Earth Fire Alliance

Keith J. Masback

June 2025

Earth Fire Alliance

A Global Nonprofit Coalition

Observe all of our planet's fires comprehensively. Serve end users worldwide with timely and trustworthy information. Conserve Earth's ecosystems, communities, and economies by informing mitigation, response, and resilience strategies.

FireSat

The Alliance's Flagship Program

A first-of-its-kind satellite purpose-built for the global wildfire challenge. FireSat will be unmatched by any combination of existing or planned satellites in terms of resolution and latency and will generate an unprecedented dataset poised to transform humanity's relationship with fire.

By the Numbers: The FireSat Constellation

50+
Satellites in full constellation

20 min
Average revisit with full constellation

6 channels
Multispectral imaging across 5 bands

80 m
Average resolution of fire monitoring

< 5%
False positive detection

99%
Coverage of Earth's wildfires

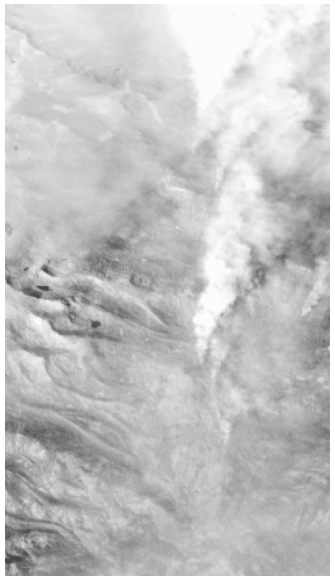
<2 Years
Timeline for Initial Operational Capability

2029
Year for expected Full Operational Capability

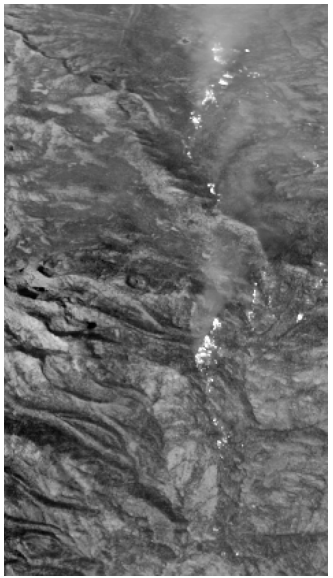
FireSat Observations

Multispectral imaging across 5 bands optimized to monitor fire intensity and early detection.

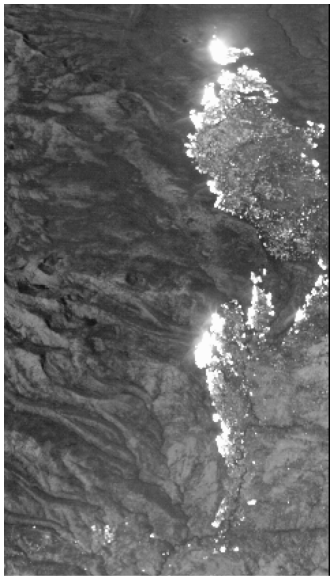
Visible



Near Infrared
(NIR)



Shortwave Infrared
(SWIR)



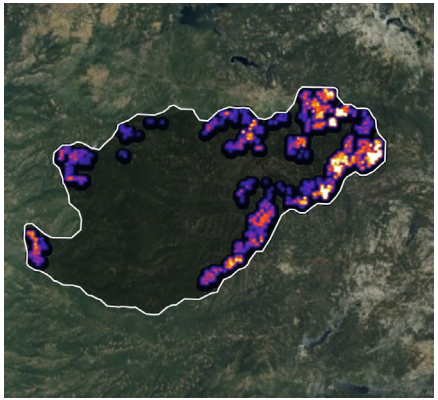
Midwave Infrared
(MWIR)

Longwave Infrared
(LWIR)

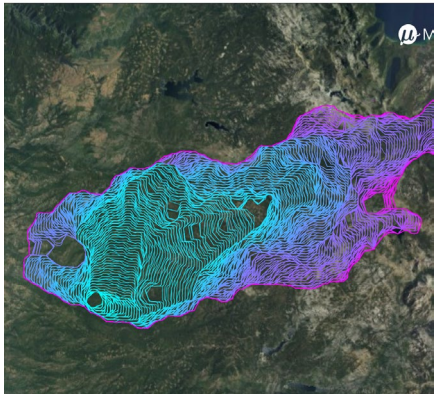
Images Courtesy of NASA MASTER Airborne Sensor and Muon Space

FireSat data products are designed for interoperability, empowering effective decisions in existing support systems.

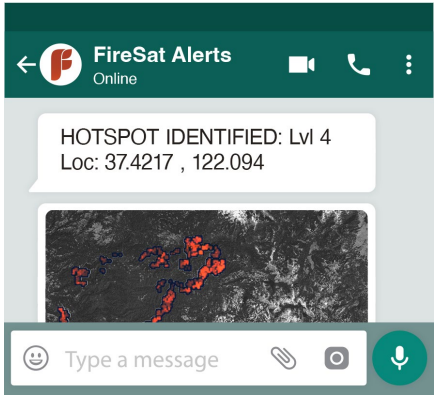
Fire Perimeter



Fire Radiative Power



Fire Progression



Hotspot Identification

Efficient resource allocation from a real-time common operating picture

New measures of climate and ecosystem impacts from fire radiative power (heat intensity)

Improved safety for the frontline and public with persistent situational awareness of wildfire

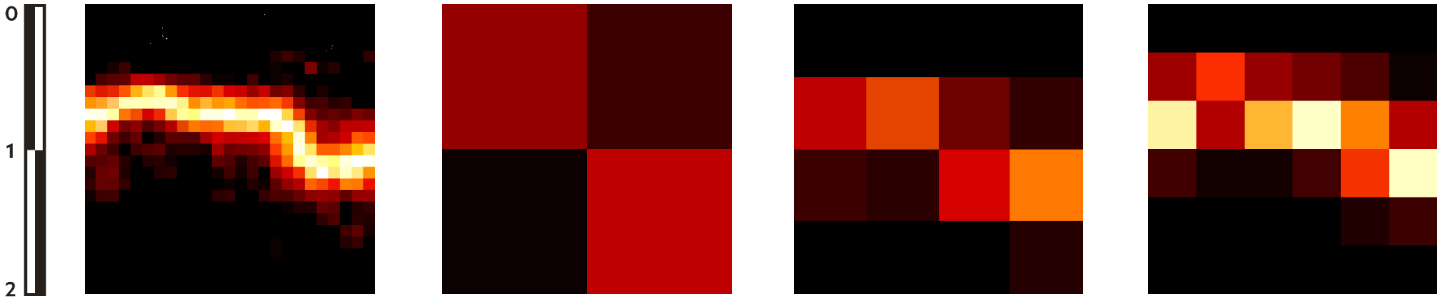
Early detection and assessment of new or growing wildfires during initial attack

Space-Based Fire Data Landscape

Space-Based Fire Monitoring Capabilities	FireSat	GOES-16	MODIS Terra/Aqua	VIIRS Suomi NPP
Spatial Resolution	80 Meter	1000 Meter	500 Meter	375 Meter
	5 Meter Hotspot Detection	No Subpixel Hotspot Detection	No Subpixel Hotspot Detection	No Subpixel Hotspot Detection
Temporal Resolution (Global Revisit)	2026 - IOC	2029 - FOC	*North America Only	Sunsetting 2025	
Time between images	**12 Hr**	**20 min**	5 min	24-48 Hour	12 Hour

Simulated data product images for an area of 4 square kilometers

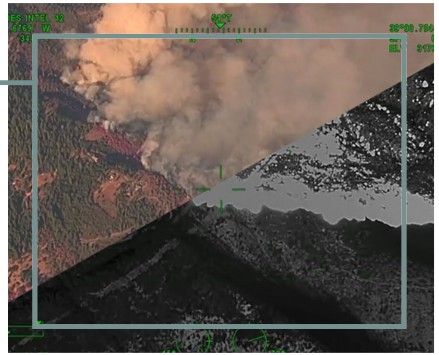
Spatial Resolution is the pixel size of images captured from space.



Part of the Remote Sensing Ecosystem

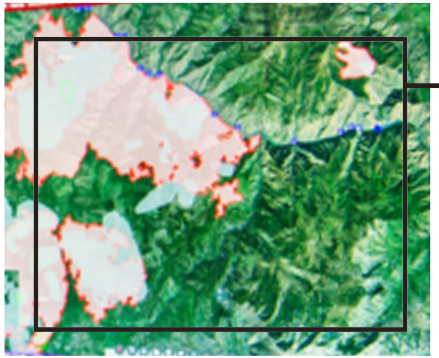
Aircraft Observations

Rapid intelligence and surveillance in visible and infrared during initial attack of major fire activity. Modeling of fire spread.



FireGuard

Detection and monitoring of wildfire activity from national assets. Heat mapping, persistent data products of fire location, shape, and directionality.



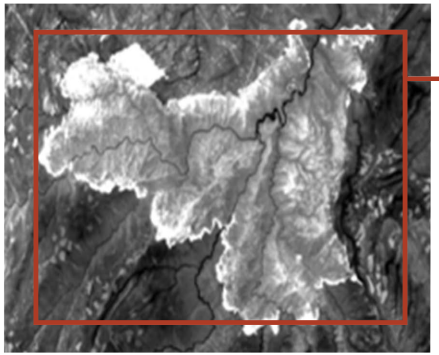
Ground Cameras

Live camera footage monitoring landscape for early detection of wildfire activity and situational awareness in remote areas.

Image Courtesy of AlertWildfire

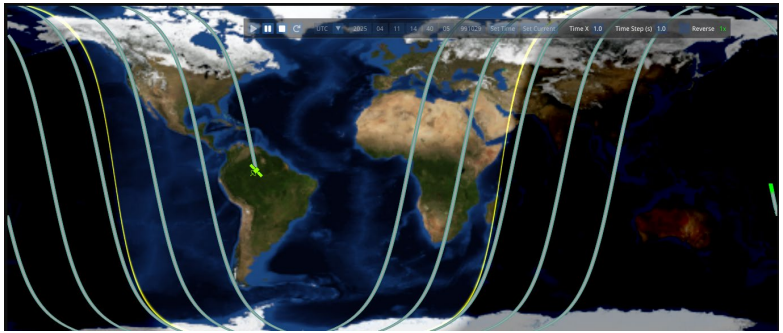
FireSat

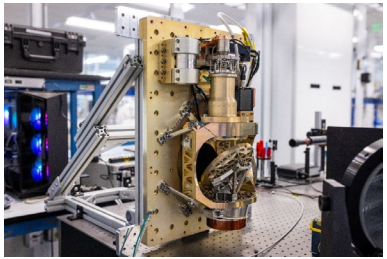
Satellites provide low-latency global coverage of fire detections and intensity maps across multiple spectral wavelengths.



Protoflight Accelerates Operational Adoption

- FireSat0 is fully functional and has comprehensive imaging capabilities, full resolution, and image collection across 5 spectral bands.
- Goals:
  - Testing and risk reduction
  - End-to-end demonstration of FireSat *Collect, Process, Distribute* pipeline
  - Gather feedback, understand integration, & test operational readiness





Launch
3/14/2025

FireSat Test & Checkout
Spring 2025

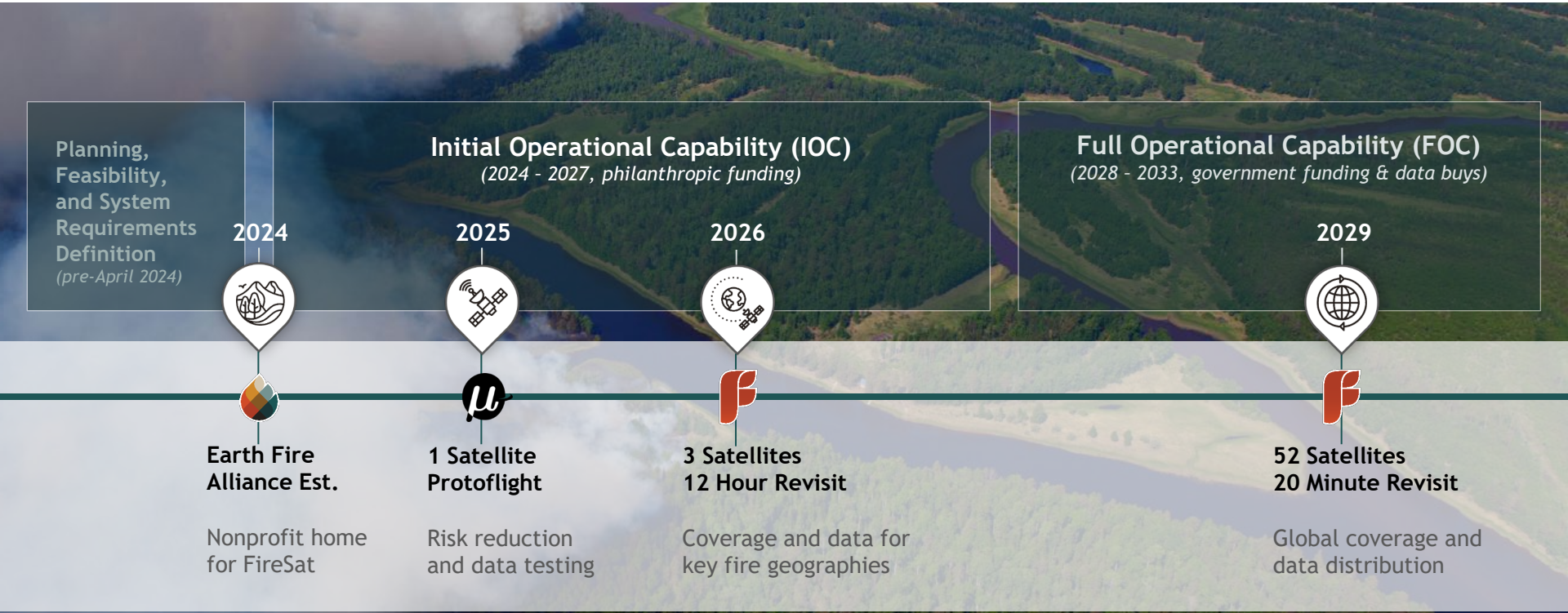
First Fire Imagery
Summer 2025

Data Packet Delivery
Q3/Q4 2025

Launch
Q2 2026

Operational Data
Late Q3 2026

Phased Deployment & Sustainment Path



Radical Collaboration

The Alliance is a broad network of interconnected stakeholders who are purpose-driven and mission-aligned:

End Users

Individuals and organizations who use Earth Fire Alliance's real-time data and data products

Technical Partners

Data, contractor, and engineering partners who build, operate, process, distribute, and integrate transformative fire data

Funders & Policy Partners

Agencies and organizations who support long-term sustainment

To ensure rapid benefit, we find ways to leverage the best of public sector, private sector, and non-governmental organizations (NGOs).

Leveraging this collaborative, community-led approach allows us to deliver on our mission to provide transformative real-time data for all wildfires on Earth to the global fire community as quickly, seamlessly, and efficiently as possible.

Earth Fire Alliance

Observe. Serve. Conserve.

hello@earthfirealliance.org