A Low-Latency, Multi-Sensor Framework For Global Wildfire Intelligence

20th May 2026

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Why wildfires are everyone’s problem.

Climate impact

More frequent, intense, and harder-to-control wildfires.

Economic impact

Devastating natural forests and destroying commercial assets.

Human cost

Endangering firefighters’ safety and community health.

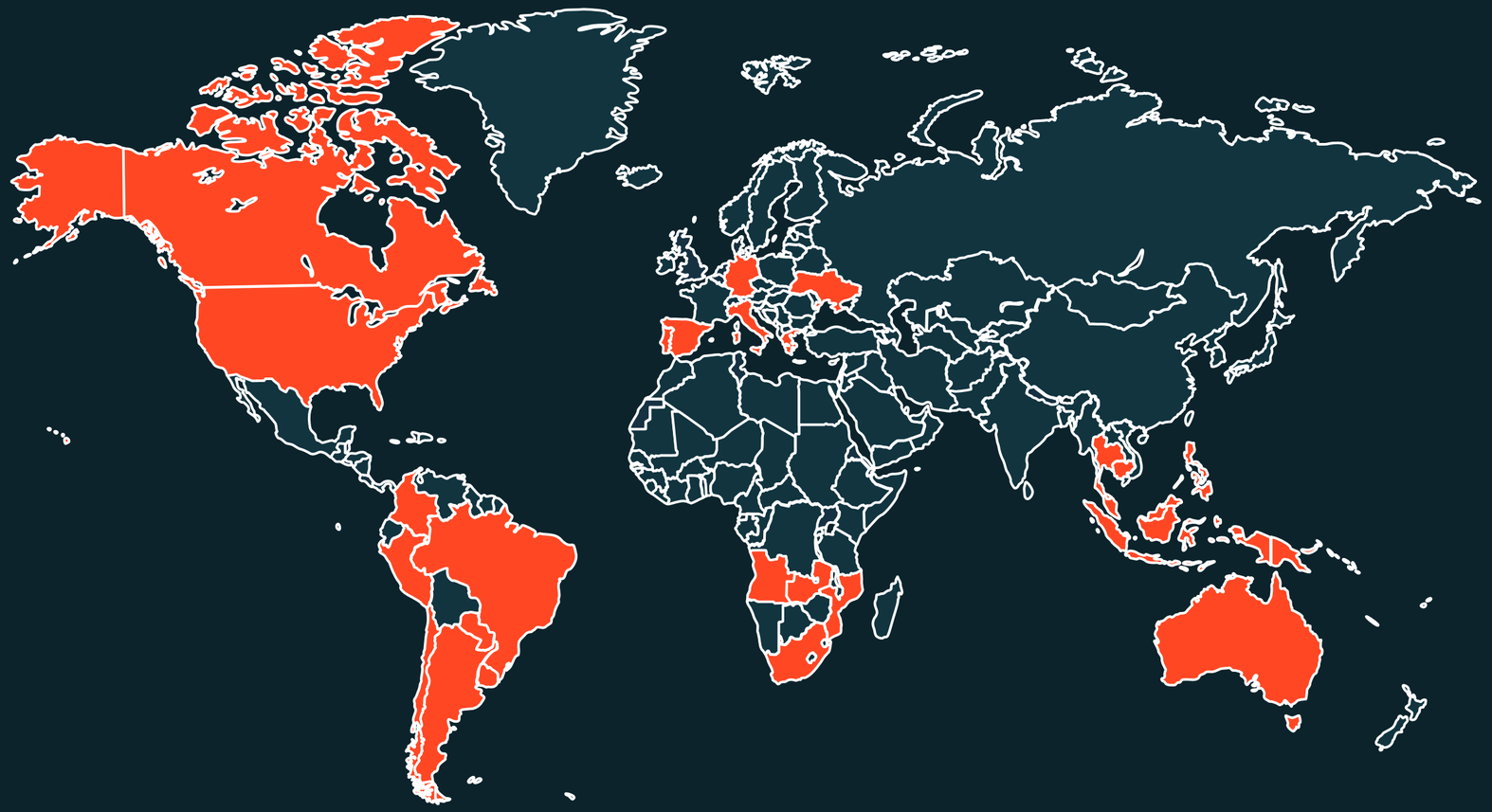
Limited resources

Straining response efforts, leading to delays and ineffective decision-making.

Global FIre-intelligence service

500+
users in
25 countries

500M
hectares of
protected area



35
satellite
sources

190+
employees on
5 continents

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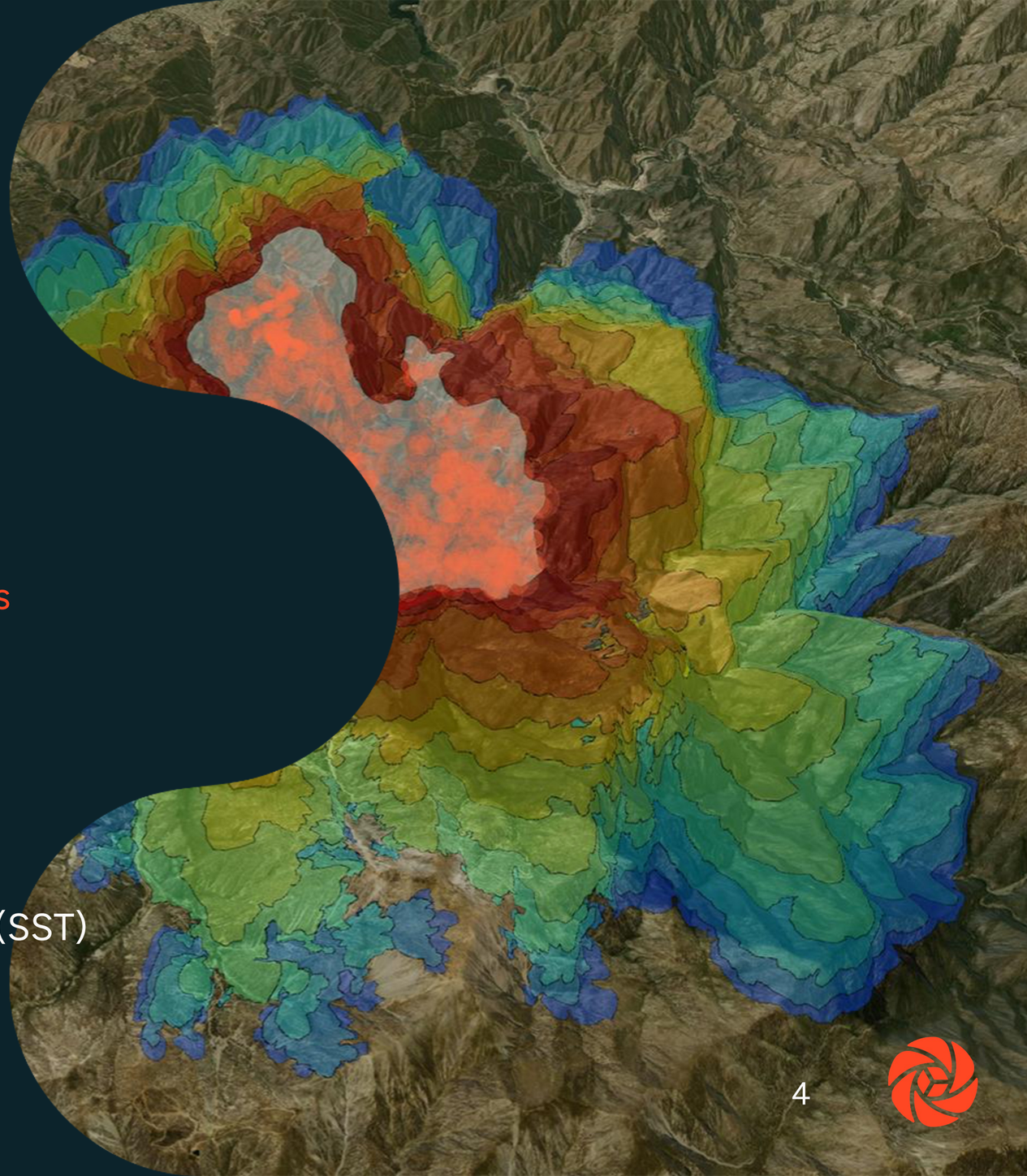
Hello, we are OroraTech

High-revisit fire detection

- Wildfire Solution
  - Combines fire detections from 35+ satellites
  - Currently monitoring 500 Mio. ha in 25 countries
- Need: global revisit every 30 minutes with low latency
- Specialized thermal imagers for rapid wildfire detections
- 18 payloads in orbit
- Satellite data products:
  - Level-1
  - NRT-Active Fire; soon: Fire Radiative Power (FRP)
  - Land Surface Temp. (LST); soon: Sea Surface Temp. (SST)



Wildfire management for every stage of the fire cycle

OroraTech's Wildfire Solution

Pre-Fire

Risk Assessment

- Short Term Fire Hazard
- Weather information
- Fire danger index and forecast
- Vegetation and terrain analysis

Active Fire

Early Detection

- 24/7 observation from 35+ satellites
- Automatic notifications via email, SMS, WhatsApp, etc.
- Accurate fire location and affected area

Near-real-time monitoring

- Continuous fire and intensity tracking
- Actionable incident overview
- Fire propagation modeling
- Suppression planning

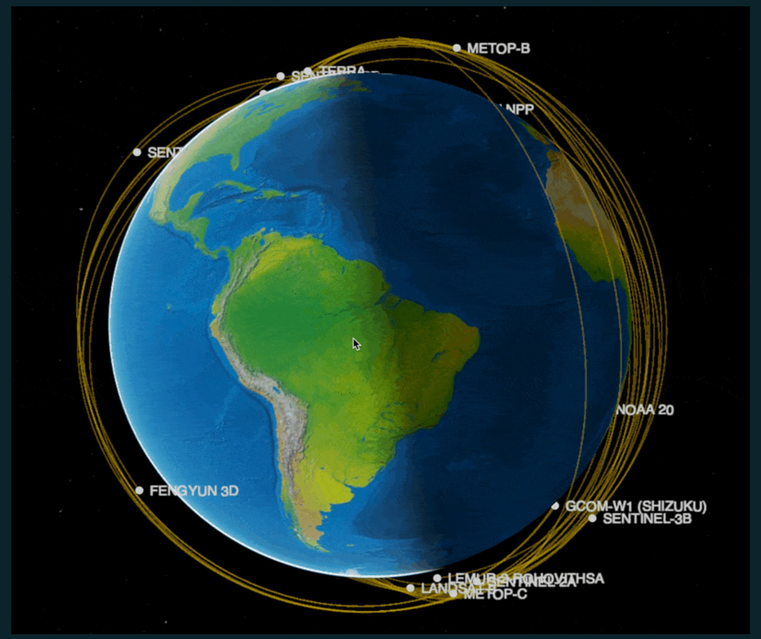
Post-Fire

Damage Analysis

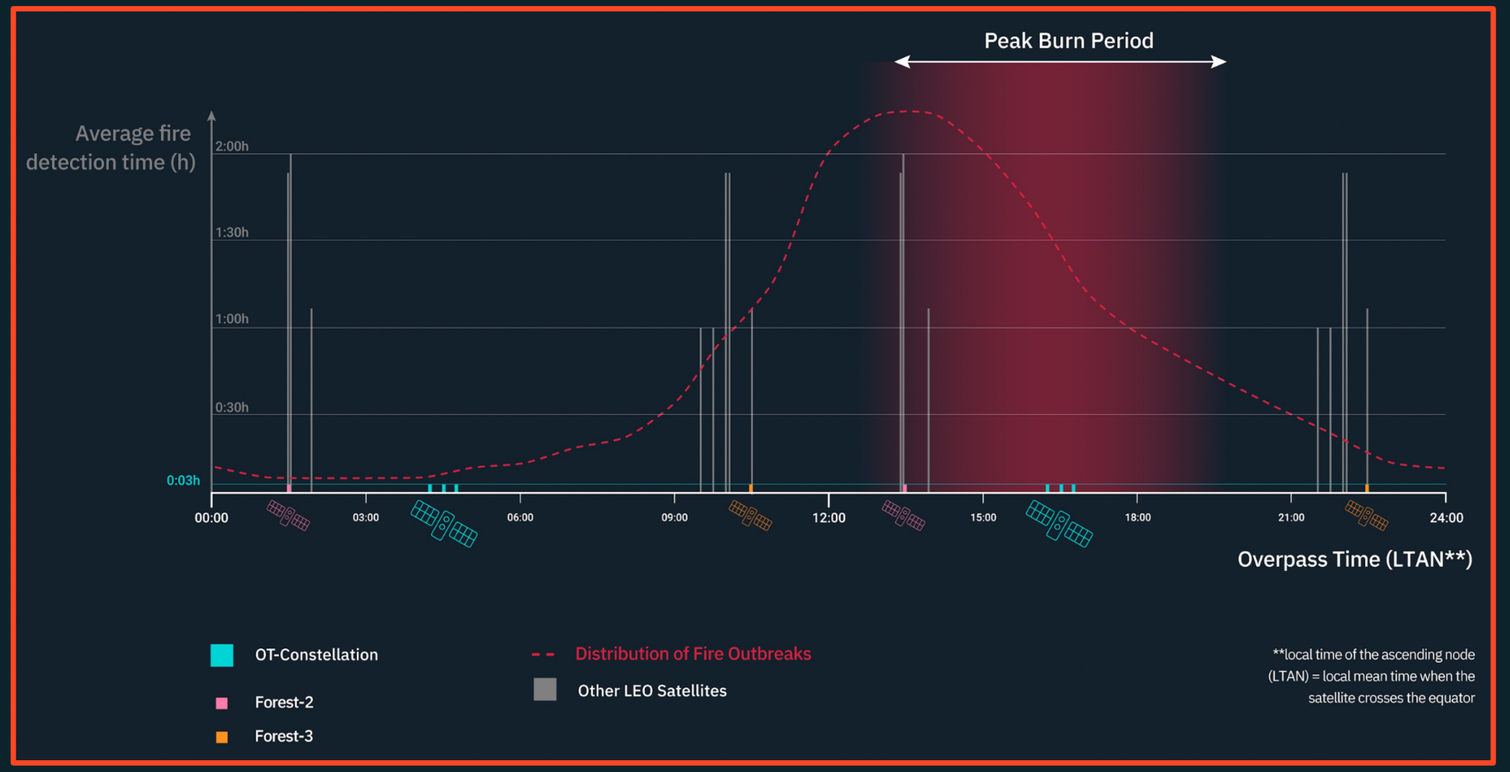
- Automatic high-resolution burnt area and severity map
- Long-term fire statistics & report
- Fire origin and evolution

Closing the observation gap

Deploying the world's first constellation for rapid wildfire detection & monitoring



Afternoon LEO observation gap



Peak burn period

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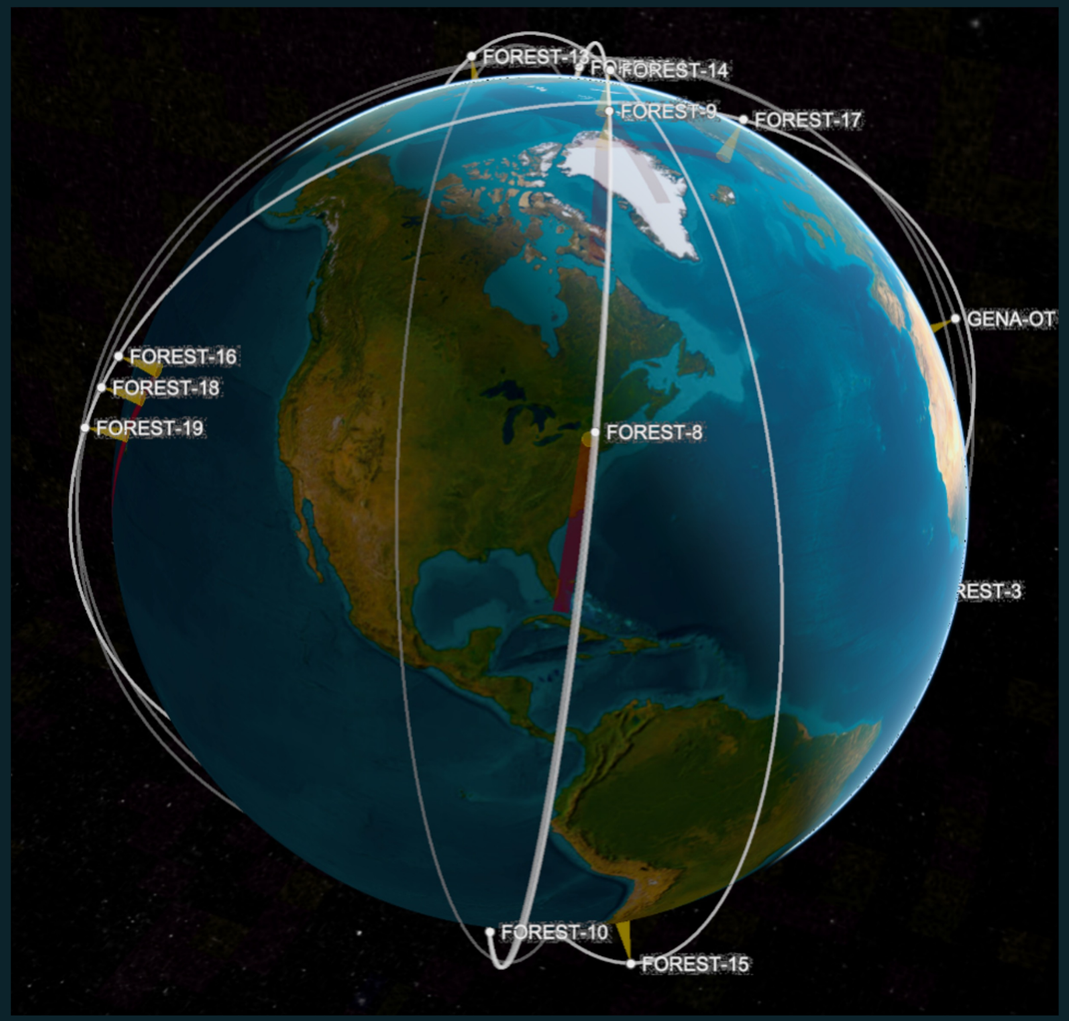
Closing the observation gap

Current state of satellite fleet (https://satvis.space/ot)



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Deployment Status

Since 2020

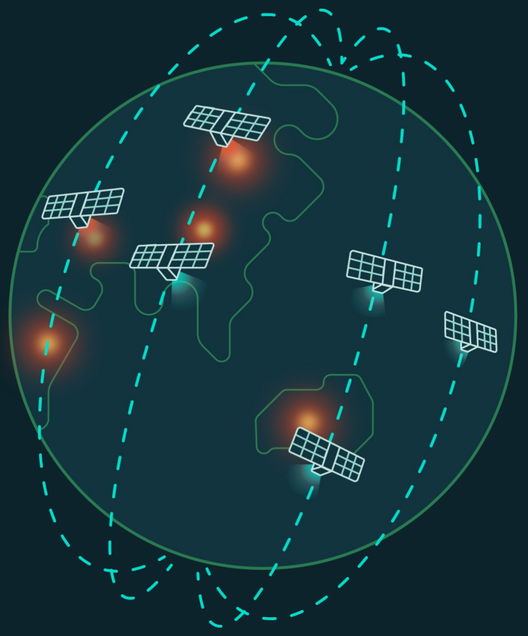
- 25+ Public Satellites

Today

- 8 satellites constellation - operational Beta since March 2026 (2 scans per day in the afternoon)
- 4 payloads onboard Kepler Communications' satellites - first thermal product since May 2026
- 4 satellites for the Hellenic space center were launched on 03.05.206

From 2027

- 80+ OT satellites
- Planned revisit interval of ~30 minutes



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What’s important to us

Completeness

Low latency

Reliability and trust

Provide the right context to facilitate decision making

https://satvis.space/ot?

Why latency is key?

- Customers: “We have 60 seconds from the moment we receive an alert until we have to decide whether to send a team in a helicopter”
- More than an hour of latency is “barely usable” for most customers
- “Fast fires” progress as far as 2 football fields per hour in California (Balch et al., 2024)

Overview - Wildfire Solution Data Pipeline

1. OBSERVATION

Polar (LEO)
Thermal, SWIR, and VIS sensors

Geo (GEO)
Thermal, SWIR, and VIS sensors

2. INGESTION

Global Hubs
AWS, Eumetcast, Geoscience Australia, SAFMIL

Public Direct Broadcast
via CSPP and FY3EL0/1pp

OroraTech-NRT
Active Fire Hotspots, Key metadata

3. PROCESSING

Active Fire Detection Algorithms
Active fire detection processing

Burnt Area Detection Algorithms
Post-fire extent mapping

Fire Confidence Calculation
External weather validation

Transform
ETL

4. AGGREGATION

Aggregation Logic
Spatial & temporal grouping

Master Fire DB
Centralized storage

5. DELIVERY

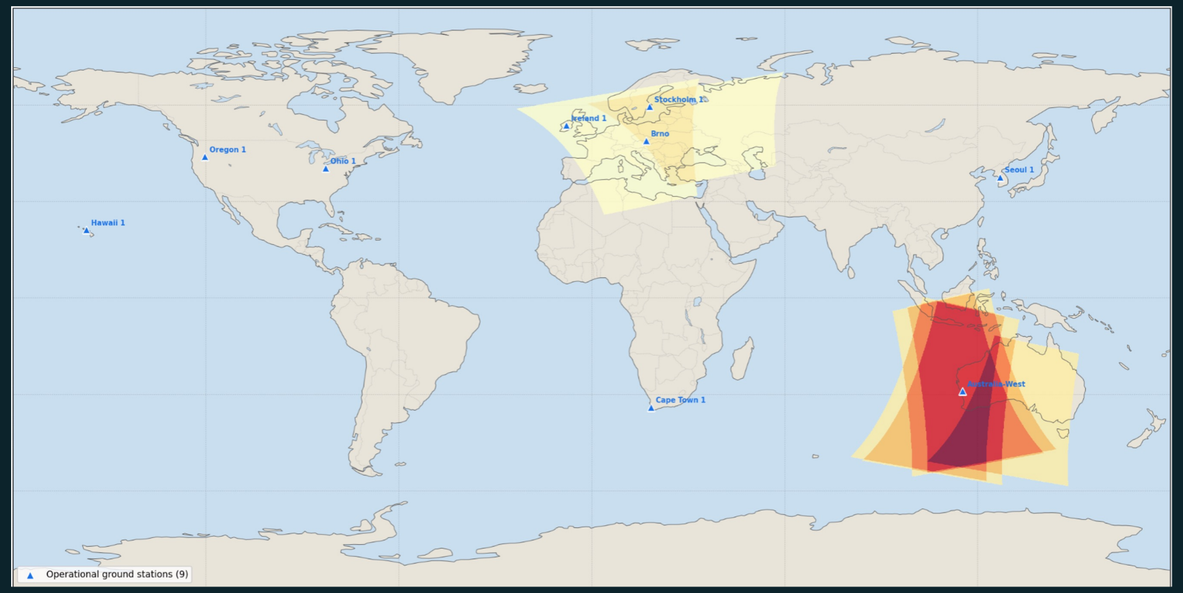
Push Alerting
Real-time notifications

Data API
Derived products access

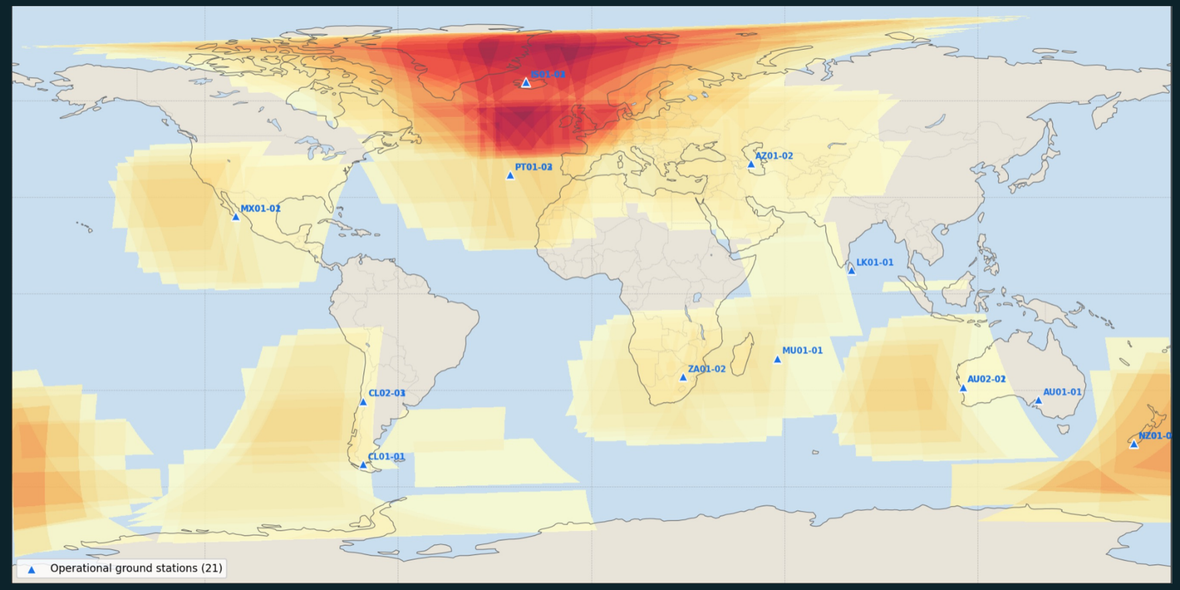
Visualisation

Direct Broadcast Processing

- Used for VIIRS, FY-3E and FY-3F (WIP)
- CSPP is a crucial component of our solution
- For FY-3F lack of available documentation and upstream reliability is still a major issue



FY-3F Received overpasses in ~3 days

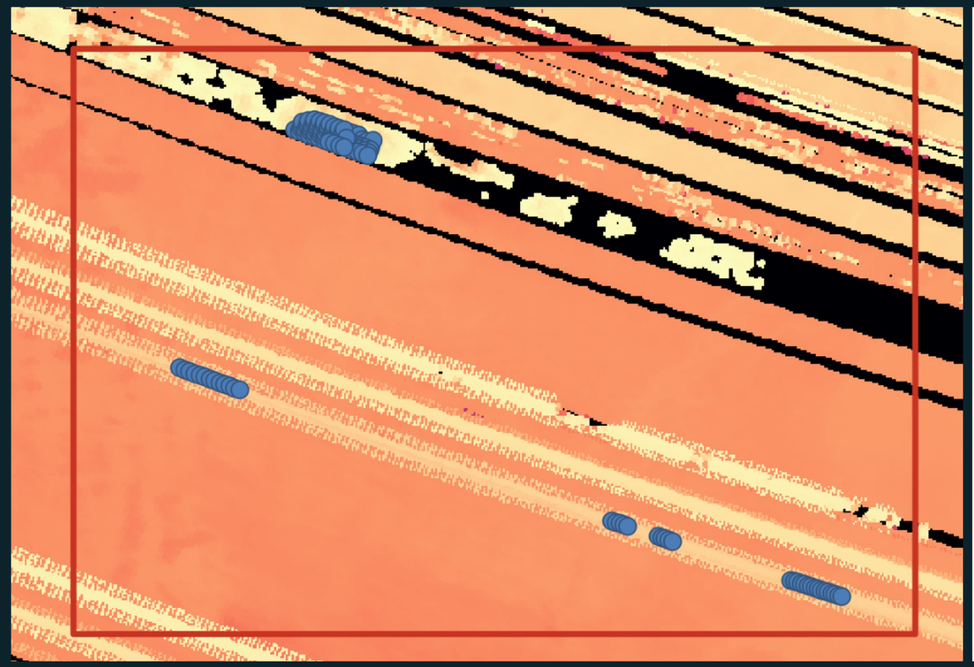


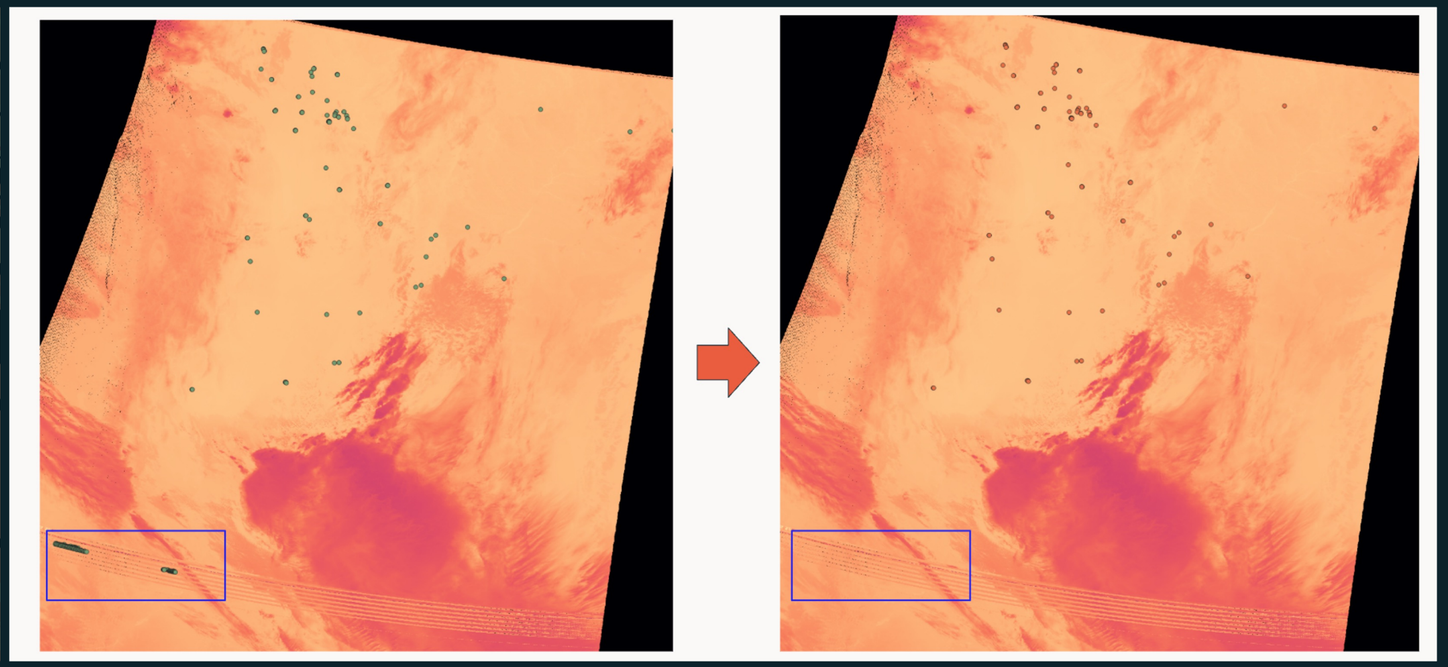
FY-3E Received overpasses in ~3 days

FY-3E

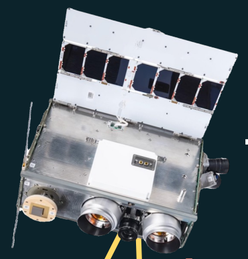
(Extreme) Striping Effect in FY-3E

Artifacts in the form of striping effects with brightness temperature values that were detected as thermal anomalies.
An ensemble of algorithms is needed to remove FP detections





OT On-orbit fire detection



Pre-processing → Fire detection → Compression → Downlink

Level-0 Level-1 Level-2

Space

Earth

Data size: KiloByte domain

Level-3

User alert ← Aggregation ← 

Other detection sources

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OT-NRT Onboard Fire Detection

Operational Beta

Operational real-time wildfire intelligence

Helping your operations today

Coverage when it matters most

Captures early morning and afternoon overpasses, filling up to 6-hour gaps in existing monitoring systems

Sharper fire detection

Detects fires as small as **4x4 m²** at **200 m** resolution *(vs. 375 m with VIIRS)*

Fast insights, low latency

- 49 minutes global median (OTC-P1*)
- <10 minutes with next-generation satellites

Proven detection performance

Independently validated by ESA:

- **77%** overlap with VIIRS detections
- **96%** overlap with Meteosat Third Generation

Wildfire from February-March 2026 as seen by **OT NRT (left)** and **VIIRS (right)** in Chile

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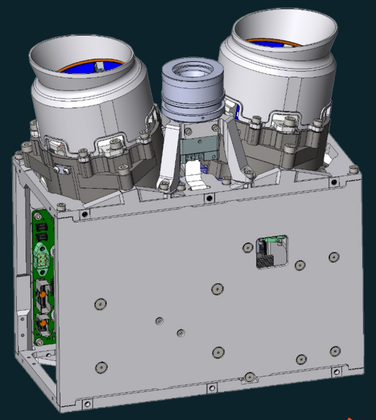
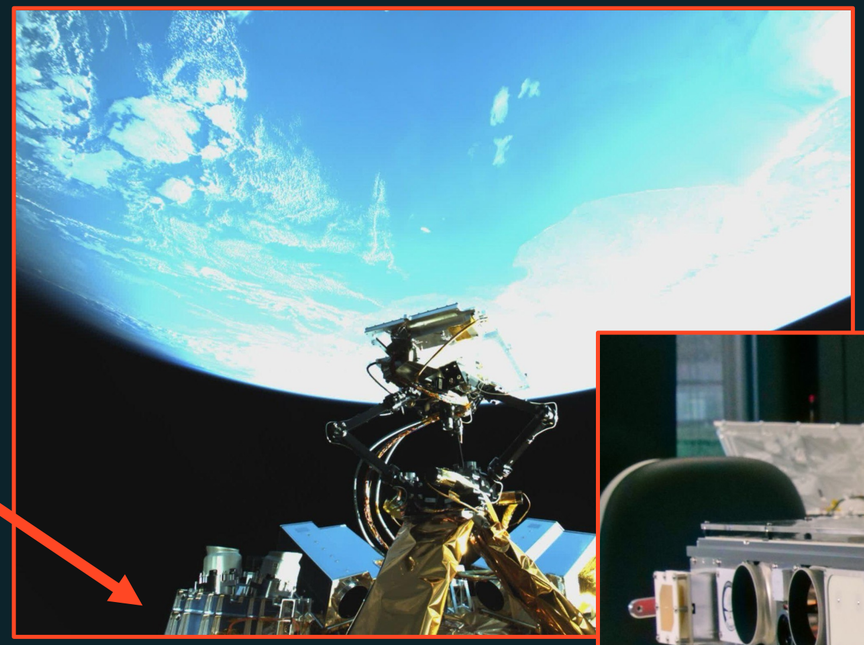
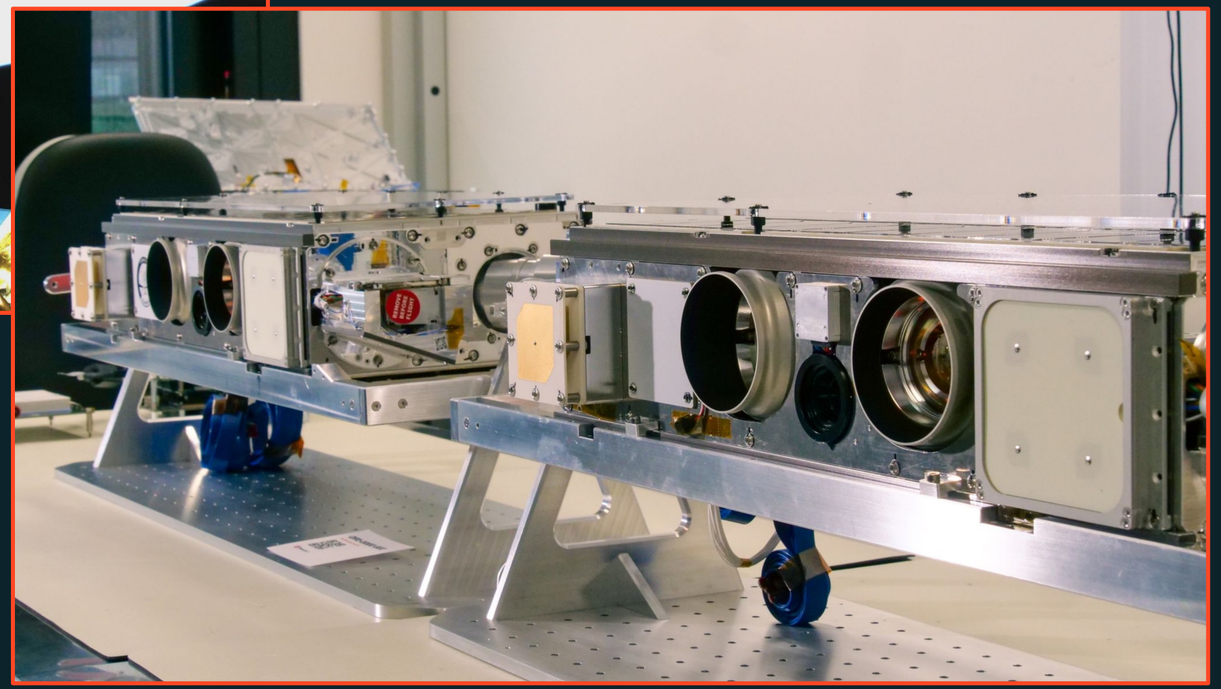
*depending on location

SAFIRE



Safire onboard Kepler’s communication satellite





Safire onboard 2 of the Hellenic Fire Center satellite

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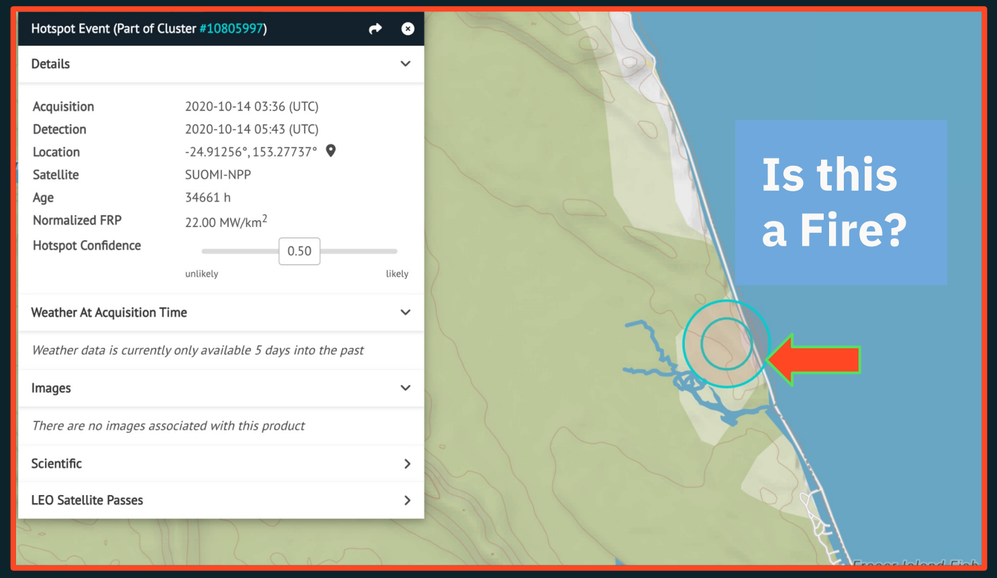
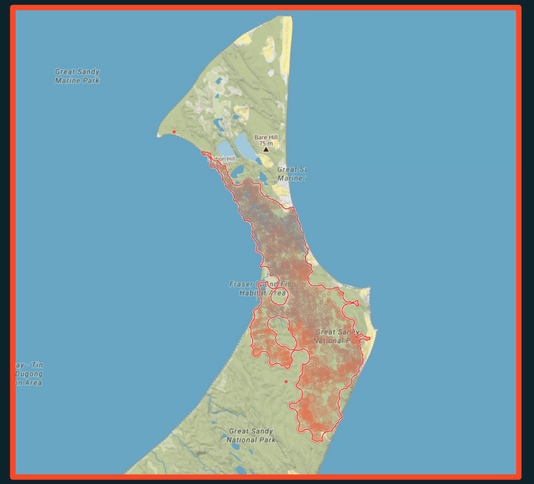
Detecting is not enough...



'Catastrophic' bushfire burns half of Queensland's Fraser Island and threatens ecological disaster

The fire on the world's largest sand island, also known as K'gari, has been burning for six weeks and is encroaching on areas with 1,000-year-old trees



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Fire Confidence

Integrating multi-domain data to validate detections

1. Thermal Anomaly Signature

Evaluating persistence of GEO detections and cross-validating anomalies across multiple satellites and independent algorithms to verify physical fire signals.

2. Fire Behaviour Indices

Integration of meteorological models assessing temperature, humidity, wind, and drought conditions to determine environmental susceptibility.

3. Lightning Ignition Potential

[WIP] Correlating LI sensor data with high-risk vegetation areas to identify potential natural ignition events.

Automatic Industry, Solar panels and Permanent anomalies filtering based on auxiliary sources and our thermal data archive

Validated Confidence Score

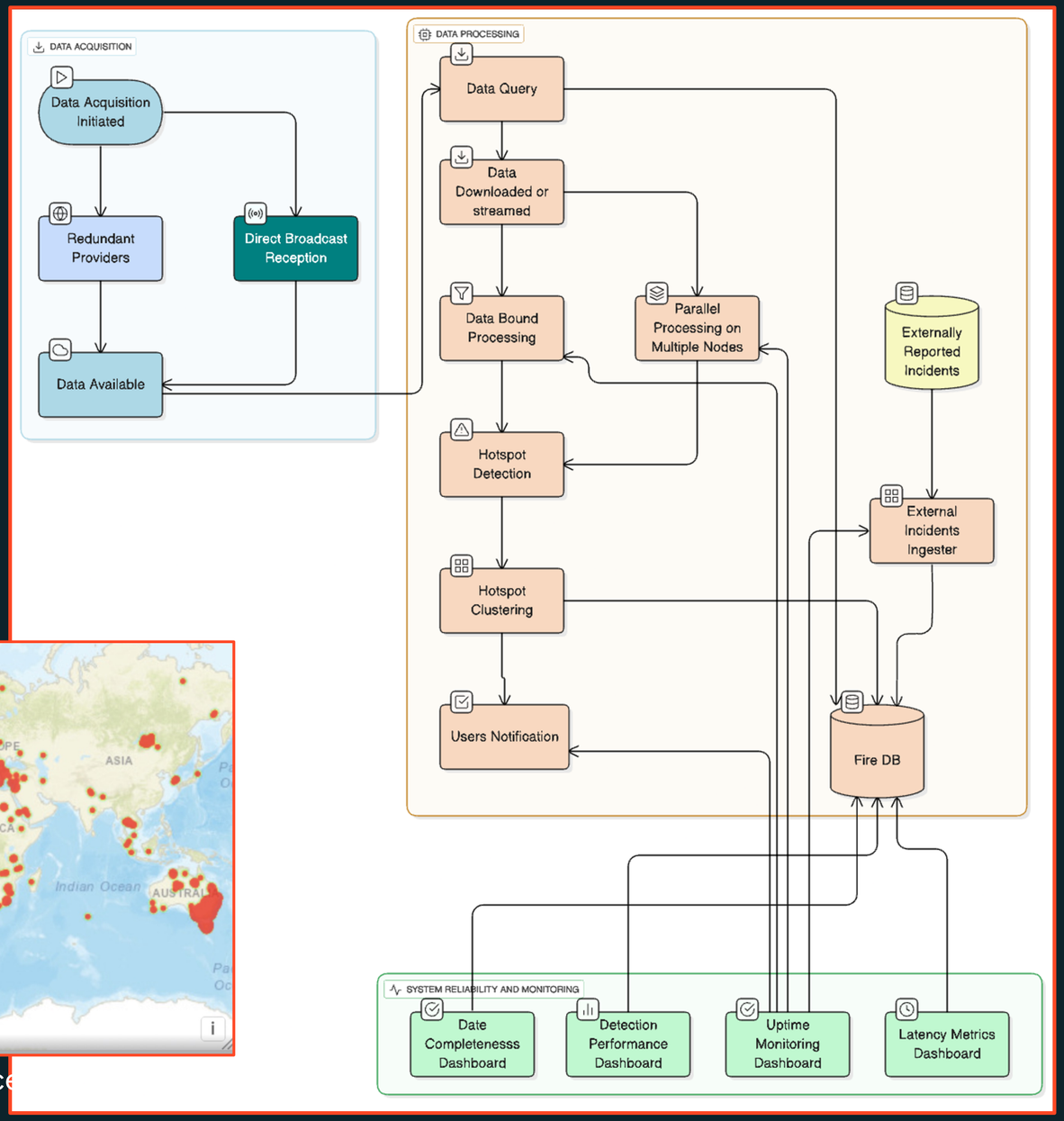
Algorithm fuses raw anomalies with environmental context, filtering false positives (glint, industrial heat) to prioritize operational response.

Validation is Key

We need to know how well we perform

- Continuous ingestion of reference data feeds and user feedback are used to estimate detection performance
- The latency of reference data processing is also important and is being optimised

2 months of reference



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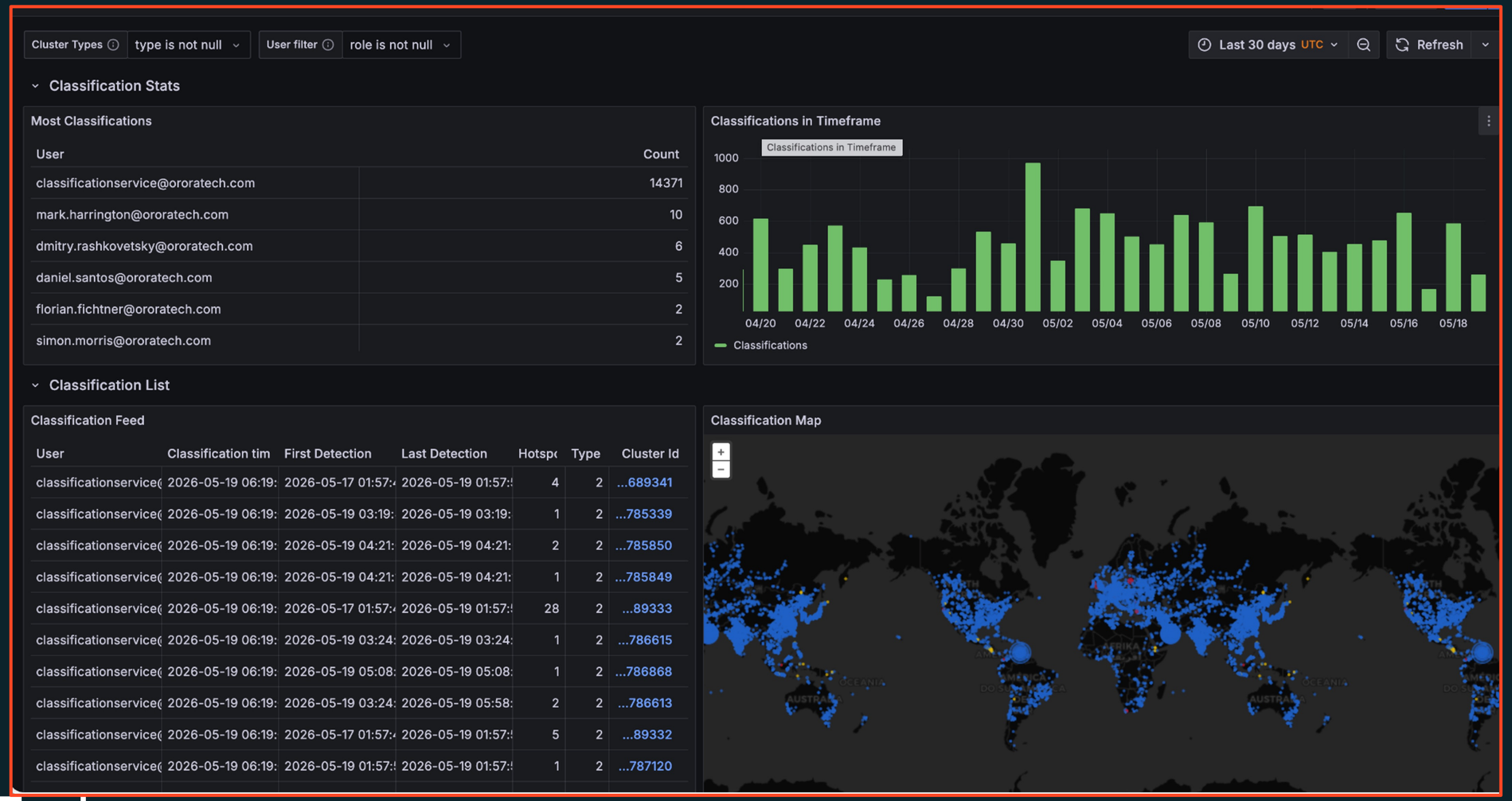
Automatic Classification of Thermal Anomalies

Not all thermal anomalies are wildfires



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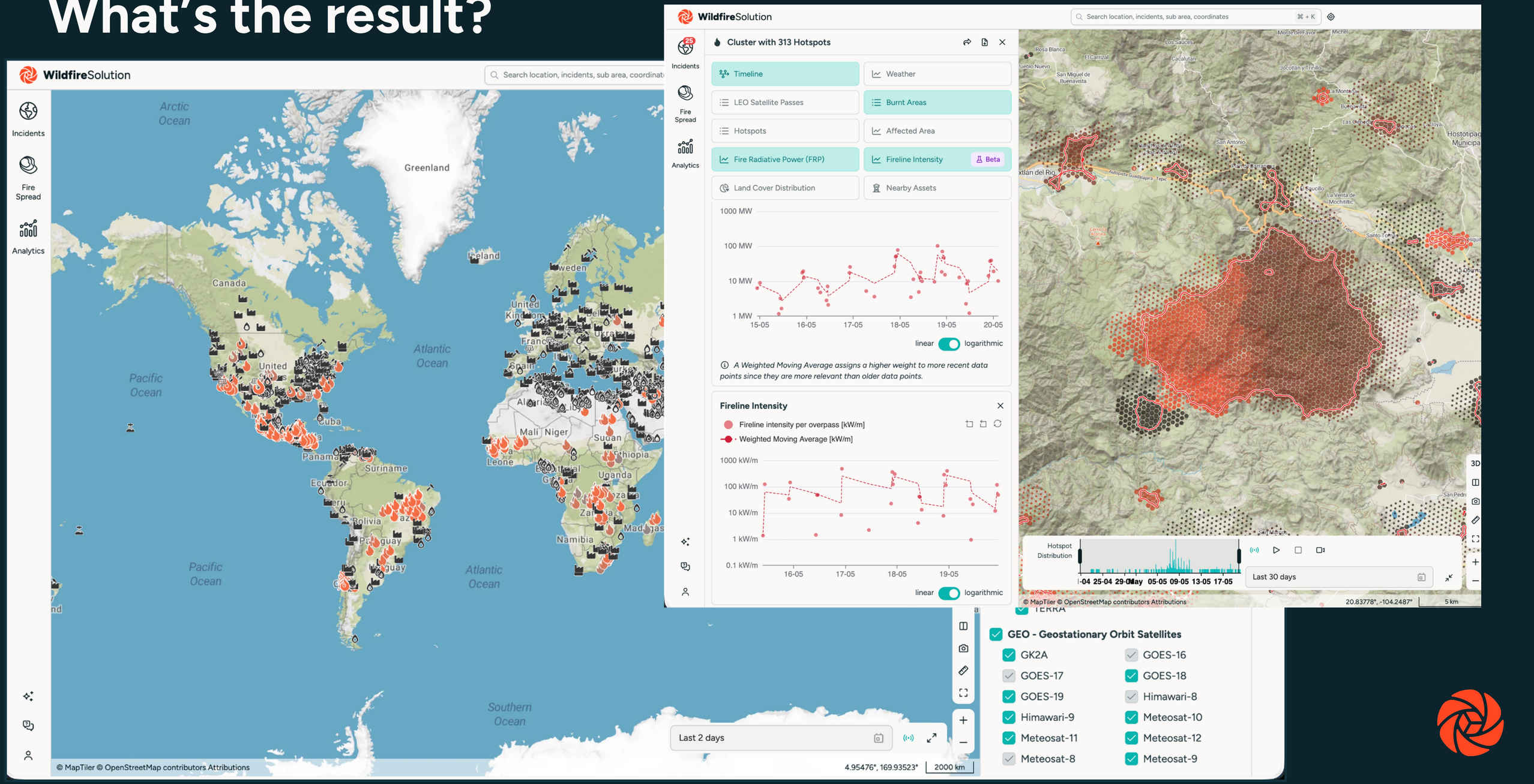
What's the result?



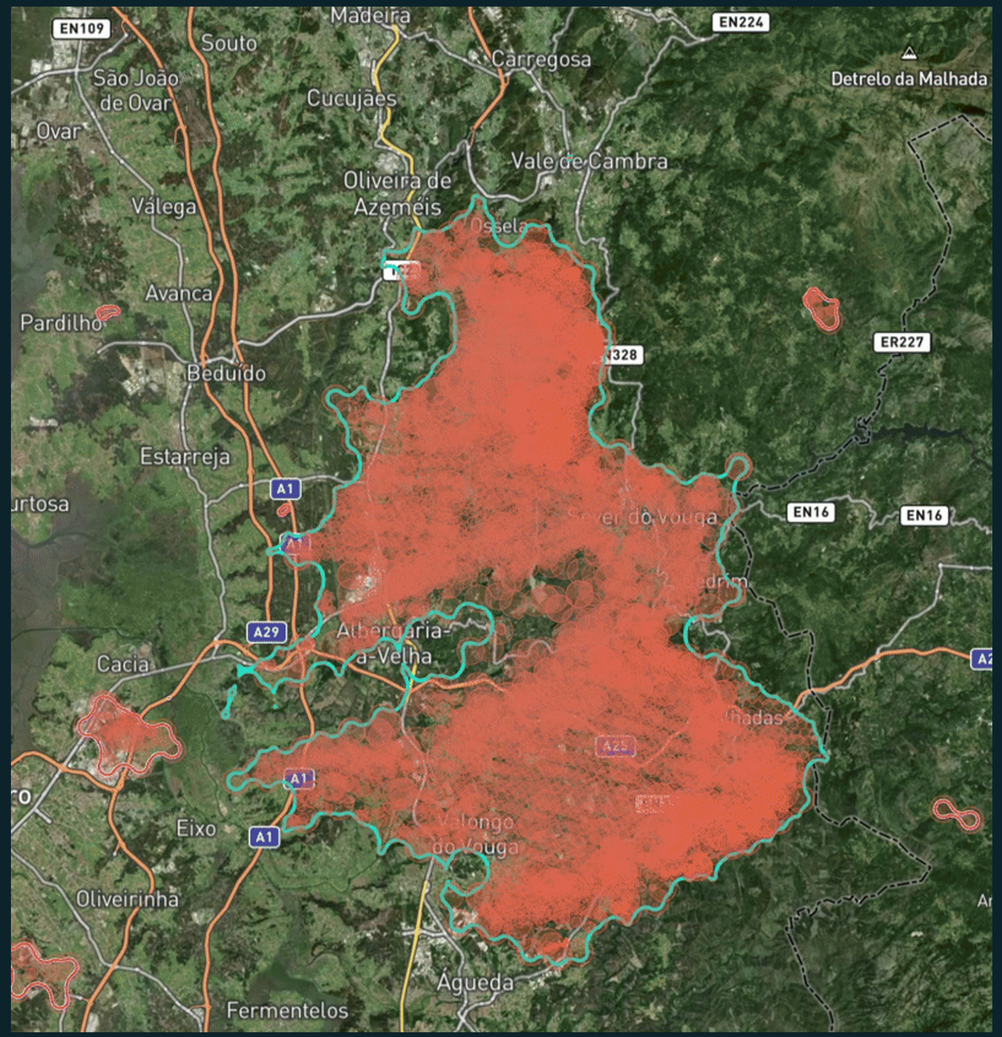
Post-fire impact analysis

After

Understand burnt areas to assess damage and recover faster

Use historical data and interactive analytics to explore past wildfire seasons

Update fuel maps



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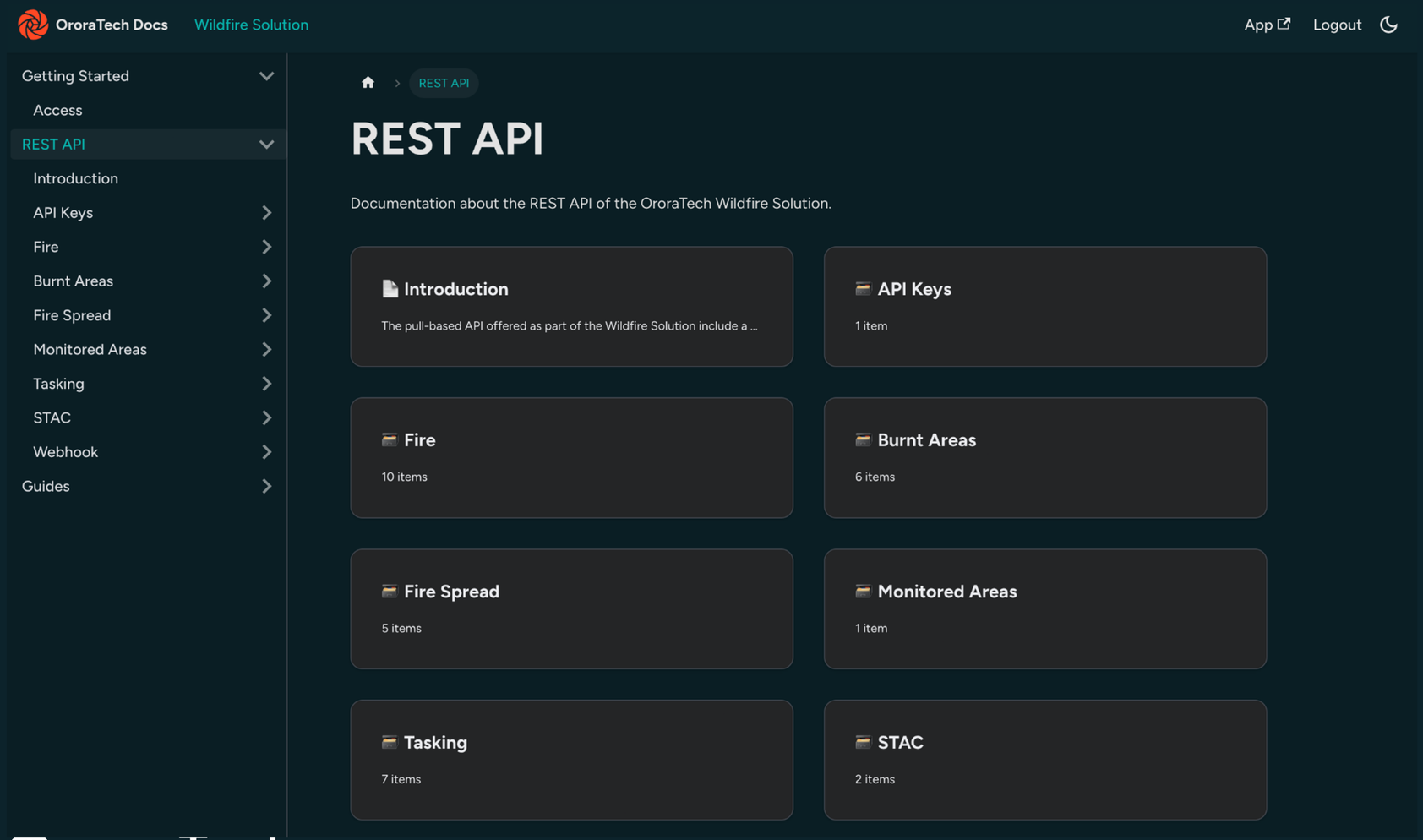
REST API

Available at https://app.ororatech.com/docs/api/



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Thank you!

Questions? ... or find me after the session!

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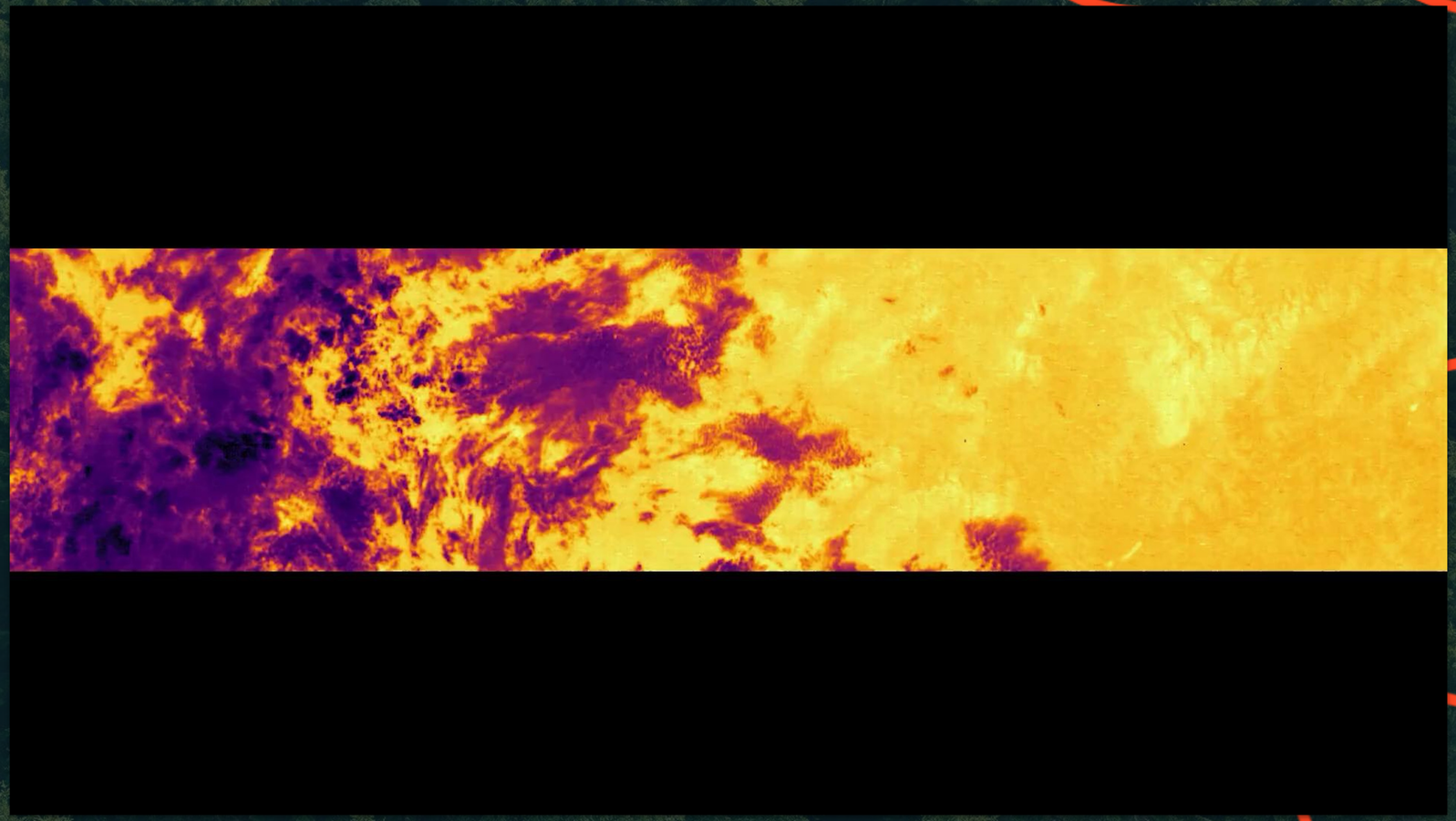

In the video: Thermal data stream for SAFIRE onboard Kepler's communication satellite

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