

Workshop on Enhancing Int'l Cooperation for  
Integrated Forest Fire Mgt.

June 17<sup>th</sup> 2025, Ankara  
World Bank/Turkish Govt.

# Integration of Technology in Wildfire Management

Case Study: South Korea

Mr. Kiyeon Ko

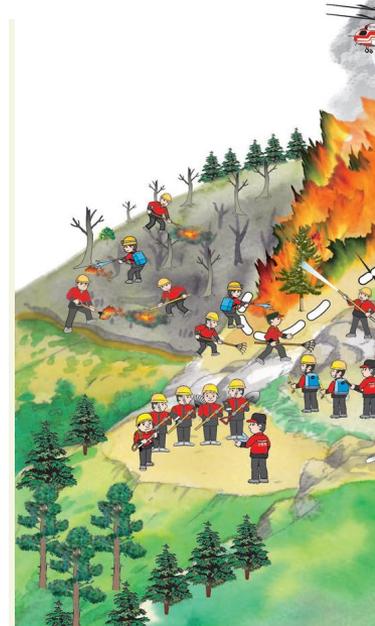
President, Korea Forest Fire Society

Ankara Regional Dialogue – Day 2, June  
2025

# Introduction

- Wildfires in Korea: >400 fires per year, 64% forest coverage
- Climate change → faster, more destructive fires
- Integrated technology needed for prevention, detection, and suppression

Use



# Integrated Forest Fire Management – System Structure

- Fire Weather Forecast → Danger Index Analysis → Risk Assessment
- CCTV/Drone/Satellite Surveillance → Early Detection
- Digital command center (e.g., Forest Fire Situation System)
- Linkage between forest, fire, disaster, meteorology agencies

## Forest Fires Headquarter



# Forest Fire Response System using ICT



The Forest fire Risk Forecasting System provides a Forest fire Risk Index.

Forest Fire Reporting on GIS : Forest ranger & fighter, Citizen, National Fire Agency(119).

At the fire-fighting stage, collected information (in real time) are essential in making accurate commands and decision-making

Sharing for real-time progress with central, local government , field HQ, and citizen, etc.

**System Contents**

- Fighting Resource
- Potential hazardous (for people & Structure)
- Weather (wind direction & intensity, temperature, Relative Humidity)
- Geographical features (slope, height, Ridge, valley)
- Forest condition (Tree) and so on

**감시원연황**

과거상황신고 | 전자순찰량  
최종이력 | 활동시간차트

감시원연황

성명	연락처	상태
김우철	010-9329-4163	상대
공용현	010-9402-5040	상대
김우현	010-9594-3395	상대
김종훈	010-3559-0454	상대
박종우	010-6252-9378	상대
이정우	010-4922-3481	상대
박성규	010-3992-7190	상대
이재환	010-9205-7254	상대
이재호	011-831-0247	상대
이준호	010-3389-2281	상대
김정기	010-4769-6200	상대
한승우	010-2412-0833	상대

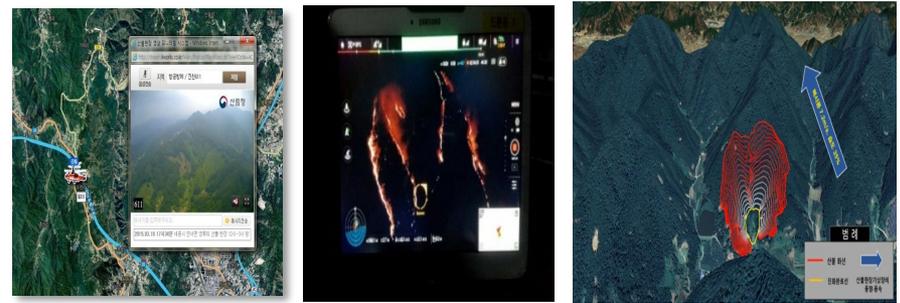
# Integrated Field Operations

- Smart Fire Command Vehicles + GPS Tablets + Live Video Feeds
- Air-Ground integrated response: Helicopters + Ground Crews
- Digital Cockpit: Real-time coordination of suppression assets
- Remote control of unmanned surveillance equipment

## ▶▶ Sharing Forest Fire Information with Gov.



## ▶▶ Analysis (Photo, Weather, Forest Fire Spread Prediction)



# Community Safety and Prevention

- Evacuation alerts via SMS, TV, mobile app and sirens
- Public participation: fire watch volunteers, early reports
- Forest access control during red-flag conditions
- Education campaigns, fire shelters, outreach programs

## ▶▶ Sharing Forest fire information to

Citizen



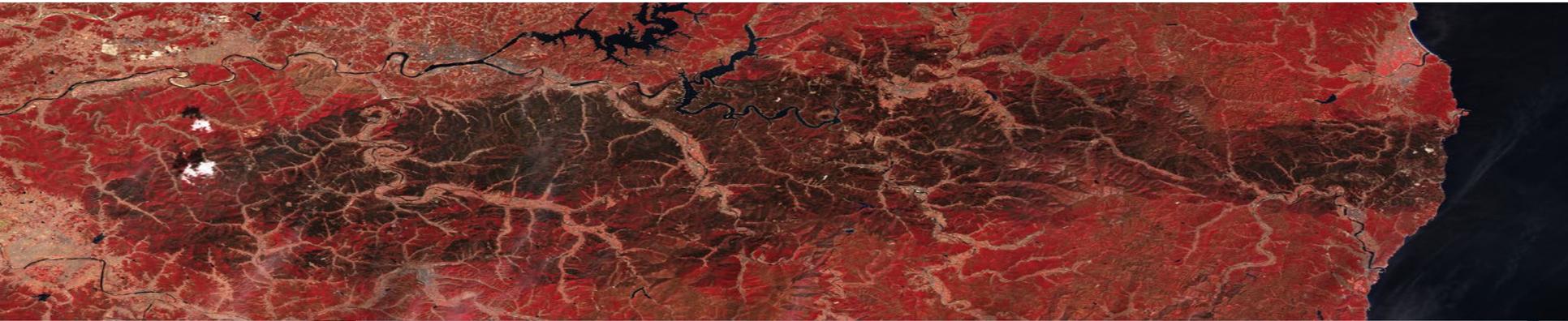
- Mobile App : Forest fire alarm, evacuation
- Broadcasting Company : Forest Fire status

## ▶▶ Forest Fire Fighting(helicopter, fighters, etc.)



# 2025 Yeongnam Mega Fires – Overview

- 20+ large wildfires erupted simultaneously across SE Korea
- Strong winds, steep terrain, low humidity: rapid spread
- Response overwhelmed – highlighted gaps in aerial capability



# Challenges in Aerial Firefighting(2025 Case)

- Helicopter limits: visibility, flight time, water capacity
  - No night-time aerial suppression possible
- Simultaneous fires caused severe resource shortage



# Korean Mechanized Suppression System

- Mid-size pumps + 13mm hoses reach deep forest areas
- Pulley systems reduce labor on steep terrain
- Portable tanks + manifolds enable multi-hose



# Nighttime Wildfire Response

- System enables firefighting after dark (no helicopters)
- Suppresses embers and prevents re-ignition
- Regular training ensures rapid night deployment
- Key to avoiding next-day flare-ups



# Recommendations

- Introduce UAVs for detection and night ops
- Deploy fixed-wing aircraft (e.g., C-130s) for heavy suppression
- Develop drone swarms with aerosol suppressants
- Invest in a real-time digital command & coordination system



# Conclusion

- Technology must support full-cycle fire management: prevention to recovery
- Korea's integrated systems show the potential for effective response
- Continued innovation, training, and cooperation are key
- We must adapt to fires that now burn faster, hotter, and longer

# Turkey Wildfire Defense

Our Thermal Satellite  
Network for Unmatched  
Protection

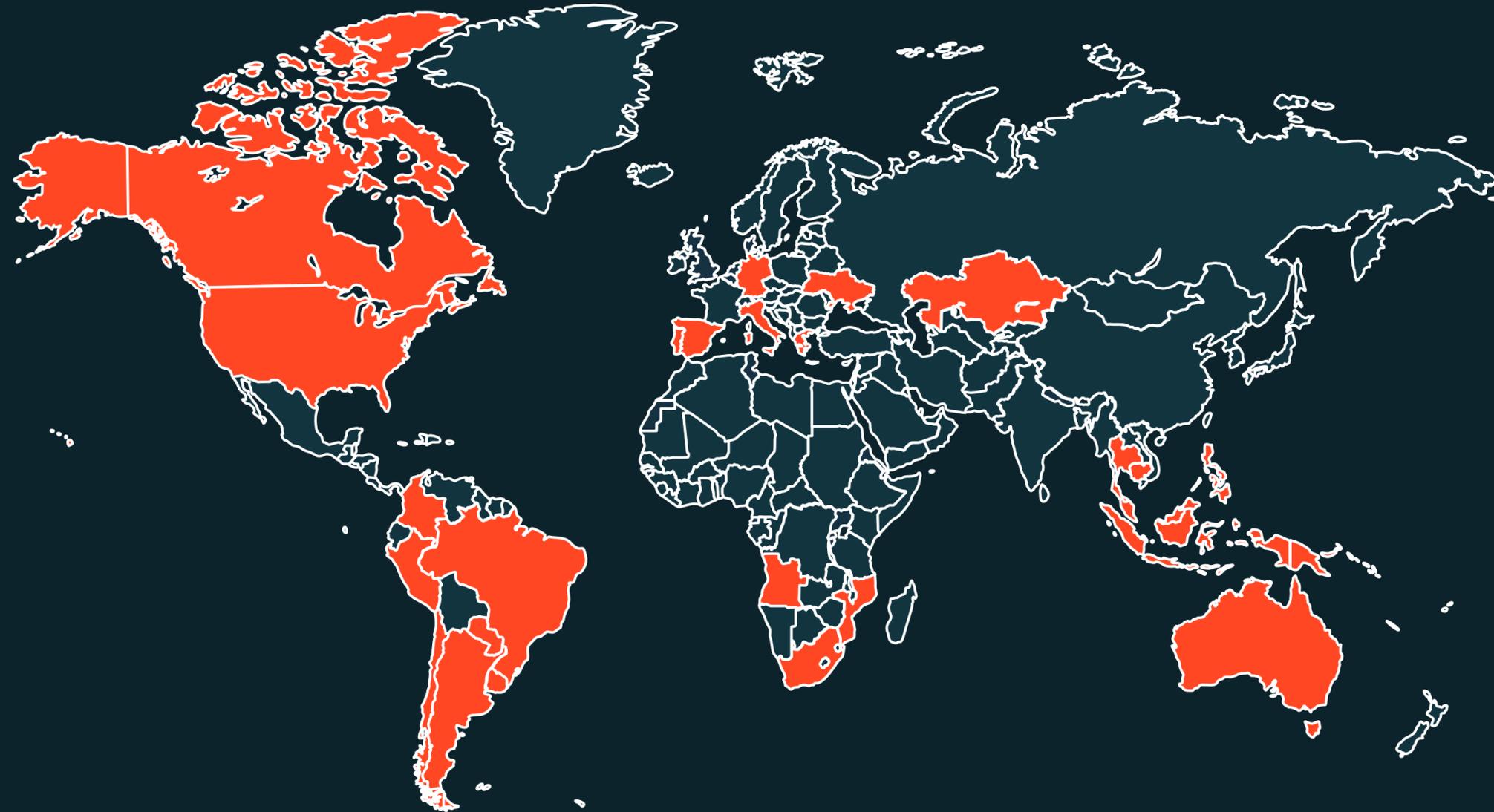
OroraTech



# OroraTech: Trusted by governments & industry across the globe

**500+**  
users in  
25 countries

**450M**  
hectares of  
monitored area



**27+**  
satellite  
sources

**130+**  
employees on  
5 continents



# Wildfire management for every stage of the fire cycle

## OroraTech's Wildfire Solution

### Before

#### Risk Assessment

- Weather information
- Fire danger index and forecast
- Vegetation and terrain analysis
- Spread Risk Modeling

### During

#### Fire Detection

- 24/7 observation from 25+ satellites
- Automatic notifications via email, SMS, WhatsApp, etc.
- Accurate fire location and affected area

#### Near-real-time monitoring

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

### After

#### Post-Fire Analysis

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



# Fire detection

## During

Protect your area with precise fire detection and automatic alerts, including detailed information on location, intensity, and affected area. Access the largest satellite network for continuous coverage - even through smoke, at night, and during the afternoon gap.

16 – 24\* daily scans  
>10x10 m fire size

Proprietary detection  
algorithms

Fire confidence &  
classification

Direct downlink  
technology



\*16 is the least number of overpasses. For higher latitudes the number of daily scans can be even higher than 24. Contact us for more information for specific regions



# Near-real-time monitoring

## During

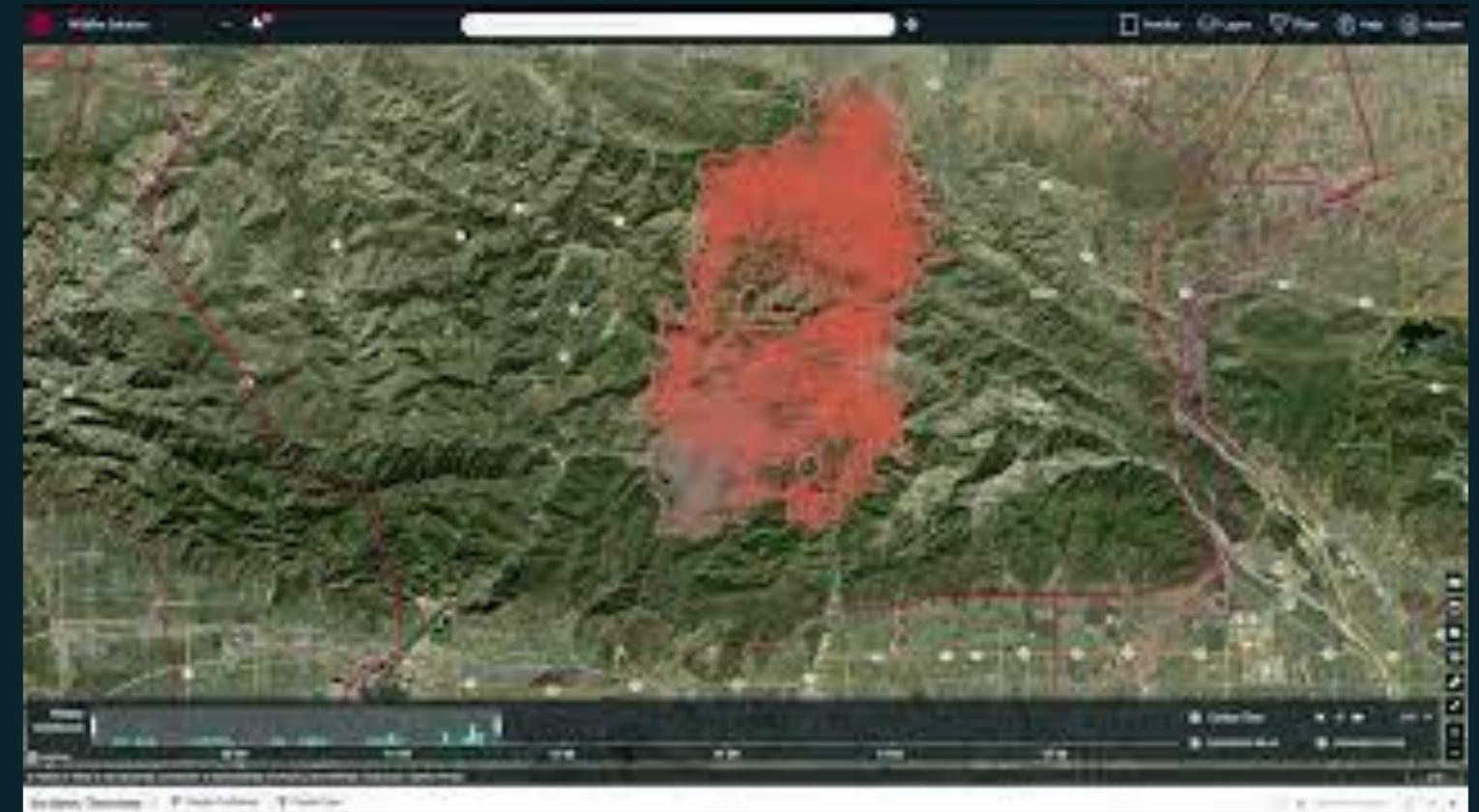
Maintain continuous situational awareness by tracking fire progression and rapidly simulating potential spread – identifying high-risk areas early to support decisive action and efficient resource deployment.

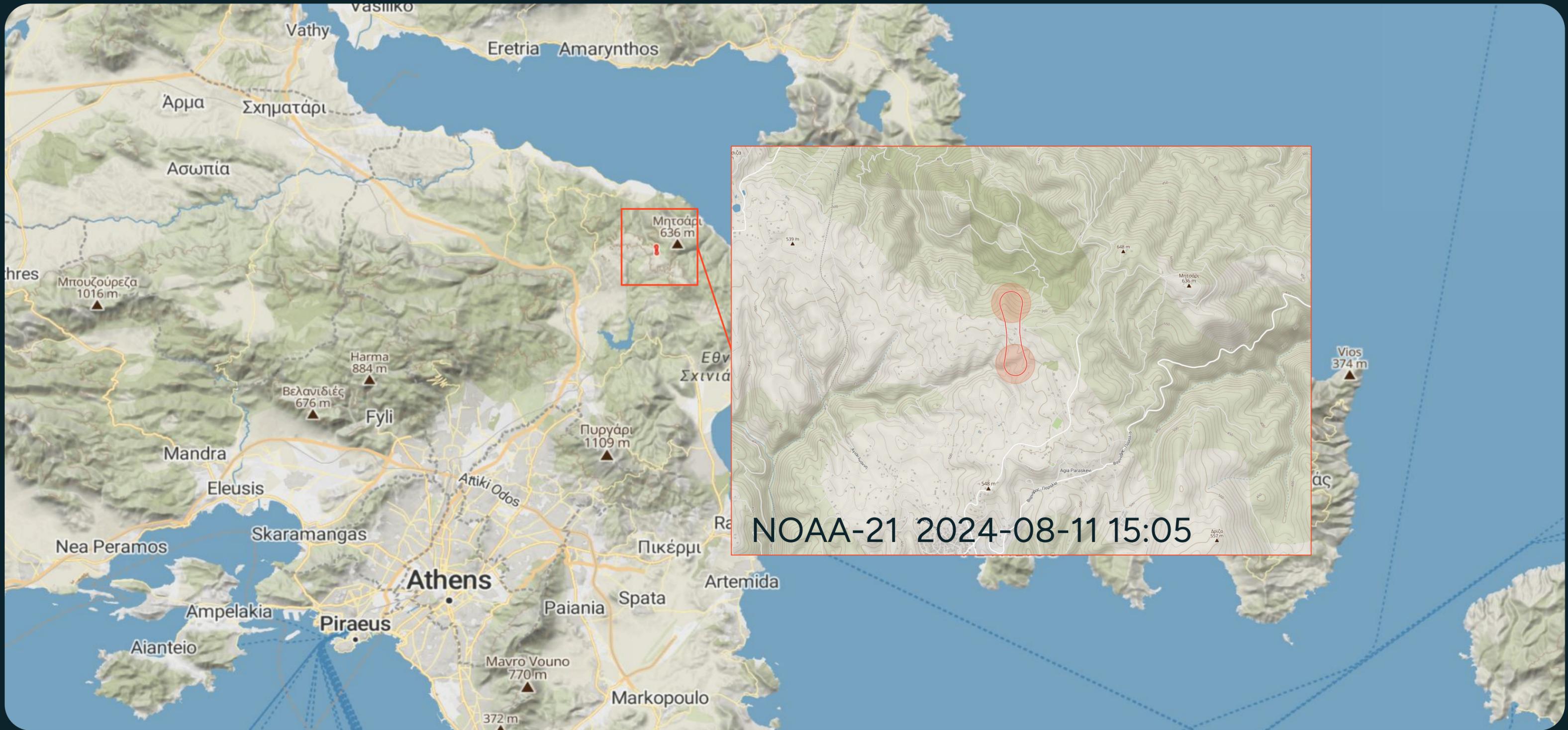
Spatio-Temporal  
Clustering

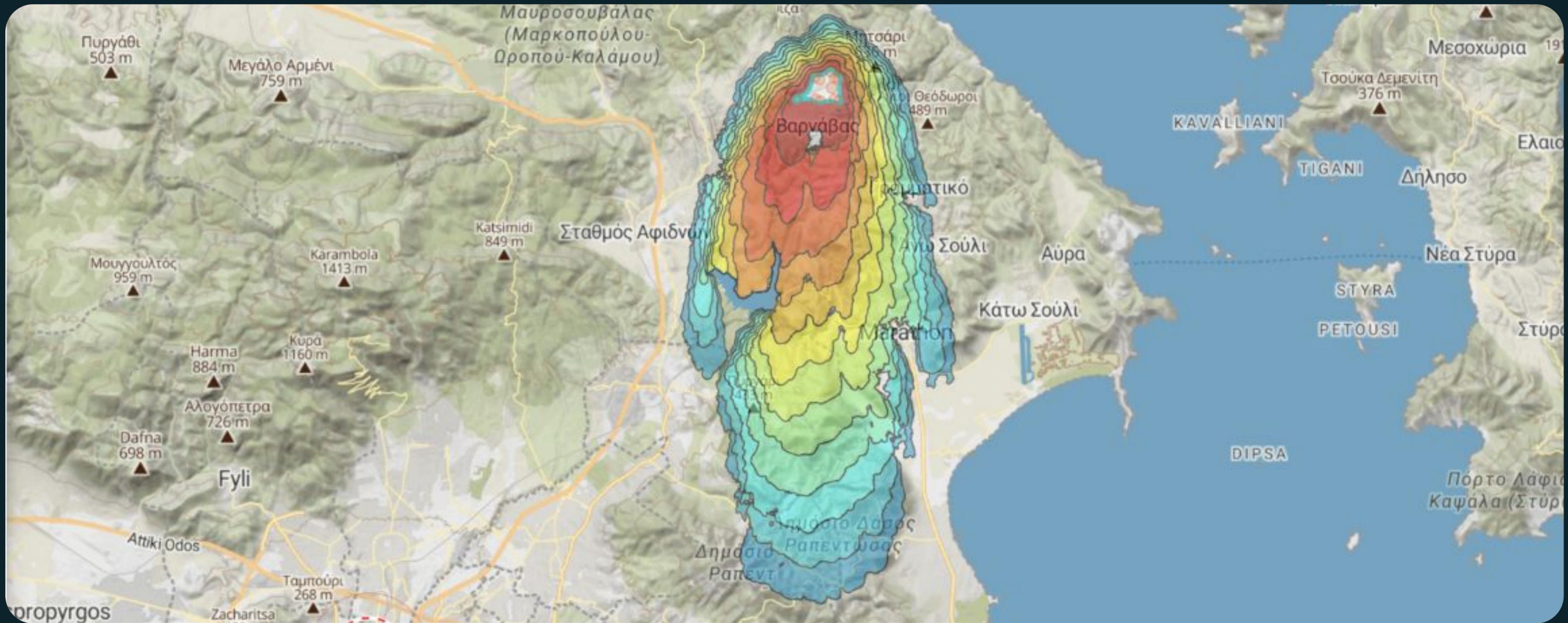
Incident Overview

Predictions up to 24  
hours

Customizable input  
data







# Fire Spread Simulation

Based on Satellite Data



# Situational Awareness During Suppression Efforts

- 702 Firefighters
- 199 Vehicles
- 27 Forest Commando Groups
- 17 Aircraft
- 8 Helicopters



# Post-fire impact analysis

## After

Gain reliable insights into fire-impacted areas to estimate losses, guide recovery, and plan for future risk. Leverage historical data and interactive visuals for faster, smarter decision-making – saving time and reducing costs compared to conventional methods.

Burn severity & confidence

Automatic mapping (2-3 days)

Analytics Dashboard

Fire ignition and extinction timestamps



# User data customization

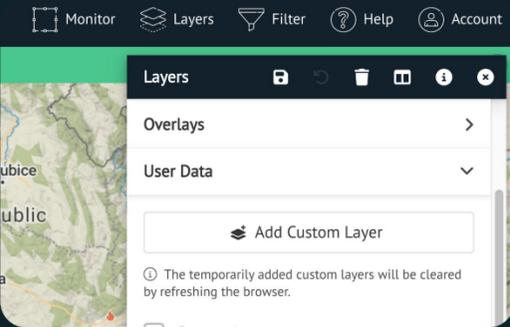
Easy to integrate & API Access

Wildfire Solution



## Custom data integration

Incorporate custom data layers (e.g. fuel maps, weather maps, etc.)



## Aircraft

Track and coordinate aerial aircraft flight paths efficiently in real-time.



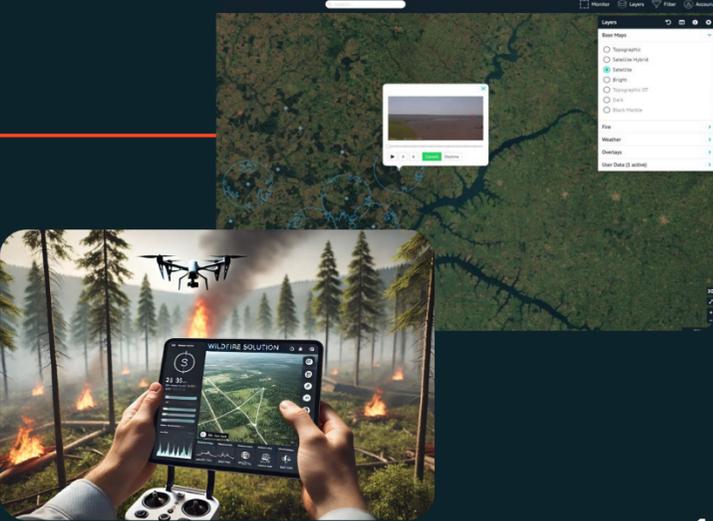
## Tracker

Live tracking of teams and vehicles for safety and full situational awareness.



## Drones & Cameras

Gain a complete view of all fires by combining drone data and ground-based cameras.



# Empowering today – building a resilient tomorrow

Since  
2020

2025

From 2027

## FOREST 1, 2 & 3

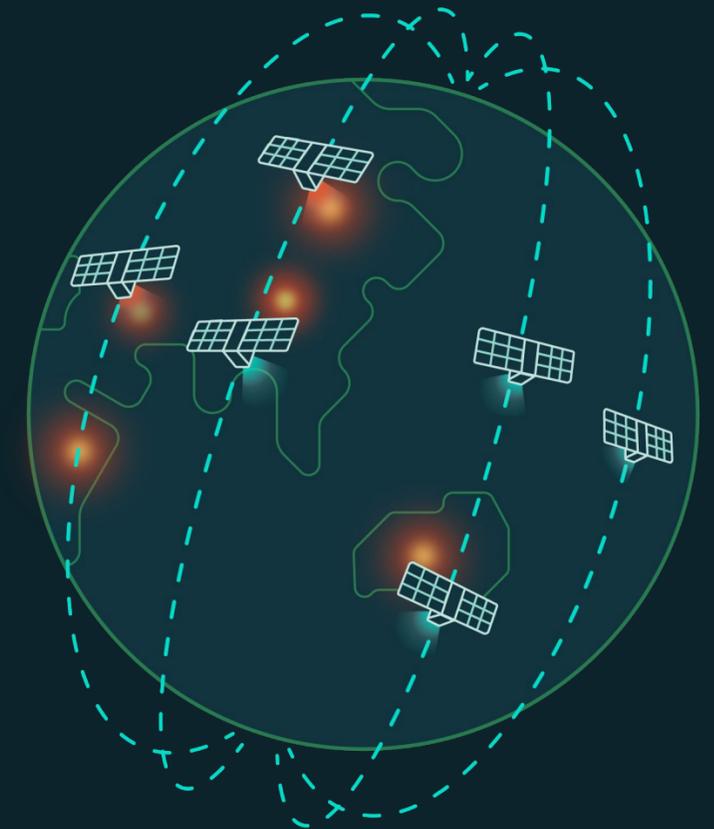
- + Public Satellites  
ca. 16 daily scans

## WFS Pro SL1

- + 8 OT satellites
- + 2 daily scans to close the afternoon gap

## WFS Pro SL2-SL5

- ca. 80 OT satellites
- Up to 48 scans per day



# Fire doesn't wait – neither do we

Speak to us today to see how OroraTech can support your wildfire management strategy.



**Konstantin Pieper**

Dpty. Head of Sales

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**OroraTech**



# Case Studies

For reference, please see a selection of our case studies highlighting real-world applications and outcomes:

- [National wildfire system for Greece using OroraTech technology](#)
- [Canada's national wildfire system, developed in partnership with the Canadian Space Agency](#)
- [A collaboration between OroraTech and the Tasmania Parks and Wildlife Service](#)



# OroraTech's Government Solution

## Greek National Wildfire Monitoring System



The Hellenic Space Center (HSC) invested **€20 million**

... to develop a national satellite-based wildfire management system in collaboration with OroraTech. Data from the system are being integrated into Greece's national disaster management infrastructure to **support real-time monitoring and decision making.**

## Canadian Space Agency WildFireSat



The Canadian Space Agency (CSA) invested Can\$72m to develop a national wildfire monitoring satellite constellation in collaboration with OroraTech.

WildFireSat is expected to **save the Canadian economy...**

**\$1 - \$5 billion**  
in its first five years of operation.







## Earth Fire Alliance

### A Global Community-Led Nonprofit

Committed to delivering transformative real-time data from all wildfires on Earth, changing our collective approach and relationship to fire.



## FireSat

### The Alliance's Flagship Program

A space-based fire detection and characterization system designed specifically for wildfires, providing timely and trustworthy wildfire activity data directly to agencies around the world who protect their communities.

# FireSat Overview Brief

- FireSat Introduction
- Protoflight
- Initial Operational Capabilities
- Full Operational Capabilities
- Data Products





# FireSat Recent Project History and Future Steps

## USER-COMMUNITY

Core users including Frontline, Incident Command, and Fire Modelers, make up the backbone of a growing community that guides requirements definition

## VALIDATION

The FireSat design is independently reviewed and validated by a third party.

## EARLY-ADOPTERS

Early adopter engagement with core users to develop data products and understand seamless systems integration.

## IOC

Initial Operational Capability is reached with the launch of the first 3 satellites in Q2 2026 offering FireSat's full data capabilities in key geographies every 12 hours.

## FOC

Full 50+ satellite FireSat Constellation achieved by 2029. Full Operational Capability offers 20-minute global revisit.

2022



### CONVENE

Multiple key stakeholders who have been independently workshopping and researching the problem convene for a feasibility study with the Environmental Defense Fund.

2023



### FIRESAT

FireSat technical design is developed to fulfil specific user needs, namely: timely and trustworthy new fire alerts, up to the minute perimeter maps, and global monitoring of the full fire lifecycle and carbon impacts.

2024



### EARTH FIRE ALLIANCE

A global landscape analysis informs development of a business case and sustainment model.

Earth Fire Alliance is founded as the nonprofit home and champion for FireSat.

2025



### PROTOFLIGHT

Protoflight launched in March 2025 and will provide testable data products and reduces risk for the mission critical constellation.

2026



### GLOBAL ACCESS

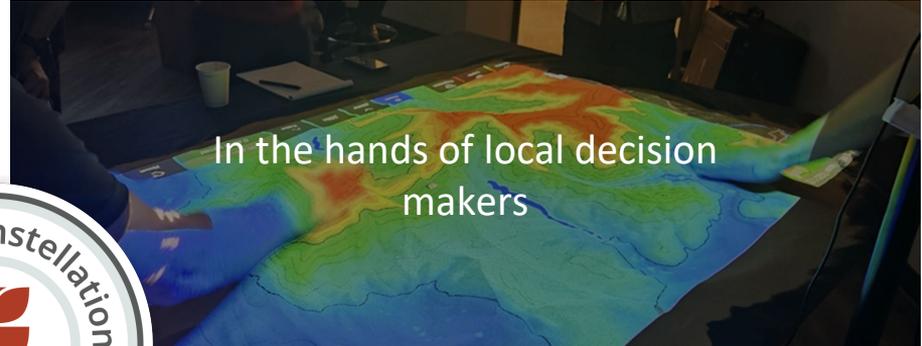
User-community rollout on a global scale, ensuring equitable access to agencies around the world who protect their communities.

2029





# FireSat: A Wildfire Gamechanger



# FireSat Introduction

- Earth Fire Alliance is a global, community-led, non-profit coalition aligned to deliver transformative real-time data detecting and monitoring fire activity on Earth.
- FireSat is a first-of-kind satellite constellation focused specifically on fire, fire conditions, and fire's ecological effects. The FireSat system will provide a consistent, accurate, and comprehensive view of fire activity globally.
- The FireSat constellation will deploy 50+ satellites in LEO, each with a wildfire-first multispectral imager, to provide unprecedented spatial and temporal coverage, providing unmatched data with unmatched quality, revisit, and latency.



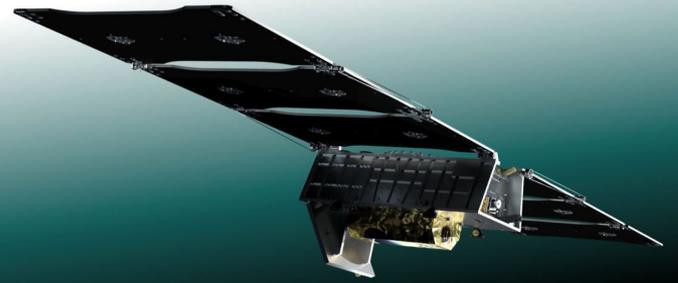
**Earth Fire Alliance**





# FireSat Overview

- **Global Coverage**
  - *Orbits at SSO, 53°, 70°*
- **Multi-satellite constellation - up to 50+ Spacecraft in full constellation**
  - **Deployed in two phases - Initial Operational Capability (IOC) and Full Operational Capability (FOC)**
- **Multispectral Instrument**
  - *6 channels VIS through LWIR*
  - *2 MWIR to delineate fire intensity*
- **High Spatial Resolution**
  - *80m average GSD, 50m @ nadir*
- **Rapid Cadence of Observation**
  - *<20 mins mid- to high-latitude*
  - *<60 min equatorial latitude*
- **Full bandwidth, low-latency downlink**
  - *Near-real-time in key geographies*



A NEW ERA IN FIRE MONITORING

## Meter-scale resolution. Real-time revelations.

This wildfire focused system will provide a consistent, accurate, and comprehensive view of fire activity for every fire on Earth. FireSat will deliver near-real time data within minutes of observation, and that's just the start...



50 fire-focused  
satellites



Global  
intelligence



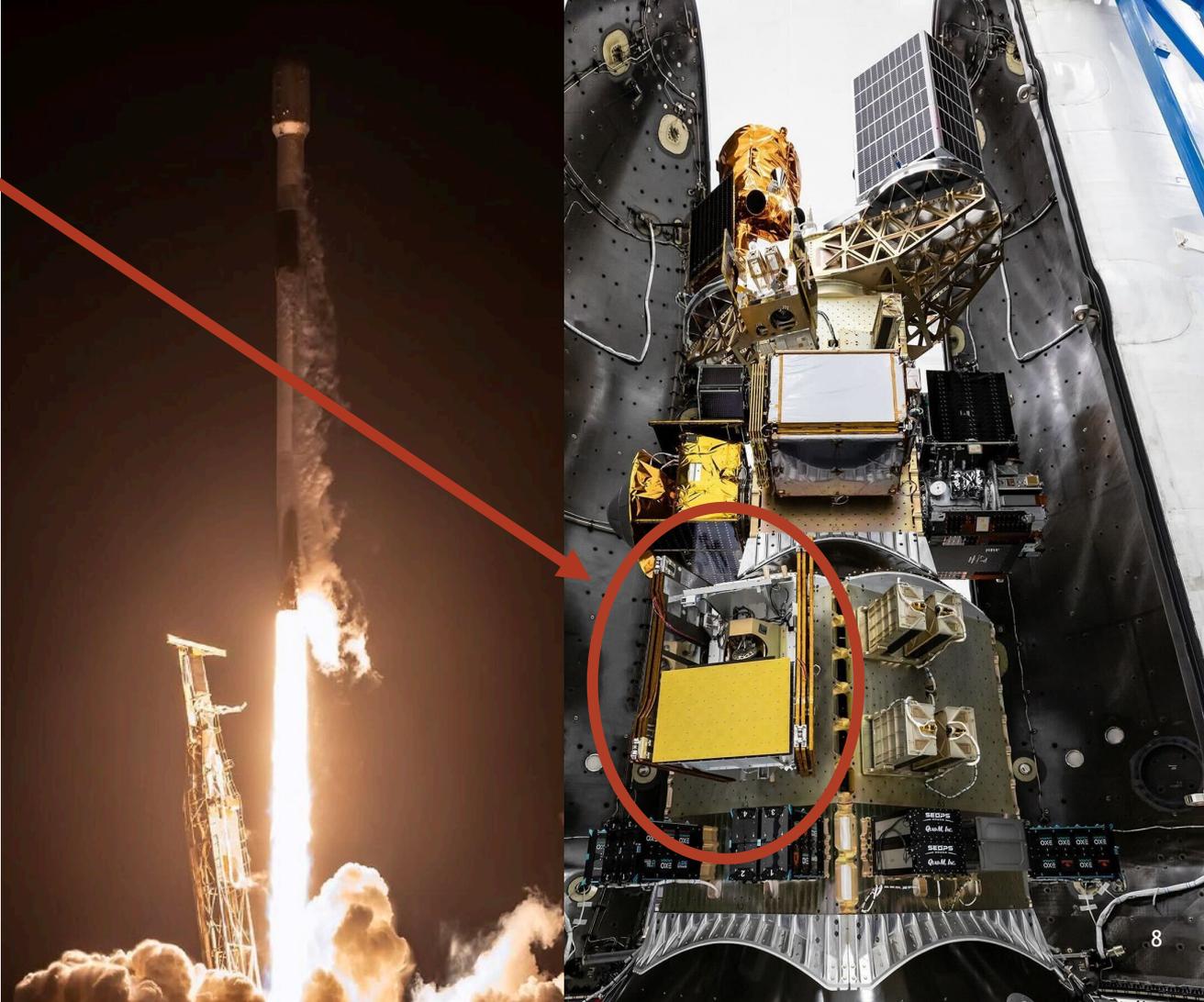
Data in minutes,  
not days



Precise location  
alerts

# Protoflight

- Launched on 14 MAR 2025 onboard SpaceX Transporter-13
- First FireSat sensor launched to space provides a testbed for data processing and delivery



# Initial Operational Capability

- On-orbit demonstration of key enabling FireSat technologies (spacecraft, instrument, data processing, etc.) and delivery of operational wildfire data products to Early Adopter agencies and organizations
- Mission Scope:
  - *3x satellites with multispectral payload*
  - *Launch booked Q2 2026*
  - *Sun-synchronous orbit, 600 km*
  - *Fire detection, fire perimeters, fire progression, fire radiative power*
  - *Fast data delivery for key geographies*
  - *Precursor to the Full Operational Capability*



# Full Operational Capability

- 20-minute revisit rate for mid-latitude geographies from multi-satellite constellation with global coverage & data distribution
- Fire data and products for
  - *Frontline / First Responders*
  - *Incident Commanders / Fire Managers*
  - *Modelers (Fire Scientists)*
  - *Scientists and Researchers*





# Earth Fire Alliance

Observe. Serve. Conserve.

---

[hello@earthfirealliance.org](mailto:hello@earthfirealliance.org)



**SKYWARD**

**PREVENTING  
LIGHTNING FROM  
IGNITING MEGA  
WILDFIRES**

[www.skywardwildfire.com](http://www.skywardwildfire.com)

PROPRIETARY & CONFIDENTIAL

# THE SKYWARD SOLUTION

Skyward is a climate & fire solution that prevents lightning, when and where needed, from starting catastrophic wildfires

Skyward is the world's first lightning prevention company

Skyward protects communities, business & landscapes

While avoiding 5% of global emissions

Our ambitions match the scale of the problem

# WILDFIRES ENORMOUS SCALE

## GLOBALLY

**148 Million ha** of forest burned from 2001-2023

Wildfires burnt **22 Million ha in 2023 alone** including:



### GREECE 2023

Largest wildfire ever in Europe (175,000 ha)



### CHILE FEB 2024

Country's worst disaster since the 2010 Chile earthquake (270,000 ha)

### MEGAFIRES IN

US, Australia, North Africa, Turkey, Italy, Spain...



## CANADA

World's largest fires in 2023 losing **18.4 Million hectares**, or **5%** of total forests

**29 mega-fires**, each exceeding 100,000 hectares:

Canadian wildfires emitted **2.4Gt of CO<sub>2</sub>e**.

**3x**

the CO<sub>2</sub> emissions of the Canadian economy



**5x**

the CO<sub>2</sub> emissions of the global aviation industry



**85%**

the CO<sub>2</sub> emissions of India's economy



**“REDUCING CANADIAN WILDFIRES IS THE LOWEST COST OPTION GLOBALLY FOR GIGATON EMISSION REDUCTIONS”**

# WILDFIRES GROWING CHALLENGE



## Enormous Scale

**5%** Canada's forest burned in 2023 (size of WA / Florida)

**2.4 Gt** CO<sub>2</sub>e from Canada's 2023 fires (almost an India!)

**93%** burn area from lightning

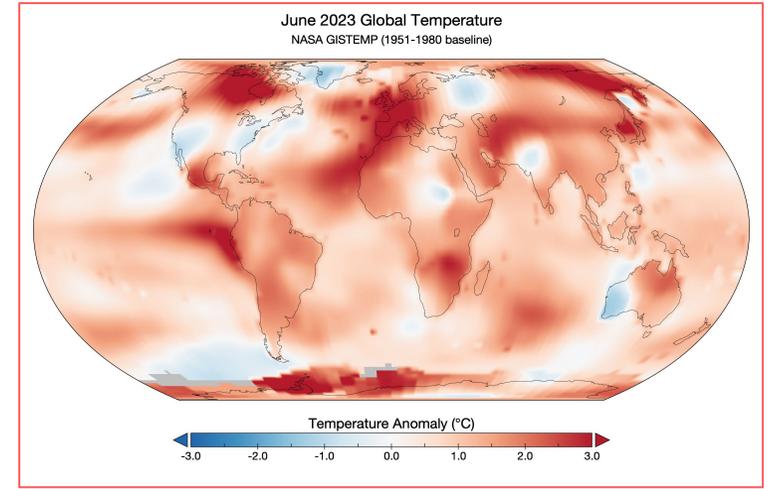


## Massive Fire Costs

**\$7B** Can/USA direct spend

**\$122B/yr** California cost

**\$394–893 Billion** US cost



## Climate Fueled

**2023** hottest year on record

**Boreal** temp rise 2X global

**2x** lightning ignition in 20 yrs

# LIGHTNING DRIVES N. AMERICAN WILDFIRES

**59%**

US/Canada wildfire ignitions

**93%**

of Canada's burned area

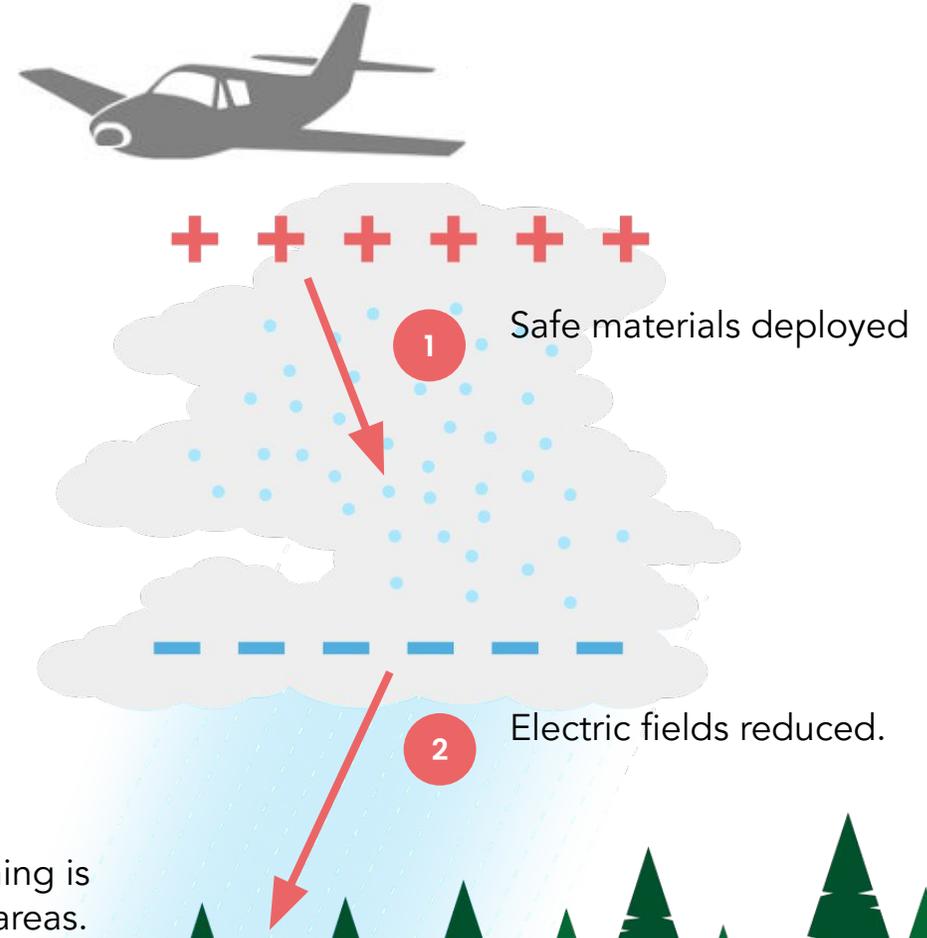
Global warming has 2-3X lightning in the North.

Lightning on just 4 days caused 30% of Canada's 2023 burn.

# SKYWARD STOPS LIGHTNING ON DEMAND

## We prevent strikes in high risk areas

- Lightning is caused by charge build-up with heavier negatively charged cloud bottoms and positively charged tops
- Cloud-to-ground strikes happen when the electric field surpasses a threshold and induces charge in the ground
- Managing the electric field below the threshold suppresses lightning



# SKYWARD AI/ML TARGETING

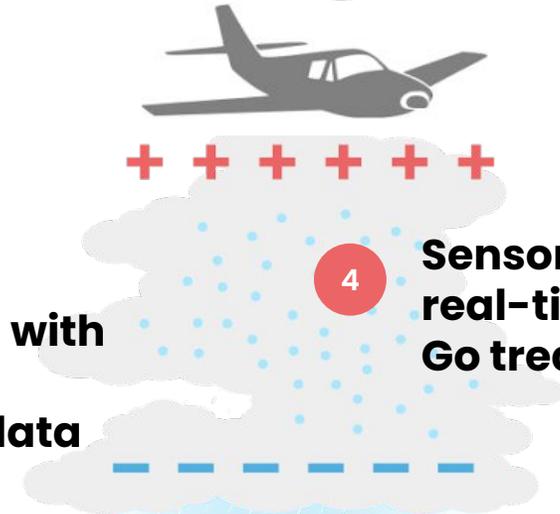


**1** Hybrid AI forecasting siting & deployment

**2** Day of: Go/No Go decision

**3** Targeting with real-time weather data

**4** Sensor enabled real-time Go/No Go treatment



## 1+ Days Ahead

- AI lightning storm forecasting model days ahead
- Predicting area & intensity for aircraft pre positioning

## Day of Treatment

- Storm growth & path model
- Flash density prediction
- Ignition & spread risk
- Go / No-go decision for flight

## AI NowCasting Model: In Flight

- Storm system treatment prioritization & flight path optimization
- Precise storm cell targeting based on structure & lightning
- Proprietary data from in-flight sensors

## Time of Treatment (at storm)

- Determine best area to treat
- Real time sensing for monitoring, reporting and verification

# SKYWARD STOPPED LIGHTNING

Skyward partnered with Alberta Wildfire in Aug 2024 to prove suppression by plane and drone. Landscape operations in Western Canada for summer 2025.

- **World's 1st** commercial lightning suppression
- **100% success** rate in active lightning storms
- **60-100% reduction** in lightning vs control cells



# SKYWARD 2025



**This summer we are partnering with British Columbia and Alberta Wildfire Services to provide landscape level solutions with more advanced aircraft, sensors, and forecasting.**





**STOPPING <1% OF LIGHTNING  
CAN PREVENT DEVASTATING WILDFIRES**



**SKYWARD**

**PREVENTING LIGHTNING ON DEMAND**

Contact: George Mason | [george@skywardwildfire.com](mailto:george@skywardwildfire.com)



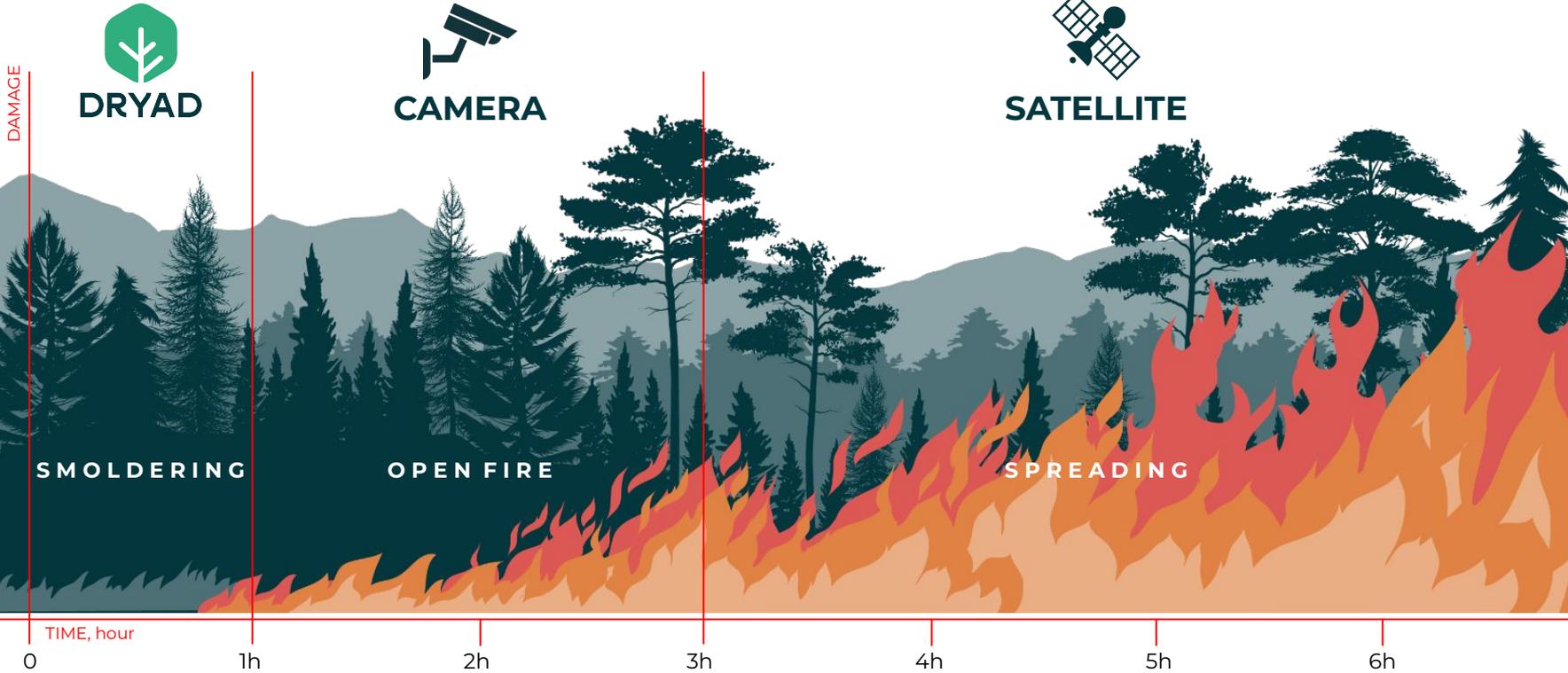
**DRYAD**  
CONNECTING THE NATURAL WORLD

# Ultra-Early **Wildfire** Detection

March 2025



# Time is of the Essence



# Unique Silvanet Sensor

Solar-powered gas sensor **'smells'** fires within minutes from ignition

- Detects fires at smoldering phase
- Runs on solar power & supercapacitors
- Low cost, high volume deployments
- 10-15-year lifespan maintenance-free
- AI powered EDGE computing
- IP67 waterproof



# Silvanet is the Internet of Trees



AI embedded in low-cost, update-ready hardware to deliver ultra early wildfire detection in a large-scale, solar-powered **network infrastructure for the forest**

## Wildfire Sensor

Solar & supercaps. **Low cost** with **10-15-year** lifespan. **AI** powered **EDGE** computing. **IP67** waterproof

## Mesh Gateway

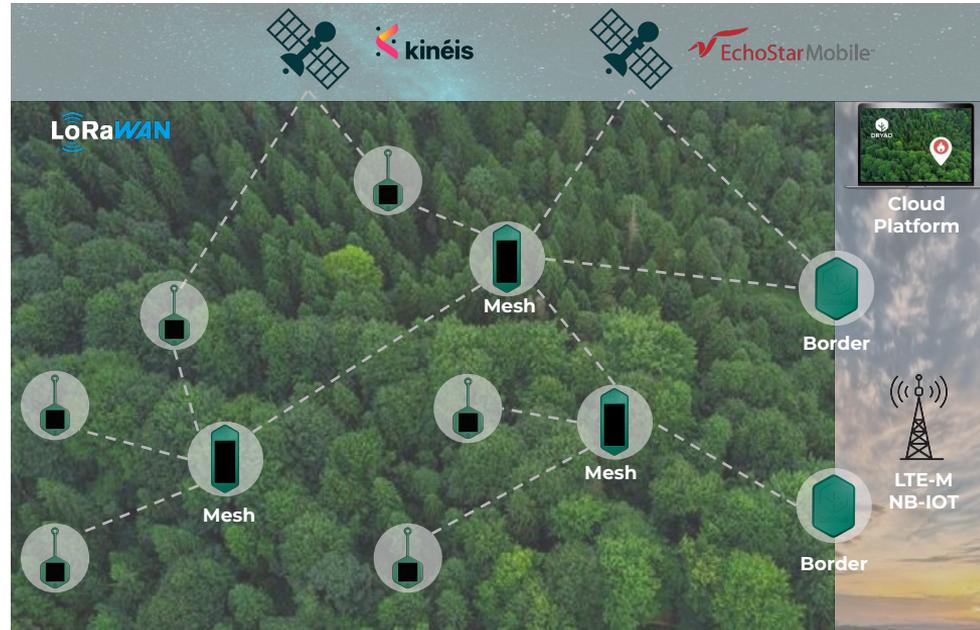
Solar & supercaps. Connect large areas with patented **LoRaWAN Mesh**

## Border Gateway

Internet connectivity for **Mesh Network**. Supports **FUOTA** firmware updates

## Cloud Platform

Web interface for monitoring, analytics, alerts, integration with **3rd-party systems**



# Go to Market



## TRACTION



**20+** active Resellers  
in EU, USA and Asia



**50+** Paid-for POC / Pilots



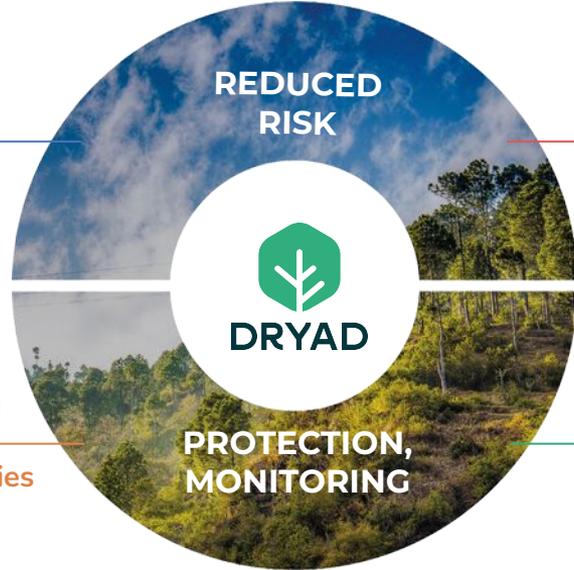
**20.000** sensors sold



Utilities



Municipalities



Insurance

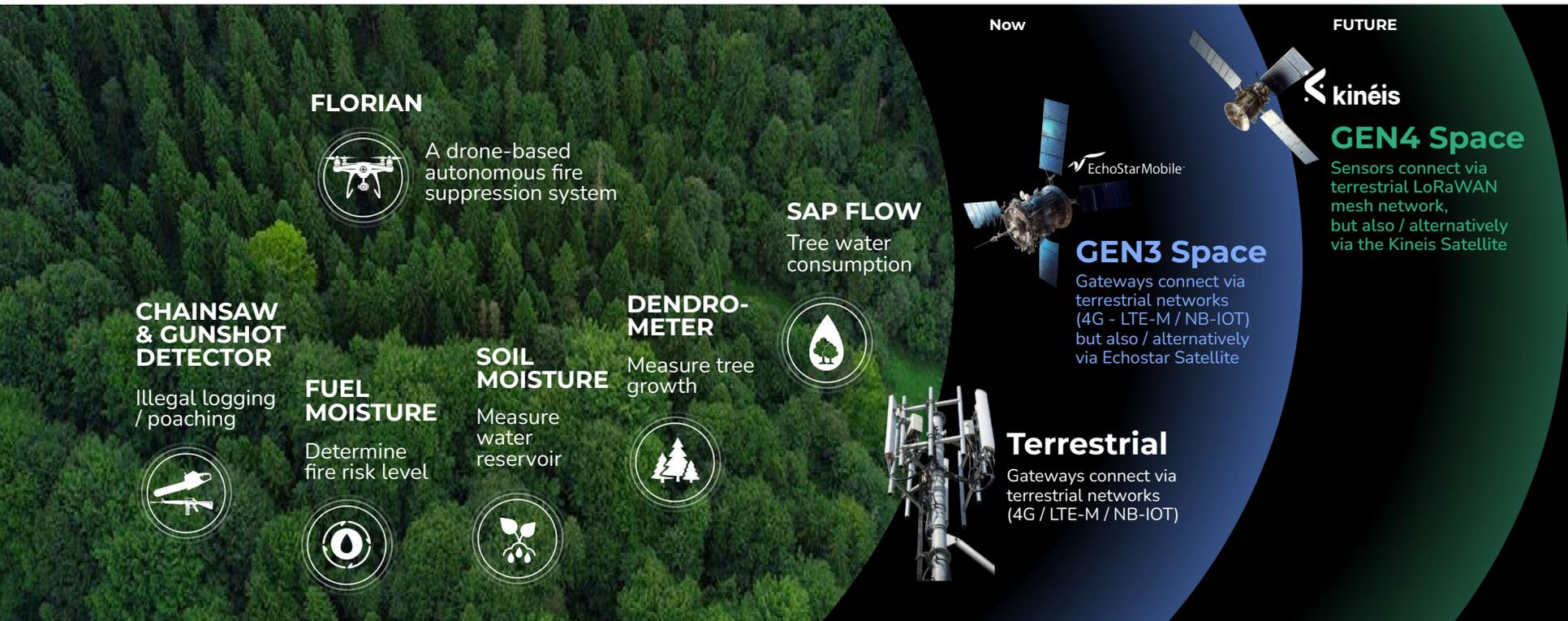


Forestry

# Roadmap: H/W in development



Dryad is building a **scalable communications infrastructure for forests and nature**, for health and growth monitoring, fire risk, illegal logging and poaching detection.





# Florian: Observation & Suppression (roadmap)

Complimenting Dryad's ultra-early wildfire detection

€3.8m EU Grant (ProFit Brandenburg)

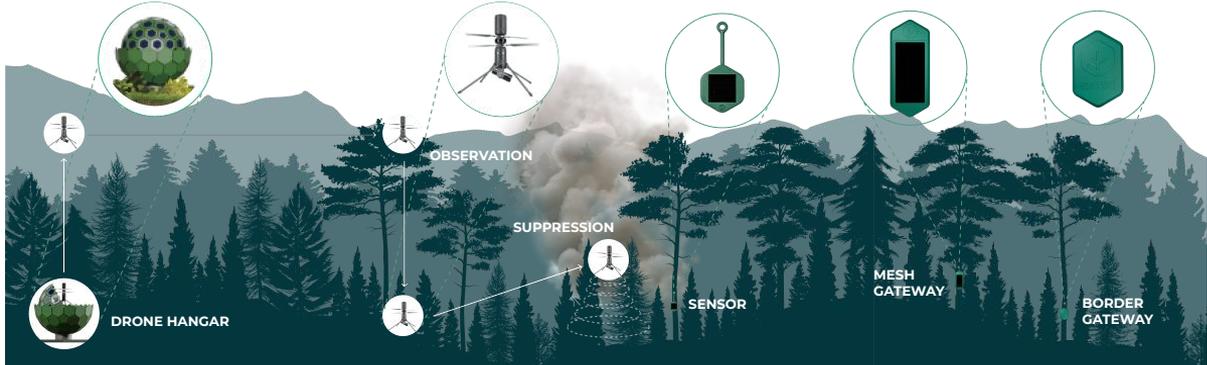
Live Demo to investors and media 27th March 2025



## Observation → Suppression

Phase 1: Solar-powered hangar and autonomous drone, detecting fire and delivering live optical and infrared video

Phase 2: Descend into forest, navigate through trees, attempt to suppress fire



### Florian's unique approach

- Fully Autonomous Operation
- Acoustic Fire Suppression
- Solar-Powered Drone Hangar
- Event Cameras for Obstacle Avoidance

# Team

## EXPERIENCED MANAGEMENT



**Carsten Brinkschulte**

CEO

Serial entrepreneur (3 exits) with 20 years experience in mobile network infrastructure. Previously Movirtu, Core Network Dynamics, 7 years running AIM-listed Synchronica



**Pedro Silva**

CTO

15 years of experience in IoT, AI, software and hardware domains. Previously INFARM, Noa Technologies and Kinematrix



**Martin Kropat**

COO

20 years experience in product management and business operations. Previously Mitte, German Autolabs, Navdy, Skully, Qualcomm, Siemens



**Luis Ferreira**

CSO

12 years experience in sales of telecommunications and cloud services. Previously Airmo, UshowMe, Iner-Cloud, Siemens



**Dr. Stephan Beyer**

CFO

15 years of Venture Capital investment experience (10 exits, 2 IPOs) plus 10 years as serial founder of H/W start-ups. Previously BigRep, nFrontier, Ventegis Capital, bmp

## STRONG TEAM

48 **diverse and passionate** team of 33 hardware & software **engineers**, 3 **operations**, 3 **sales & marketing**, 3 **admin**

## FINANCIAL & STRATEGIC INVESTORS



Brandenburg Kapital



Funded by the European Union



TIME Ventures



TELUS Pollinator Fund for Good





# DRYAD

CONNECTING THE NATURAL WORLD

BERLIN-BRANDENBURG  
GERMANY [WWW.DRYAD.NET](http://WWW.DRYAD.NET)



EUROPEAN UNION  
European Regional  
Development Fund



# THANK YOU!

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# Kodama

# Kodama:

We are a technology company focused on increasing the pace and scale of forest management.





# A Global Challenge

## Forests require active management for climate resilience



### FORESTS ARE TURNING INTO LIABILITIES

Compounding effects of forest mismanagement and climate change will lead to increase in megafire and permanent landscape conversion

33%

### COUNTRIES AREN'T MEETING THEIR GOALS

The US Forest Service is only meeting 33% of its annual forest management goals<sup>1</sup>, and other countries are even farther behind



### INCUMBENTS CAN'T SOLVE THIS PROBLEM

The forest management industry needs technology and new business models in order to meet labor, scaling, and operational challenges

<sup>1</sup>) Forest restoration data shared by California Forestry Association

# The Age of the Megafire:

**Intense**



**Drought, Overstocked Forests, and Wind Create Violent Conflagrations**

**Massive**



**Unprecedented Total Burned Area**

**Severe**

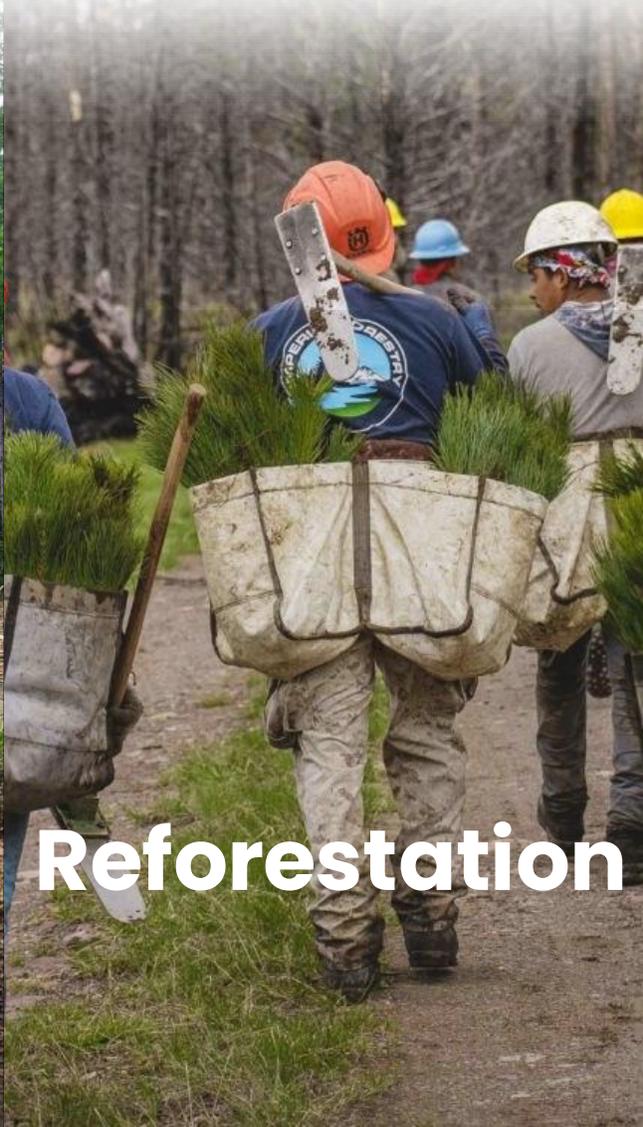


**Landscapes Left With Little Living Vegetation**

# Recovery and Prevention is Labor Intensive



Harvesting



Reforestation



Forestry



Thinning

# The Harvesting Sector

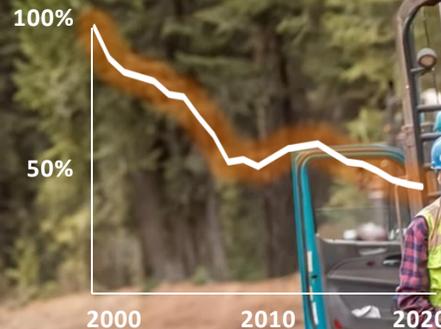
Unsung Heroes of Forest Management

Critical for Meeting Goals



Changing Dynamics

Logging Workforce



97% of American loggers state finding new employees to be "almost impossible"

Difficult, Distant, & Dangerous

Long Hours, Remote Locations, and Everyday Peril



Solution:

# SUPERVISED AUTONOMY OFF THE GRID

## Productivity Multiplier:

enables multiple machines per operator & multiple shifts

## No Travel:

Equipment operated from thousands of miles away

## Safer:

Lowers accident potential and workers' comp costs



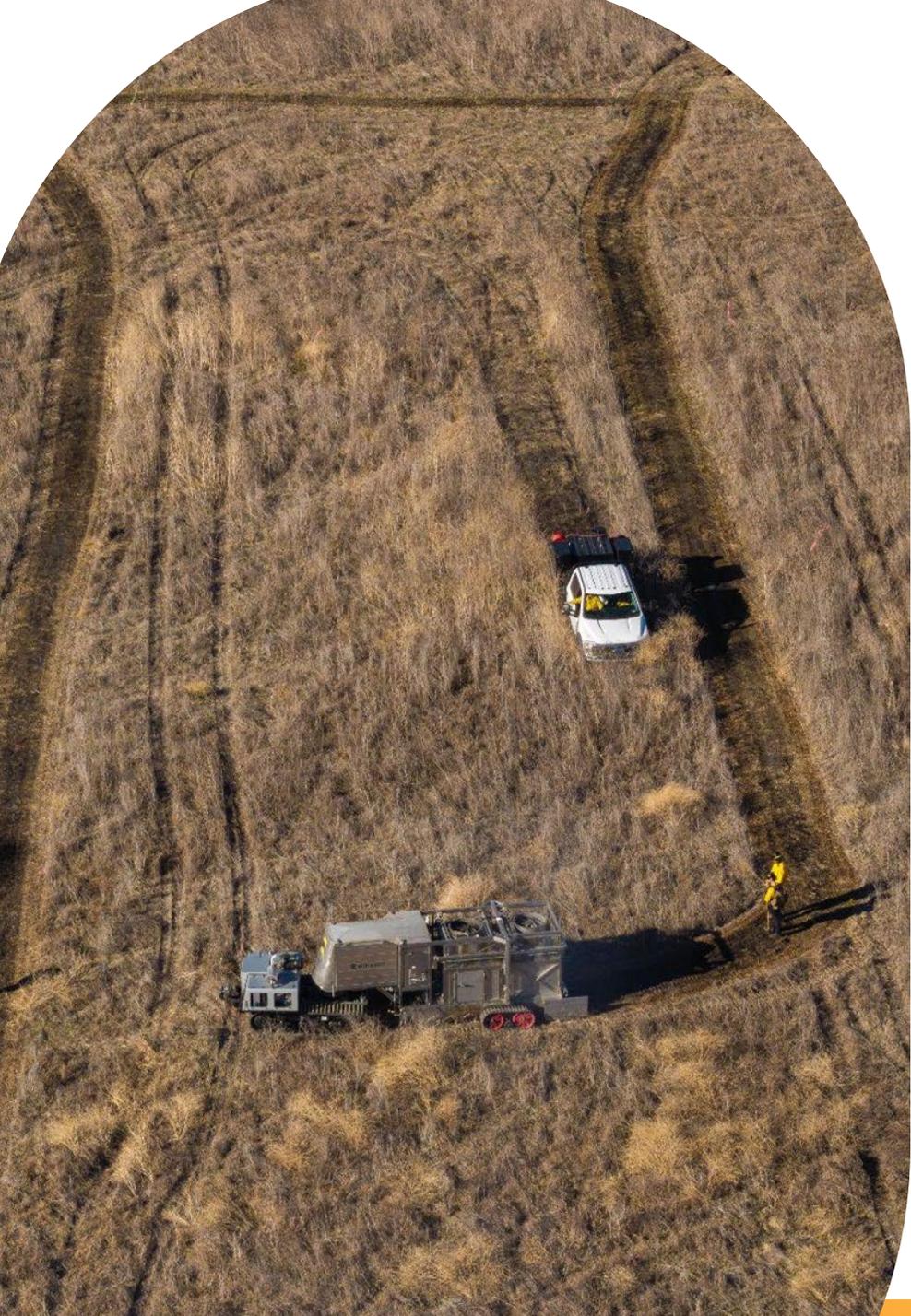
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FORESTS FOR FUTURE GENERATIONS

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# COMPANY OVERVIEW

Every acre tells a story.



# ABOUT BURNBOT



**Founded by Dr. Waleed S. Haddad and Dr. Anukool Lakhina, in 2022 with a mission to mitigate destructive wildfires.**



## **Our Mission**

We are committed to safeguarding forests and communities by blending technology with time honored forestry practices. Through collaborative partnerships, we strive to create a resilient, fire-adapted future.



## **Our Vision**

A world where technology and tradition unite to make destructive wildfires a rarity, empowering communities and nurturing fire-resilient landscapes.



## **Our Services**

Comprehensive fuels management solutions tailored to diverse landscapes.

- RX Controlled Blackline
- Remote Mastication Teams
- Forestry and Logging Services



## **Our Focus**

- Emphasis on sustainable practices in wild fire prevention
- Strong focus on workforce development
- Committed to creating safer, more resilient communities
- Collaborative approach, working with local, state and federal agencies
- The Right Tool, The Right Time, The Right Acre



## **Strategically located throughout the Western United States:**

- **HQ:** South San Francisco
- **CA:** Placerville, Redding, San Bernardino
- **NV:** Reno
- **OR:** Medford

# BURNBOT'S APPROACH TO FUELS REDUCTION



## Our Commitment

Balancing wild fire prevention with ecological preservation for safer, healthier landscapes.

### Gentle on Ground Methodology

- Minimizes ecological impact
- Preserves soil health and native vegetation
- Reduces erosion control and habitat disruption
- Maintains natural landscape aesthetics

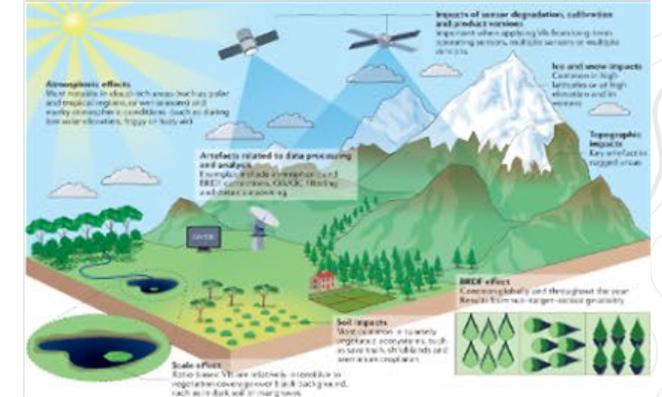
### Embracing "Good Fire"

- Promotes native species growth
- Helps control invasive species
- Improves habitat for wildlife
- Stimulates germination for fire-adapted species
- Helps control certain pests and diseases
- Can increase water yield in watershed by reducing overall vegetation density
- Promotes a more natural carbon cycle

### Fusing Tradition with Technology

- Increased efficiency allowing the treatment of more acres
- Optimize treatments and minimize collateral impacts to non-targeted areas
- Improved Safety
- Reduce costs by more efficient resource allocation
- Better data collection and analysis for long-term planning
- Adaptability to diverse and custom landscapes
- The Right Tool, The Right Time, The Right Acre

# BURNBOT'S APPROACH TO FUELS REDUCTION



**Analyze & Prioritize**  
Use advanced modeling to identify high-risk fuel location, generate a cost-benefit analysis and prioritize treatment areas for maximum impact

**Engage & Treat**  
Partner with local communities and agencies to implement strategic fuel treatments using innovative technologies

**Monitor & Maintain**  
Track treatment effectiveness and provide data-driven recommendations for long-term maintenance

# REDUCING WILDFIRE RISK



**A 3-acre fuel break** as a buffer for structures in direction of wind on steep slopes.



**10-acre fire buffer “virtually eliminates” fire risk**, while creating a shelter island for fire crews.



**95-acre treatment**, removing fire debris, reducing losses to once every 100 years.

# PROVEN TO BE EFFICIENT & ECO-FRIENDLY



Fortify Infrastructure



Protect Property



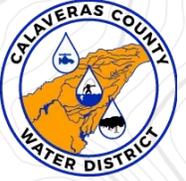
Safeguard Habitats



CSAA Insurance Group,  
a AAA Insurer



Upper Mokelumne River  
Watershed Authority



# WHY FUELS MANAGEMENT IS CRUCIAL FOR LANDOWNERS

## Property Protection & Personal Safety

- Reduces risk of property damage or loss from wild fires
- Helps maintain or increase property value
- Creates defensible space around structures
- Improves evacuation potential in case of wild fires

## Insurance Benefits

- May lower insurance premiums or improve insurability
- Some insurers require fuels management for coverage in high-risk areas

## Long-term Cost Savings

- Prevention is often less costly than post-fire restoration
- Reduces potential for erosion and other post-fire problems
- Helps avoid potential fines or legal issues



## Community Responsibility

- Reduces fire risk for neighboring properties and the broader community
- Demonstrates good land stewardship

## Ecosystem Health

- Promotes healthier, more resilient forests and landscapes
- Supports biodiversity and wildlife habitats
- Potential for sustainable timber harvesting or other forest products
- May increase land productivity for agriculture and grazing
- Helps landscapes adapt to changing climate conditions
- Reduces vulnerability to increasingly severe wild fire seasons

# ALL-IN-ONE FUELS MANAGEMENT PARTNER



BurnBot brings the right tool for the right acres at the right time to treat fuels



## REMOTE-OPERATED MASTICATORS

Precision mulching & mastication. 55-degree slope, up to 10" dbh, rubber tracks, low decibel, lightweight with minimal ground disturbance.



## CONTROLLED BURNING RX MACHINES

Ground-based precision burning with minimal smoke; 6' tall flashy fine fuels, 5' wide blacklines in single pass, up to 30-degree slopes, 22" ground clearance.



## SKILLED TECHNICIANS

Wildland firefighters, with fire & fuels expertise, trained on our technology stack.

# REMOTE MASTICATOR



BurnBot's Remote Mastication Teams (RMTs) deliver precision fuels reduction through advanced remote-controlled units like the FAE RCU-75, capable of operating on slopes up to 55° while maintaining ultra-low ground pressure. This technology enables a single operator to safely and efficiently treat challenging terrain from a distance, significantly reducing labor costs while protecting retained vegetation and minimizing environmental impact. By accessing areas traditional equipment cannot reach, RMTs provide superior production rates and treatment quality for large-scale fuels reduction projects.

<b>Model</b>	FAE RCU -75	<b>Operating Weight</b>	7,716 lbs
<b>Type</b>	Remote Controlled	<b>Transport Weight</b>	7,275 lbs
<b>Engine</b>	Caterpillar C2.8	<b>Clearance</b>	12.6 in
<b>Power</b>	Diesel, HP: 74	<b>Max Speed</b>	3.7 mph
<b>Max Torque</b>	325 Nm @ 1600 RPM	<b>Max Slope</b>	55° / 142%
<b>Tracks</b>	Steel or Rubber	<b>Working Width</b>	52 in
<b>Length</b>	134 in	<b>Cutting Capacity</b>	Up to 8 in diameter
<b>Width</b>	60.6 in	<b>Noise Level</b>	95 dB(A)
<b>Height</b>	63 in	<b>Emission</b>	EPA Tier 4 Final

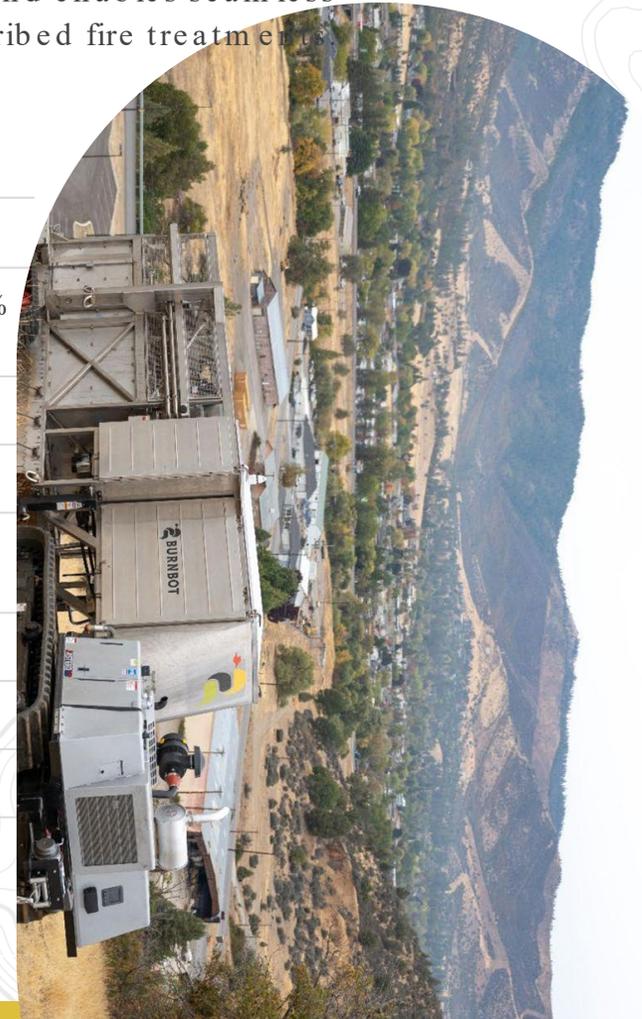


# RX REMOTE-BLACKLINE MACHINE



BurnBot's RX remote-controlled blackline machine transforms prescribed burning operations by expanding burn windows and enabling precise fire patterns in variable conditions. This advanced technology delivers firing operations 3-4x faster than traditional hand firing while maintaining exceptional control and predictability. By streamlining complex burns through automated grid patterns and efficient operation, the RX2 frees up experienced fire personnel for other critical roles and enables seamless cooperation between private and agency crews, significantly increasing the pace and scale of prescribed fire treatments.

<b>Length</b>	28.5 ft	A self-contained burn chamber allows for higher wind speed tolerances (up to 20 mph)
<b>Width</b>	8.5 ft	Can perform burns in light rain/high humidity
<b>Height</b>	8 ft	Operates on slopes perpendicular up to 30° / 58% and side slopes up to 20° / 36% (contingent on soil conditions)
		Ground clearance of 22" to handle uneven terrain
		Can handle flashy fine fuels up to 9 feet high
		Early testing indicates the RX is effective at eradicating seed banks in high fire danger areas containing invasive plant species.
		Nearly zero smoke emissions eliminating the need for air quality burn permits
		Little to no ember cast or escape risk
		Can operate in the WUI and within 5 feet of structures
		Capable of efficiently burning fuels that aren't fully cured, providing exceptional flexibility in fuel options while maintaining optimal performance and consistent output



# Forest Fire Decision Support System

Decision Support System for the Prediction of Fire Behavior and Suppression of Forest Fires



# Who is Başarsoft



- GIS Based Solutions And Systems Since 1997.
- 300+ Experts / CMMI Level 3 / e-Turquality / Official R&D Centre.
- Solutions Used in More Than 15 Countries in 4 Continents.

## Our Partnerships



Infrastructure Solutions



Geographical BI Solutions



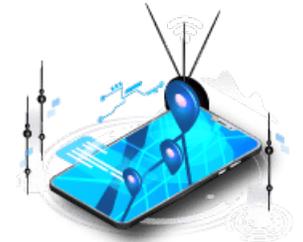
Map Data



GIS and RS Solutions



Google Products



Mobile Applications



Optimization Services and Registration on Maps



Field Workforce and Indoor Navigation

# • Fire Spread Model & Simulation



- Custom designed model for Türkiye, derived from USA and Canada models by consultants
- Various Data and Integrations
- Forest Fire Algorithm
- Fire Simulation Module
- AI based Intervention and Workforce management
- Risk Assessment Maps
- Benefits of system (existing and planned)

INTEGRATIONS	WEB APPLICATION		MOBILE APPLICATION
OGM Orbis	Map Display	3D Visualization	Online/Offline
OGM Meus	Fire Spread Module	Fire Intervention Module	Map Module
OGM IHA	Detection Of Fire Start Cause Module	Fire Extinguishing Module	Basic Fir Spread Simulation
ATS	Authorization and Logging	Fire Evacuation Module	Route To Fire/ Data Entry
Other Institutions	Workload Module	Training And Exercise Module	Nearby Locations



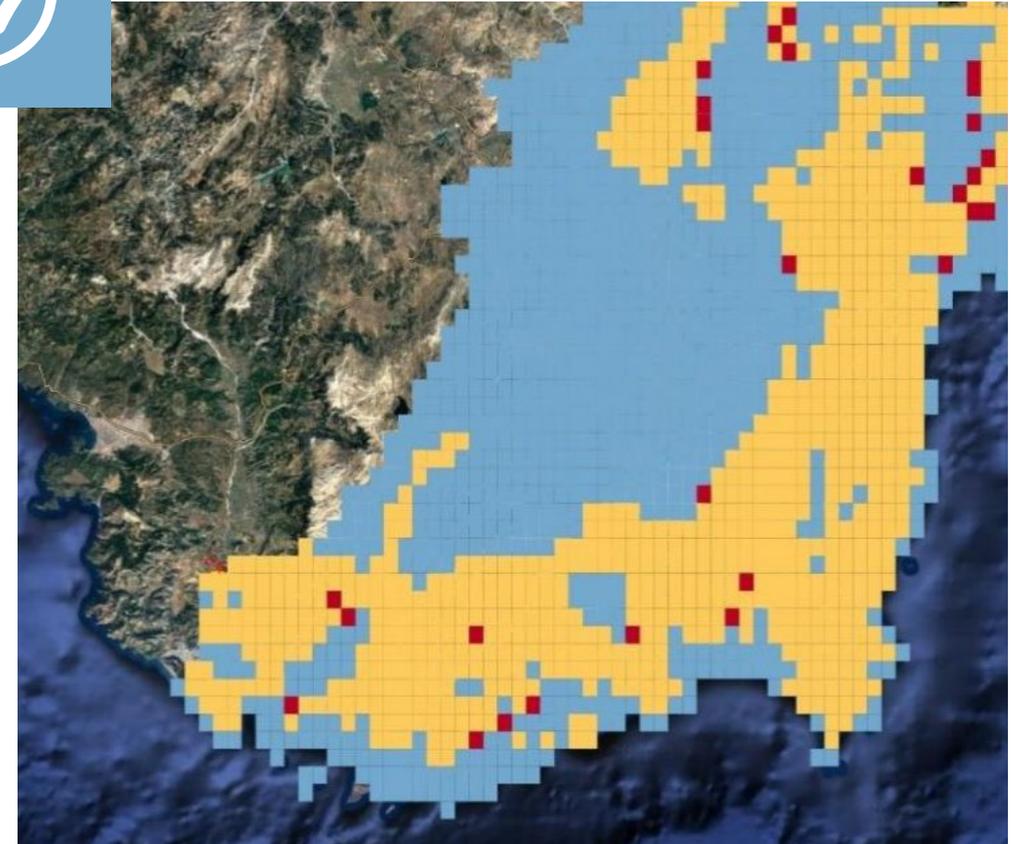
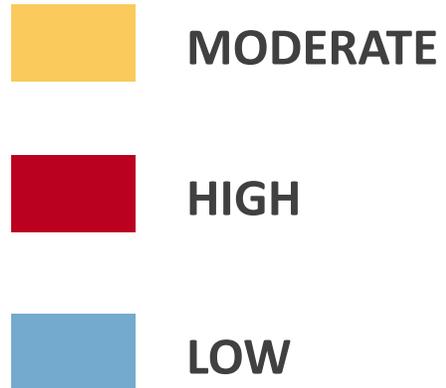
# AI Based Intervention And Workforce Management



The screenshot displays a software interface for fire intervention management. At the top, there is a header with a logo, a search bar, and various status indicators including temperature (35°), date (5/27/2025), time (16:08), duration (13 MINUTE), and area (1,738 Ha). A 'Fire Intervention Screen' window is open, showing icons for different types of fire-fighting equipment: truck, car, airplane, helicopter, tractor, and a fire source icon. Below this, the 'WORKLOAD ANALYSIS SCREEN' is visible, featuring a 'Run' button and a table of team codes and their distances from the nearest water sources.

Team Code	Type	Distance ↓
35A59	Arazözler	47.77 Km
48A16	Arazözler	43.14 Km
48A39	Arazözler	35.8 Km
48A22	Arazözler	34.72 Km
48A11	Arazözler	25.41 Km

Forest Fire Risk Based on Meteorological Conditions & Forestry Inventory Attributes



# Benefits Of The System



AI based intervention suggestions and the amount of necessary staff.

Work force assignment with web and mobile applications.

Simulate how the fire spread based on Meteorology or Organizational Expertise.

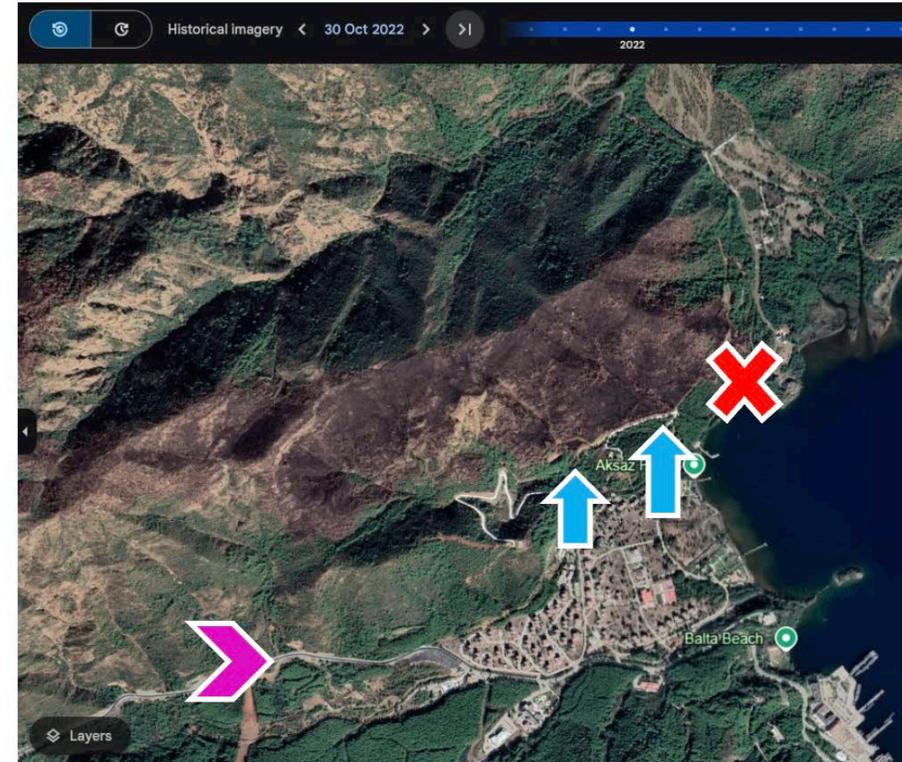
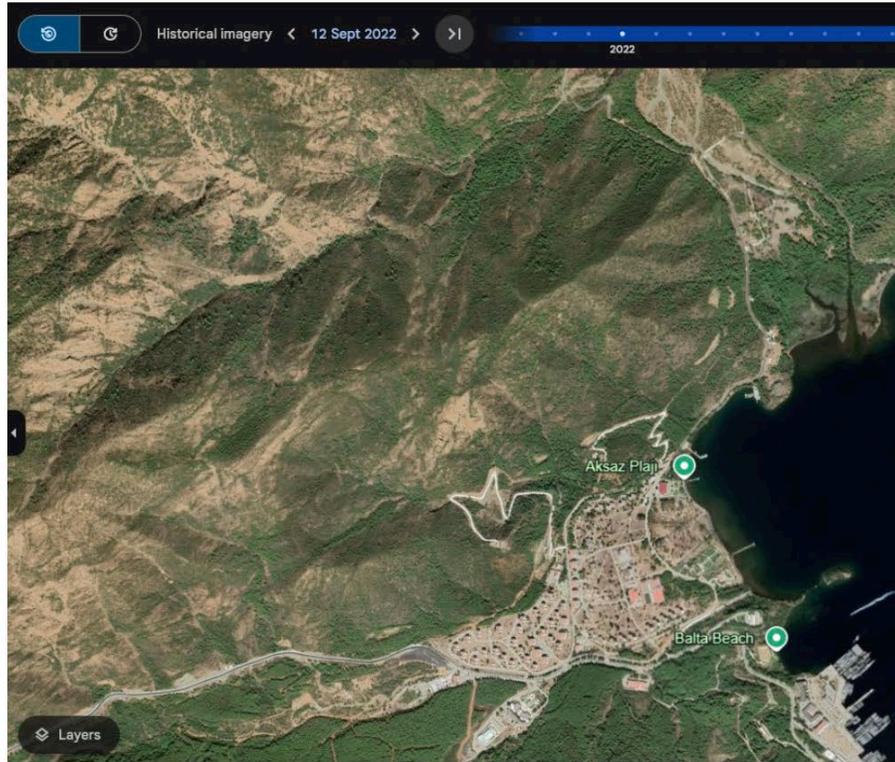
Re-Modelling with Near Real Time UAV /Drone Imagery.

Re-Modelling according to interventions made/not made in ongoing fire. In Office (Web App) or From Field (Mobile App)

**Real Case:** Çanakkale / Merkez / Kızılkeçili  
16.07.2023 One of the Major Fires. After simulation, precautions were taken at the location where the fire will reach in 3 hours.

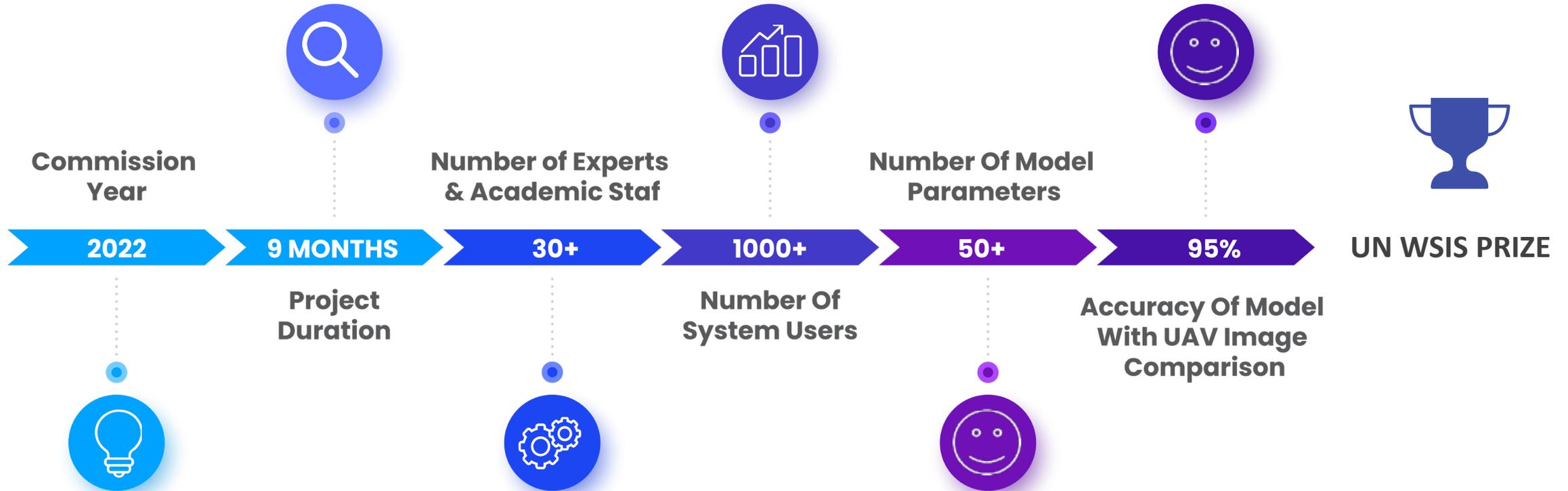
**Real Case:** Military Base, Limited Access Area.

# Real Case: Military Naval Base Fire



Real case: 2022 fire, Military Naval Base, Limited Access, made with system, precautions were taken at the location where the fire will reach in 3 hours.

# About The Project



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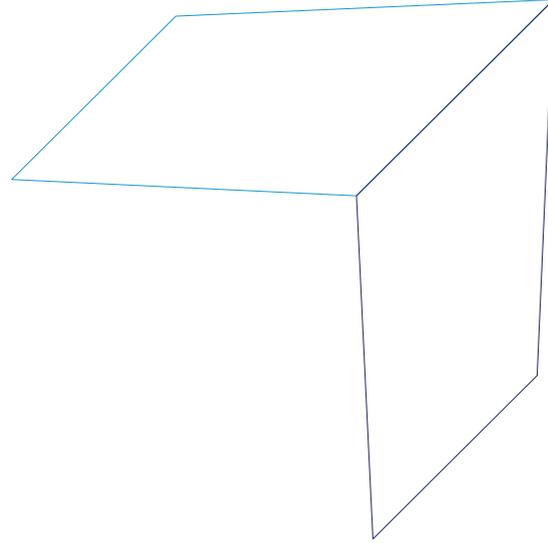
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# Thank You



**Basarsoft** is always with you for the efficiency of your business and customer satisfaction!



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WILDFIRE



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TECHNOLOGY ADVANCEMENTS  
FOR INTEGRATED FIRE  
MANAGEMENT



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**KEV MARRIOTT**  
**XPRIZE**



**Multi \$M GLOBAL PRIZE  
COMPETITIONS TO SOLVE  
THE GRAND CHALLENGES OF  
OUR TIME**

**We BELIEVE SOLUTIONS TO  
THE WORLD'S PROBLEMS  
CAN COME FROM ANYONE,  
ANYWHERE**



THE PRIZE THAT STARTED IT ALL

# THE ANSARI XPRIZE

The \$10 million Ansari XPRIZE was designed to lower the risk and cost of going to space by incentivizing the creation of a reliable, reusable, privately financed, crewed spaceship that finally made private space travel commercially viable.

26 teams entered the competition, with \$200M invested in pursuit of the \$10M grand prize. On October 3, 2004, a team led by Burt Rutan and Paul Allen were the first to reach space twice in 14 days.

The winning technology was then licensed to Richard Branson and Virgin Galactic, creating the now \$3B space tourism industry.





**XPRIZE  
WILDFIRE**



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XPRIZE Wildfire is a 4-year, \$11 million competition incentivizing the innovation of firefighting technologies that will **end destructive wildfires so that humanity and beneficial wildfire can safely co-exist**. The prize aims to transform current wildfire management approaches through the development of new technologies that can rapidly and accurately detect, characterize, and respond to wildfires before they become destructive.

## ACROSS TWO COMPLIMENTARY TRACKS

- Track A: Space-Based Wildfire Detection & Intelligence
- Track B: Autonomous Wildfire Response



XPRIZE  
WILDFIRE



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*Pacific Gas and  
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NAVARINO

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COMMITTED INDIVIDUAL BENEFICIARIES



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**NICK  
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Tribal Affairs Secretary, Office of  
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Paul Steblein



Justin Whitesell



Erik Litzenberg



Luiz Motta



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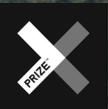
Paul Petersen



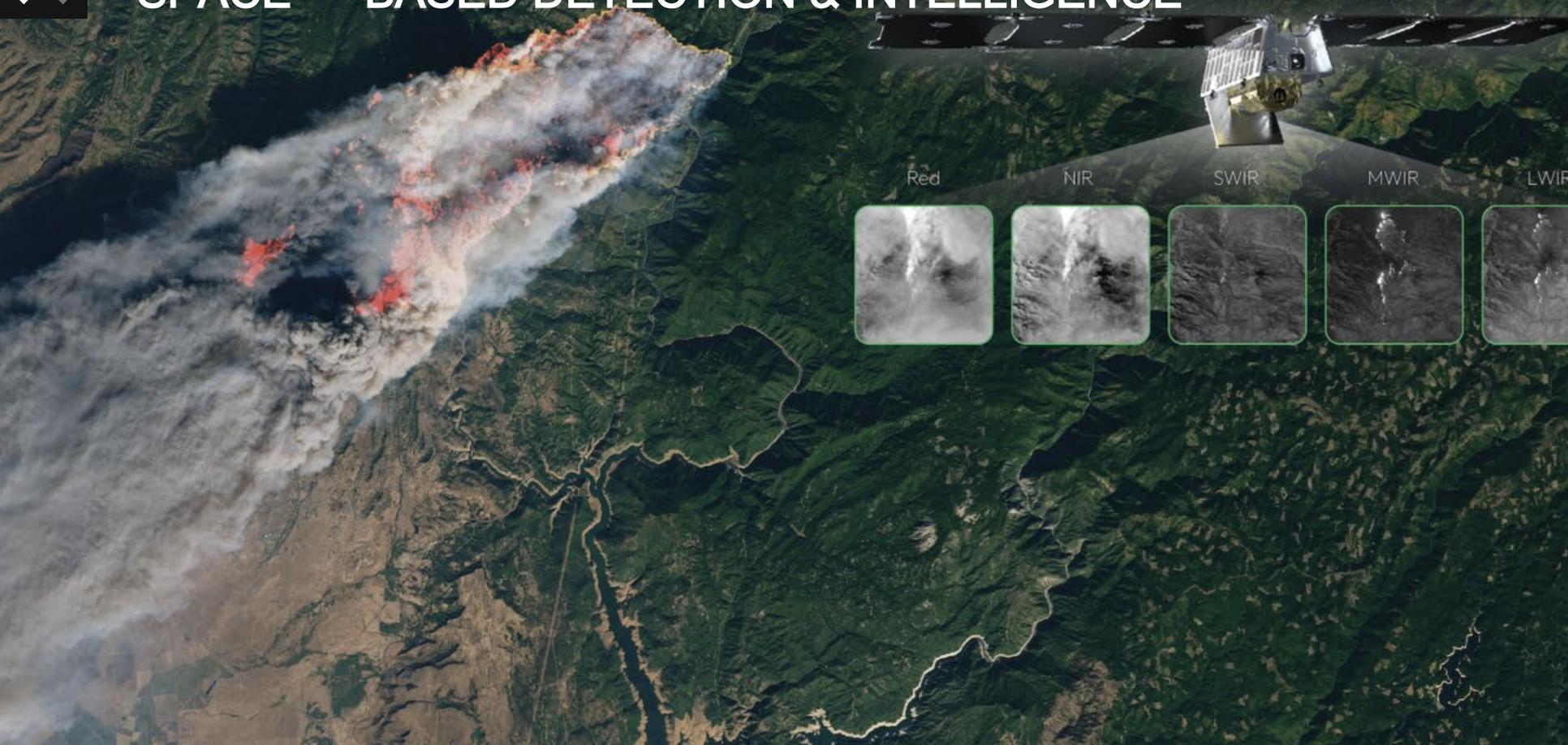
Rhys Wilson



Marta Yebra



# TRACK A SPACE - BASED DETECTION & INTELLIGENCE



Red NIR SWIR MWIR LWIR

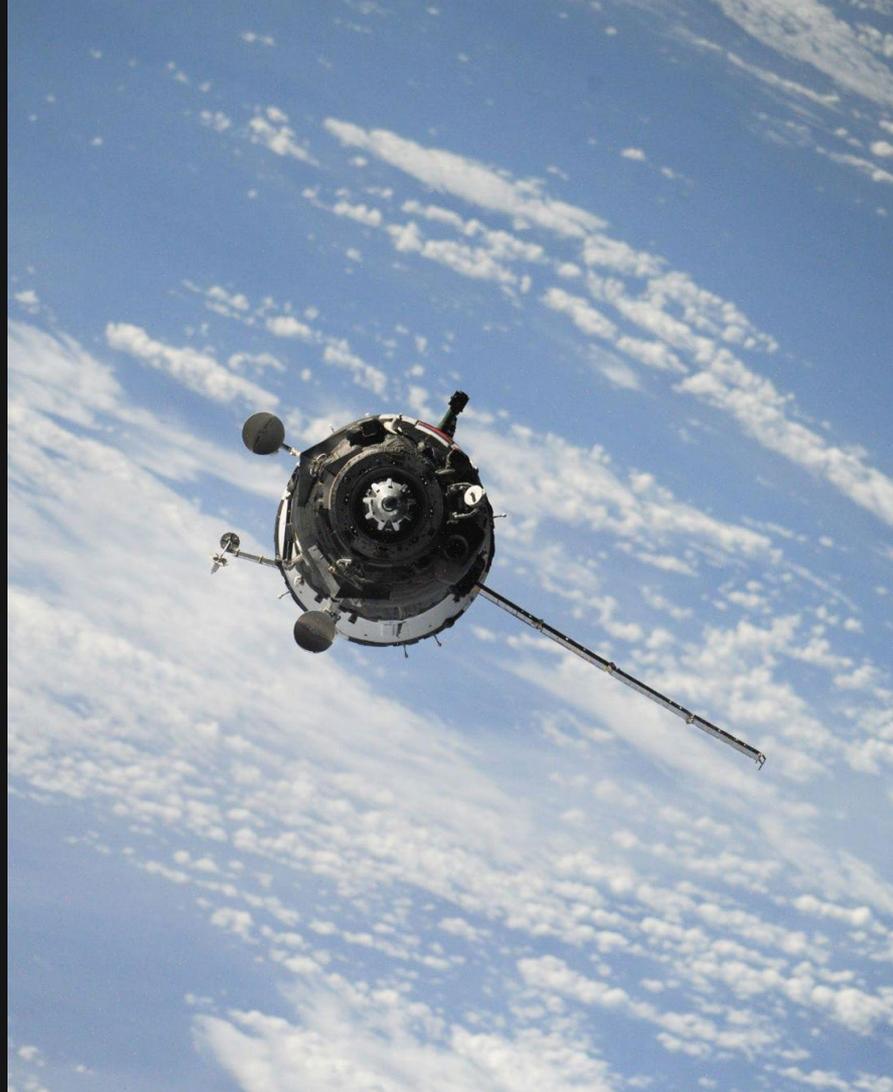
Five satellite sensor data panels showing different spectral bands: Red, NIR, SWIR, MWIR, and LWIR. Each panel shows a grayscale image of the volcanic eruption area, with the SWIR panel showing the most detail and contrast.



# XPRIZE WILDFIRE

## Track A: Space Based Detection & Intelligence

Teams have **one minute** to accurately detect **all fires** across a landscape larger than entire states or countries, and **10 minutes** to precisely characterize and report data with the least false positives to decision-makers on the ground.





# TRACK B AUTONOMOUS DETECTION & SUPPRESSION





# XPRIZE WILDFIRE

## Track B: Autonomous Wildfire Response

Teams have 10 minutes to autonomously detect and suppress a high-risk fire in a 1,000 km<sup>2</sup>, environmentally challenging area, leaving any decoy fires untouched.

XPRIZE





# CORE PROBLEMS

- Time
- Accessibility
- Detection Accuracy & Precision
- Extreme Weather Operation
- Siloed Industry





# SOLUTIONS IN DEVELOPMENT

- Improve accuracy and precision of detection from ground and space
- Provide rapid and actionable Intelligence to fire managers
- Introduce autonomous solutions to firefighting
- End-to-end solutions for rapid detection - suppression



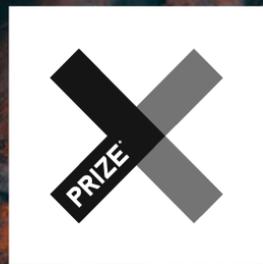


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QUESTIONS?



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THANK YOU