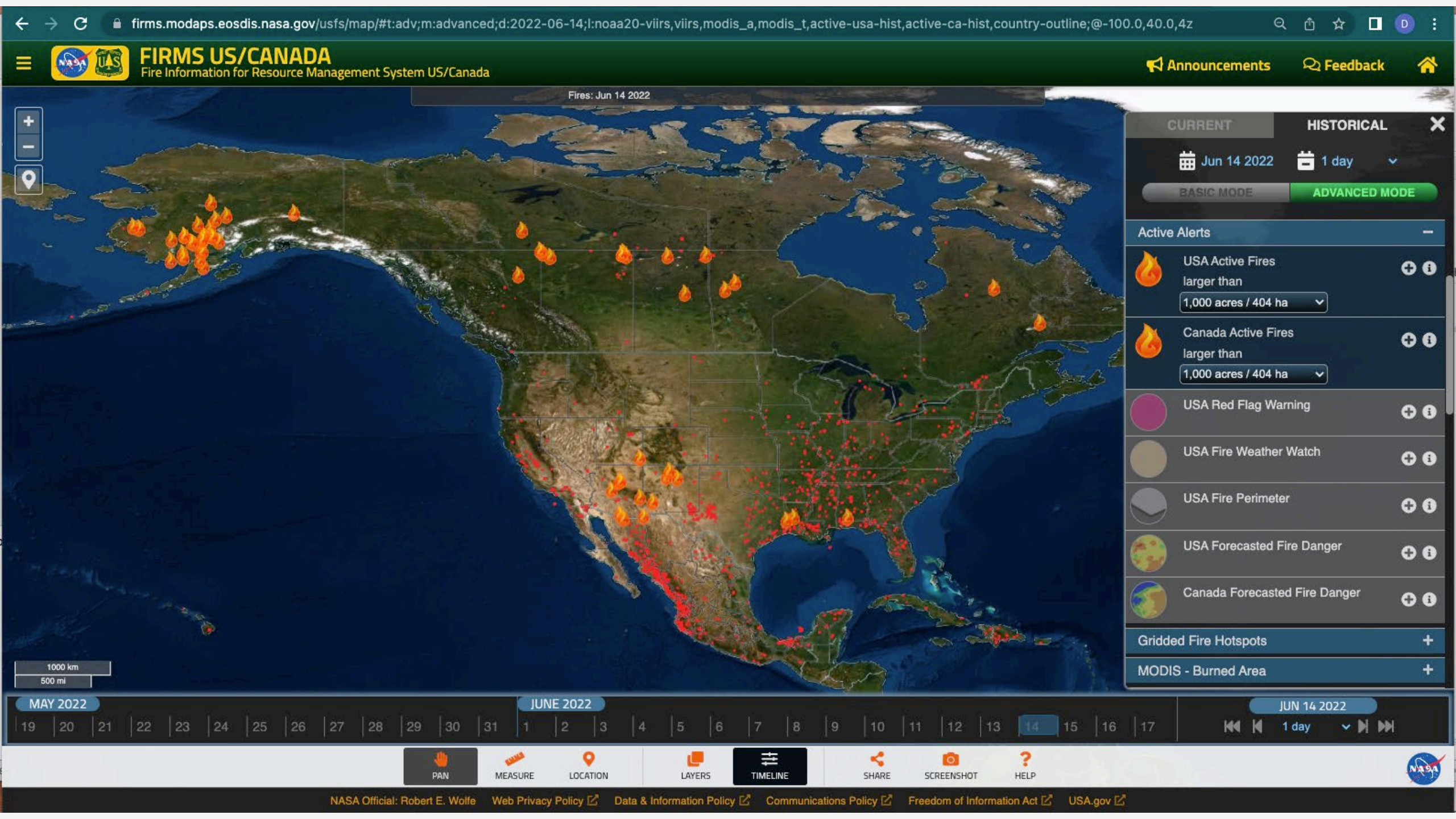


Hermit's Peak Fire, New Mexico



Black fire - HLS (beta) Sentinel 2 Adjusted Reflectance HLS S30 (bands 12, 8a, 4).
Shows active fire front and burned area on 16 May

FIRMS US/CANADA


firms.modaps.eosdis.nasa.gov/usfs/map/#t:adv;m:advanced;d:2022-06-14;l:noaa20-viirs,viirs,modis_a,modis_t,active-usa-hist,active-ca-hist,country-outline;@-100.0,40.0,4z
FIRMS US/CANADA
Fire Information for Resource Management System US/Canada
Announcements
Feedback
Fires: Jun 14 2022
CURRENT
HISTORICAL
Jun 14 2022
1 day
BASIC MODE
ADVANCED MODE
Active Alerts
USA Active Fires
larger than
1,000 acres / 404 ha
Canada Active Fires
larger than
1,000 acres / 404 ha
USA Red Flag Warning
USA Fire Weather Watch
USA Fire Perimeter
USA Forecasted Fire Danger
Canada Forecasted Fire Danger
Gridded Fire Hotspots
MODIS - Burned Area
1000 km
500 mi
MAY 2022
19 20 21 22 23 24 25 26 27 28 29 30 31
JUNE 2022
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
JUN 14 2022
1 day
PAN
MEASURE
LOCATION
LAYERS
TIMELINE
SHARE
SCREENSHOT
HELP
NASA Official: Robert E. Wolfe
Web Privacy Policy
Data & Information Policy
Communications Policy
Freedom of Information Act
USA.gov

Current incidents mapped on FIRMS US/Canada include links to national incident situation reports from trusted sources in the United States and Canada:

- National Interagency Coordination Center (NICC) (United States)
- Canadian Interagency Forest Fire Center (CIFFC) (Canada)

These reports provide valuable information about National Preparedness Levels, fire activity, and information about resources assigned to individual fires.

River Complex (3 fires), Klamath NF, USFS. NIMO (Team 3) and IMT 2 (CA Team 15). Nine miles southwest of Etna, CA. Timber and brush. Active fire behavior with backing, group torching and short-range spotting. Several communities, numerous structures and infrastructure threatened. Evacuations, area, road and trail closures in effect.

McCash, Six Rivers NF, USFS. IMT 2 (SW Team 3). Fourteen miles northeast of Somes Bar, CA. Timber, brush and tall grass. Extreme fire behavior with uphill runs, running and long-range spotting. Several communities and communication infrastructure threatened. Evacuations, area, road and trail closures in effect.

Lava, Shasta-Trinity NF, USFS. Four miles east of Weed, CA. Timber and brush. Minimal fire behavior with creeping and smoldering. Area and road closures in effect.

Incident Name	Unit	Size		%	Ctn/ Comp	Est	Personnel		Resources			Strc Lost	$$ CTD	Origin Own
		Acres	Chge				Total	Chge	Crw	Eng	Heli			
Dixie	CA-BTU	662,647	35,896	35	Ctn	9/30	5,982	-59	71	503	20	1,217	285M	ST
Monument	CA-SHF	128,613	9,249	10	Ctn	9/1	889	-31	12	85	9	32	21.7M	FS
Caldor	CA-ENF	62,586	39,667	0	Ctn	8/31	601	359	11	58	0	0	2.8M	FS
McFarland	CA-SHF	111,016	12,609	51	Ctn	9/2	631	179	16	57	7	2	23.3M	FS
Antelope	CA-KNF	60,634	2,970	27	Ctn	9/30	828	8	14	39	1	11	17.8M	FS
River Complex	CA-KNF	53,071	4,857	10	Ctn	10/1	806	54	14	40	9	0	14.6M	FS
McCash	CA-SRF	6,788	3,555	0	Ctn	9/29	338	36	4	5	2	0	5.3M	FS
Lava	CA-SHF	26,409	0	85	Ctn	9/1	5	0	0	1	0	23	35.3M	FS

Northwest Area (PL 5)

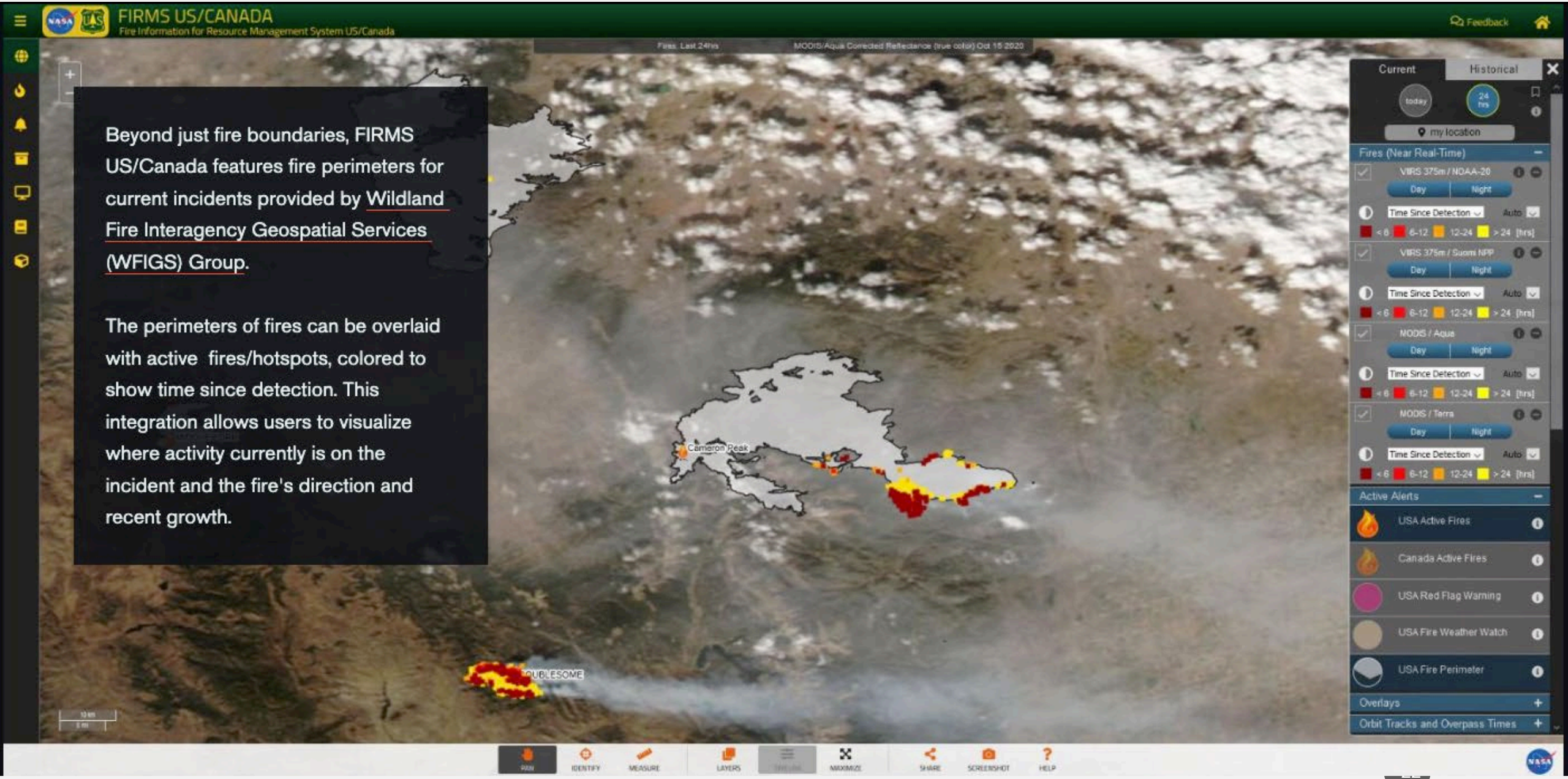
New fires:	7
New large incidents:	0
Uncontained large fires:	39
Type 1 IMTs committed:	7
Type 2 IMTs committed:	9

Ford Corkscrew, Northeast Region, DNR. IMT 2 (SW Team 5). Eleven miles south of Springdale, WA. Timber and brush. Active fire behavior with uphill runs, isolated torching and spotting. Several communities and structures threatened. Evacuations and road closures in effect.

Schneider Springs, Okanogan-Wenatchee NF, USFS. IMT 2 (EA Silver Team). IMT 1 (PNW Team 2) mobilizing. IMT is also managing the Windy Pass incident. Twenty-one miles northwest of Tieton, WA. Short grass, timber and brush. Extreme fire behavior with uphill runs, running and flanking. Several communities and numerous structures threatened. Evacuations, area, road and trail closures in effect.

Windy Pass, Okanogan-Wenatchee NF, USFS. Eleven miles southwest of Cle Elum, WA. Timber and short grass. Minimal fire behavior. Structures threatened. Area, road and trail closures in effect.

Walker Creek, Northeast Region, DNR. IMT 2 (NR Team 6). IMT is also managing the Chickadee Creek incident. Four miles northwest of Wauconda, WA. Timber and short grass. Active fire behavior with single tree torching, short-range spotting and flanking. Several communities and numerous structures threatened. Evacuations, area, road and trail closures in effect.

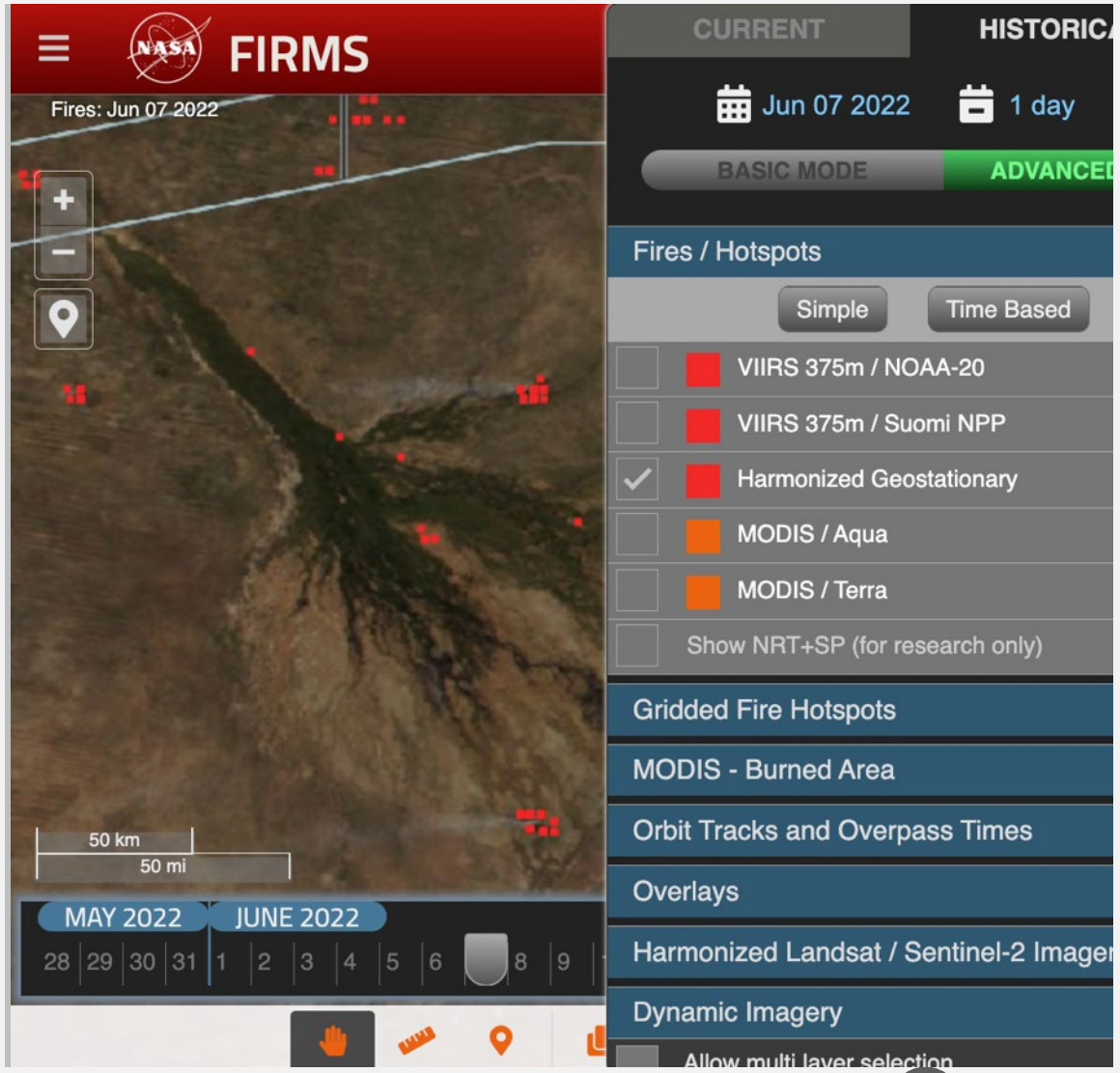

FIRMS US/CANADA
Fire Information for Resource Management System US/Canada
Feedback
Fires, Last 24hrs
MODIS/Aqua Corrected Reflectance (true color) Oct 15 2020
Beyond just fire boundaries, FIRMS US/Canada features fire perimeters for current incidents provided by Wildland Fire Interagency Geospatial Services (WFIGS) Group.
The perimeters of fires can be overlaid with active fires/hotspots, colored to show time since detection. This integration allows users to visualize where activity currently is on the incident and the fire's direction and recent growth.
Cameron Peak
Current
Historical
today
24 hrs
my location
Fires (Near Real-Time)
VIIRS 375m / NOAA-20
Day
Night
Time Since Detection
Auto
< 6
6-12
12-24
> 24
[hrs]
VIIRS 375m / Suomi NPP
MODIS / Aqua
MODIS / Terra
Active Alerts
USA Active Fires
Canada Active Fires
USA Red Flag Warning
USA Fire Weather Watch
USA Fire Perimeter
Overlays
Orbit Tracks and Overpass Times
PAN
IDENTIFY
MEASURE
LAYERS
MAXIMIZE
SHARE
SCREENSHOT
HELP

FIRMS showing Interagency fire management boundaries of the US National Geographic Area Coordination Centers (GACC).

NEXT STEPS

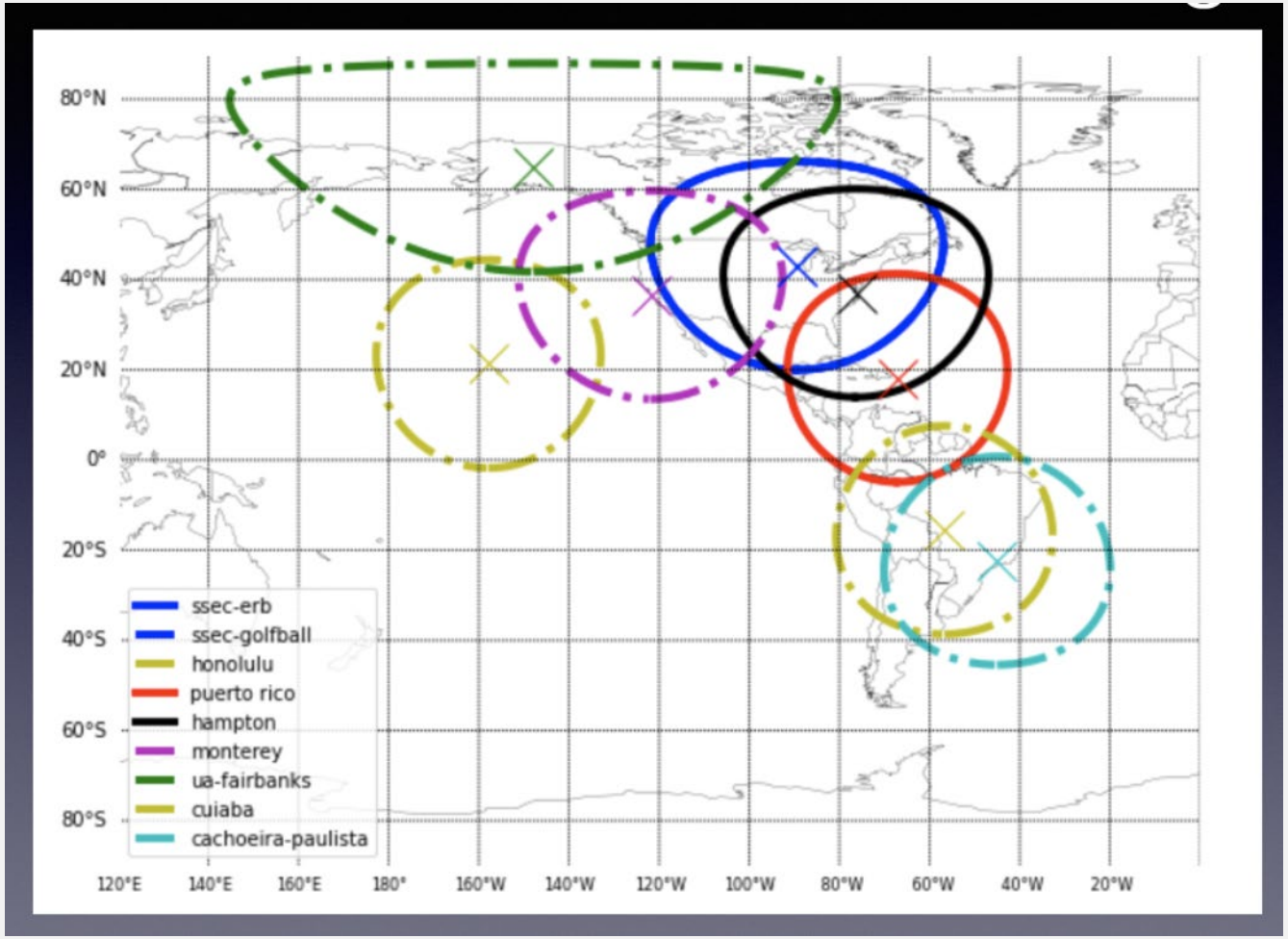
FIRMS Global
Geostationary active fire data
- Himawari, Meteosat - FRP Algorithm
-GOES 16 & 17 FDC NOAA Algorithm

FIRMS US/Canada
RT MODIS and VIIRS
Landsat Active Fire



Ultra Low Latency Detection of Active Fires using VIIRS and MODIS

Current and Planned Coverage of Real-Time Data



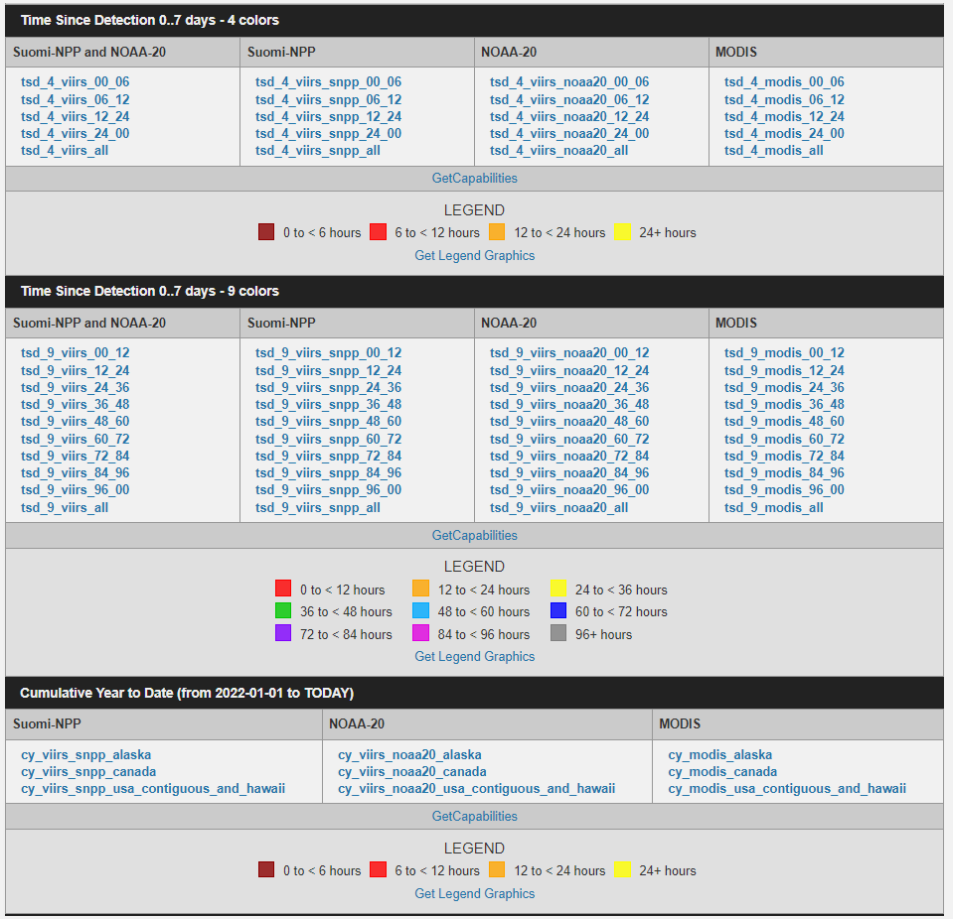
Current Status

- Ultra low latency data are received from Madison (x 2 antennas), Hampton, and Mayaguez.
- Standard low latency data are received from Honolulu and Monterey (after the pass is complete).
- MODIS data are processed via OCSSW and MOD14; VIIRS data are processed via VIIRS L1 and VFIRE375.
- Fire locations are converted to CSV and are provided to LANCE/FIRMS via Web API.
- MODIS latency is ~ 25 seconds; VIIRS is ~ 50 seconds for data ingested and processed in real time.
- Have tested VIIRS data ingest from two antennas in Brazil; have requested VIIRS data from Univ. of Alaska Fairbanks.

Information from presentation made by Liam Gumley (SSEC UWM) at the LANCE UWG, May 2022

MAP SERVICES

- OGC compliant WMS, WMS-T and WFS services
- Optimized to meet decision support application needs
- Updated every 15 minutes
- Active fire detection services
  -- Time since detection services
  -- Cumulative year to date services
- Esri AGOL feature services:
  -- Active fire feature services with NASA as authoritative source
- Burned area services
  --Monthly MODIS burned Burn scar services



Time Since Detection 0..7 days - 4 colors

Suomi-NPP and NOAA-20	Suomi-NPP	NOAA-20	MODIS
tsd_4_viirs_00_06	tsd_4_viirs_snpp_00_06	tsd_4_viirs_noaa20_00_06	tsd_4_modis_00_06
tsd_4_viirs_06_12	tsd_4_viirs_snpp_06_12	tsd_4_viirs_noaa20_06_12	tsd_4_modis_06_12
tsd_4_viirs_12_24	tsd_4_viirs_snpp_12_24	tsd_4_viirs_noaa20_12_24	tsd_4_modis_12_24
tsd_4_viirs_24_00	tsd_4_viirs_snpp_24_00	tsd_4_viirs_noaa20_24_00	tsd_4_modis_24_00
tsd_4_viirs_all	tsd_4_viirs_snpp_all	tsd_4_viirs_noaa20_all	tsd_4_modis_all

GetCapabilities

LEGEND

0 to < 6 hours | 6 to < 12 hours | 12 to < 24 hours | 24+ hours

Get Legend Graphics

Time Since Detection 0..7 days - 9 colors

Suomi-NPP and NOAA-20	Suomi-NPP	NOAA-20	MODIS
tsd_9_viirs_00_12	tsd_9_viirs_snpp_00_12	tsd_9_viirs_noaa20_00_12	tsd_9_modis_00_12
tsd_9_viirs_12_24	tsd_9_viirs_snpp_12_24	tsd_9_viirs_noaa20_12_24	tsd_9_modis_12_24
tsd_9_viirs_24_36	tsd_9_viirs_snpp_24_36	tsd_9_viirs_noaa20_24_36	tsd_9_modis_24_36
tsd_9_viirs_36_48	tsd_9_viirs_snpp_36_48	tsd_9_viirs_noaa20_36_48	tsd_9_modis_36_48
tsd_9_viirs_48_60	tsd_9_viirs_snpp_48_60	tsd_9_viirs_noaa20_48_60	tsd_9_modis_48_60
tsd_9_viirs_60_72	tsd_9_viirs_snpp_60_72	tsd_9_viirs_noaa20_60_72	tsd_9_modis_60_72
tsd_9_viirs_72_84	tsd_9_viirs_snpp_72_84	tsd_9_viirs_noaa20_72_84	tsd_9_modis_72_84
tsd_9_viirs_84_96	tsd_9_viirs_snpp_84_96	tsd_9_viirs_noaa20_84_96	tsd_9_modis_84_96
tsd_9_viirs_96_00	tsd_9_viirs_snpp_96_00	tsd_9_viirs_noaa20_96_00	tsd_9_modis_96_00
tsd_9_viirs_all	tsd_9_viirs_snpp_all	tsd_9_viirs_noaa20_all	tsd_9_modis_all

GetCapabilities

LEGEND

0 to < 12 hours | 12 to < 24 hours | 24 to < 36 hours
36 to < 48 hours | 48 to < 60 hours | 60 to < 72 hours
72 to < 84 hours | 84 to < 96 hours | 96+ hours

Get Legend Graphics

Cumulative Year to Date (from 2022-01-01 to TODAY)

Suomi-NPP	NOAA-20	MODIS
cy_viirs_snpp_alaska	cy_viirs_noaa20_alaska	cy_modis_alaska
cy_viirs_snpp_canada	cy_viirs_noaa20_canada	cy_modis_canada
cy_viirs_snpp_usa_contiguous_and_hawaii	cy_viirs_noaa20_usa_contiguous_and_hawaii	cy_modis_usa_contiguous_and_hawaii

GetCapabilities

LEGEND

0 to < 6 hours | 6 to < 12 hours | 12 to < 24 hours | 24+ hours

Get Legend Graphics

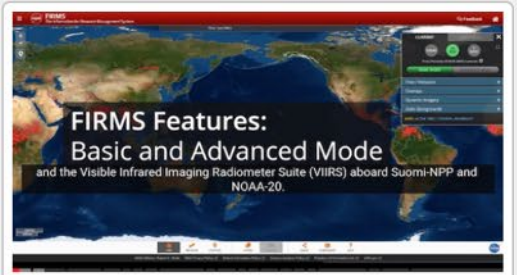
firms.modaps.eosdis.nasa.gov/resources/

FIRMS
Fire Information for Resource Management System

Announcements Feedback

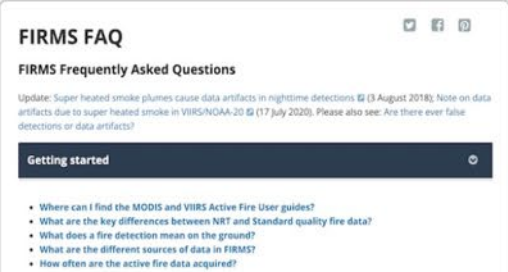
Additional Resources

FIRMS Blog
Tips, Suggestions and What's new.

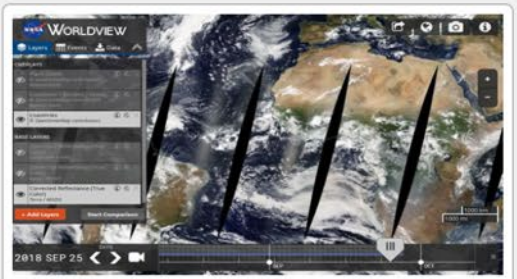


YouTube Tutorial
How to use NASA's FIRMS.

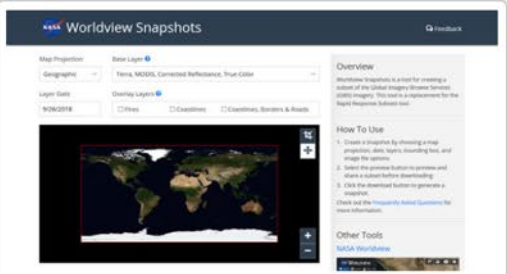
FIRMS Story Map
Managing Wildfires with Satellite Data.



FIRMS FAQ
Frequently Asked Questions.



Worldview
Explore satellite imagery.



Worldview Snapshots
Creating image subsets and snapshots.

https://firms.modaps.eosdis.nasa.gov/resources/

NASA Earth Science Data Resources for Wildfires

FIRMS

NASA's Fire Information for Resource Management System (FIRMS) enables access to global near real-time (NRT) satellite imagery, active fire detections and other data from multiple satellites. FIRMS combines value-added data products to provide critical information to wildfire management organizations and impacted individuals. FIRMS distributes active fire data in multiple GIS formats, as web services and as automated detection alerts.

Access FIRMS: https://earthdata.nasa.gov/firms

FIRMS US/Canada

FIRMS US/Canada combines FIRMS capabilities, value-added and regionally specific data products for North America as well as ongoing efforts by NASA and the USDA Forest Service to integrate new technologies and data enhancements. NRT satellite data with real-time availability for selected data sources will be available in summer 2022.

Access FIRMS US/Canada: https://firms.modaps.eosdis.nasa.gov/usfs/

FIRMS Tutorial

This tutorial provides an introduction to the basic and advanced features of NASA's FIRMS. We show how to view satellite observations of active fires and hotspots on an interactive map; navigate between the basic and advanced modes; learn what a satellite-derived fire detection means on the ground and demonstrate how to add data imagery layers to be able to view fires and smoke plumes.

View tutorial: https://youtu.be/SSd7KnWN9CM

Pathfinders and Toolkits

Data Pathfinders are designed to help users select and learn how to use data products by providing links to commonly used datasets across NASA's Earth science data collections. Toolkits, which are organized by topic and provide access to datasets, articles, and other useful information, show users different ways to visualize and subset NASA data, and provide options for saving data in different file formats.

https://earthdata.nasa.gov/pathfinders

https://earthdata.nasa.gov/toolkits

Blog, Tutorials, and FAQ

Do you have questions about how to use FIRMS or FIRMS US/Canada? Interested in learning what new capabilities are available? You can find all of this information, and learn more about the active fire detections and data products at: **https://firms.modaps.eosdis.nasa.gov/usfs/resources/**

Applied Sciences Wildfires Program

The Applied Sciences Wildfires program area leverages Earth-observing data, applied research and partnerships to reduce wildfire risk before, during, and after an event.

Learn more: https://appliedsciences.nasa.gov/what-we-do/wildfires

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https://forum.earthdata.nasa.gov

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https://www.facebook.com/NASAEarthdata

National Aeronautics and Space Administration