# aem

EBOOK



# Building a Wildfire Monitoring, Detection, & Collaboration Intelligence Hub





# Facing the community wildfire threat together

The uptick in major wildfires over the last half-decade has created new challenges for public safety and infrastructure protection professionals from the American west to the Australian outback.

More community and business leaders have a role to play in minimizing the impact of wildfires than any of us would've imagined a few years ago.

This guide is designed to help forestry, emergency management, local government, and energy utility leaders understand their growing role in the field of

wildfire risk management and response. Our goal is to provide you with actionable guidance that you can use to improve safety in your community, protect precious natural resources, and maintain normalcy in the face of escalating fire risk.

We'll start by exploring how the challenge of wildfires has evolved in recent years and then transition toward looking at how municipalities, land management agencies, and utility providers can build powerful solutions at scale through the example of a model community.

# The scope of the wildfire challenge

# Major wildfires are growing across the world.

Over 62.000.000 acres have burned in the U.S. alone since 2015 in more than 480.000 individual fires. That's more than a 20 percent increase in acres burned over the previous seven-year term in spite of the fact that there were about 15% more fires between 2007 and 2015 as there have been since then.

What does that mean? Fires are getting bigger and more destructive. They're quickly growing into one of the major challenges of our time.

U.S. Wildfires



Fires aren't just "big" though; the human side of the challenge is equally important - if not more so.



Souce: National Interagency Fire Center (NIFC)

Migrations toward the exurbs and the continual sprawl of the world's major cities both mean human life and infrastructure are increasingly a presence in traditional wildlands, stretching the area of wildland-urban interface (WUI) where fires can escalate quickly in terms of both financial damage and impact on the ecosystem.



# Why the WUI?!

Why are fires in the wildlandurban interface at especially high risk for escalation?

#### THE WUI PACKS A UNIQUE BLEND OF:

- Fuel (trees, dry vegetation, buildings, residential-use combustibles)
- Utility infrastructure (high-tension towers, major gas pipelines, energy generation equipment)
- Remote locations where a small fire can grow undetected
- Significant logistical barriers to delivering equipment and coordinating a response



# Understanding the wildfire event cycle

Just a few years ago, forestry and fire safety professionals focused on "wildfire season," the period in the late summer and early fall where regions across North America waxed and waned in fire risk. To tackle the challenge of creeping season and the crisis of major wildfires, USDA Forestry Service professionals now embrace the concept of the "fire year."

Given that fires don't keep calendars, it can be even more powerful to look beyond the concept of seasons or months and consider the full lifecycle of fires, fire risk, and fire resiliency:



Being ready for wildfires requires strong intelligence-gathering and communication capabilities.

- Enable hyperlocal fire danger rating
- Build a network of sharable wildfire intelligence data

### Detection

Identifying a potential ignition quickly can be the difference between mitigation and disaster.

- Visualize the field in real-time
- Know where to look based on lightning and weather data



#### **Recovery and Rehabilitation**

After a fire has ended, its impact on the community and landscape can linger for years.

Prevention

Data-driven land management

and fuel reduction efforts must

grow to reflect the true scope of

Assess and prioritize
prescribed burn areas

the challenge.

- Study event data to understand the path forward
- Monitor areas of increased flood risk proactively

#### Response

Once a fire is detected, providing the right intelligence to and from the field is essential to timely mitigation.

- Monitor conditions throughout an event
- Provide a foundation of data for decision making







# Our vision for wildfire resiliency

## Dry Pines, CA: imagining a wildfire-ready community

For the sake of illustration, let's imagine the community of Dry Pines, California.

Located on the eastern side of the Central Valley, not far from Redding, Dry Pines is a growing community of about 200,000. Much of the area has been developed in the last 20 years. Deer and coyotes still occasionally wander downtown. The surrounding natural beauty is what attracted most residents to the area.

The wildlands to the east of Dry Pines are known as Dry Pines State Forest, which is managed by the state Department of Forestry and Fire. There was a close call in 2021, when wind carried the Fawn Fire toward Dry Pines, but the weather changed, and a crisis was averted.

Dry Pines' largest employer is I-5 Energy, an investor-owned utility that provides power to many customers in Northern California and Oregon. They operate a hydroelectric generation plant on the nearby Bluff River and manage a network of local power stations that supply energy to the city's business and residential developments. In recent years, they've had to offset their rising insurance costs by increasing rates for citizens in the greater Dry Pines area, which has been an unpopular move.

In light of the recent area fires, the City of Dry Pines, I-5 Energy, and the Department of Forestry and Fire have all committed to fireproofing their community both because it's the right thing to do and because it's essential to protecting their shared interests.

#### CHALLENGES

- Intersection of wildland, residential developments, and utility infrastructure
- Operating in an area known for large fires in recent years
- Ensuring the community feels safe for citizens and businesses
- Protecting beloved natural resources
- Keeping energy affordable

#### COMMUNITY STAKEHOLDERS

- City and county governments
- State forestry service
- Areautility provider
- Area citizens

## Transforming the field





Weather stations are placed throughout the greater Dry Pines area to provide localized intelligence for the region. Additional mobile stations can also be deployed rapidly at high-interest for temporary or ad hoc monitoring campaigns.

Together, that network of stations can provide both a generalized and a hyperlocal view of weather and associated fire risks across a wide territory.

Wildfire cameras are also placed throughout the service territory, with emphasis on maximizing strategic viewpoints of high-importance areas. Those cameras automate the job of the traditional fire watch professional, eliminating the need for anybody to be high up in a tower in a potentially dangerous location - and also preventing staffing from being a barrier to overall fire intel. All that visual and data-powered intelligence is sent back to a single, highly visual software interface that creates a true wildfire intelligence hub.



**Compact Automated** Weather Station



**Fixed Remote Automated** Weather Station (RAWS)

Lightning Sensor







## The intelligence hub

The intelligence hub is a dedicated and powerful space for fire weather intelligence, field monitoring, threat detection, and response coordination-but that doesn't mean it has to be some big control room like in an action movie. The intelligence hub could even be a single desktop computer or tablet used by a single reviewer. What makes it a true hub is the clarity, power, and actionability of the information that flows to the user.





Users have access to a 24/7real-time dashboard that pulls fire weather intelligence and field visualization data into a single, powerful view for monitoring. Weather and environmental data from the field provide a granular, richly mapped understanding of fire risk across their territory.



To automate wildfire monitoring and focus on other responsibilities as needed, the user can set notifications that let them know when fire risk is especially high or when lightning storms are entering their territory and striking near high-interest areas.



With just a few clicks of the mouse, the user can review intelligently curated images from the nearest camera in the field to assess the potential impact zone visually and determined whether or not a fire has started.



Once they've detected an ignition, the user can communicate with a risk assessment or fire mitigation team, providing exact coordinates for the incident area and an exportable report with all available intelligence on the fire.



The user can also continually monitor a fire throughout a mitigation effort to provide strategic intelligence to crew on the ground and serve as a spotter/advance notice for additional incoming risks.

to their fire weather network.



## The new normal for Dry Pines

While local leaders and citizens in Dry Pines alike know that the threat of a wildfire isn't going anywhere, they can all rest a little easier knowing their community has the best chance yet to detect and mitigate a wildfire before it escalates into a major event thanks

Now, Dry Pines is poised to continue growing.



The area's major employer, I-5 Energy, is able to reduce their insurance costs by demonstrating their wildfire-readiness, allowing them to pass savings along to end customers and add jobs. By increasing their ability to protect infrastructure and communicate with other agencies throughout the community about potential fire risks, they've created a framework for maximum service and business continuity.



The beloved Dry Pines Forest can be better monitored than ever, even in the face of a staffing shortage. The forestry professionals who protect the wildland can collaborate quickly and more effectively than ever with fire service agencies to investigate and mitigate potential ignitions. That means more resilience in the face of the next big fire.



Everyday citizens in the area feel more secure and better protected. They see the value the leaders of their community are providing. They're reassured that the wildlands and city they love are in the hands of fire-ready stewards, and they're excited that increased wildfire preparedness could lower their electric bill.



The city's government is taking steps to strengthen their local wildfirereadiness, enabling more powerful collaboration with state and federal agencies, leading to better outcomes. In this way, Dry Pines has emerged as a model community within the region, attracting additional residents and businesses with the promise of security.

# How to build your own wildfire intelligence hub

If you're in local government, land management, or the utilities space, you can easily replicate the Dry Pines, CA success story at scale - either on your own or in collaboration with other stakeholders in your area. All you need to get started is an understanding of your current challenges and a partner who can help you design a wildfire intelligence hub that's aligned with your needs and goals.

At AEM, we specifically help communities build powerful wildfire intelligence hubs at scale using



#### (+)FIRE WEATHER MONITORING NETWORKS

We can help you map, implement, and roll out a monitoring network using your hardware or sensors from our portfolio of brands.

## + FIRE WATCH CAMERAS

We can connect you with leading fire watch cameras with 360-degree point-tilt-zoom capabilities to modernize and accelerate wildfire monitoring rapidly.

### (+) WILDFIRE RISK MANAGEMENT SOFTWARE

Our software solution is a comprehensive wildfire risk management solution that can turn any professional at a desk into a one-person intelligence hub.

AEM is proud to partner with utility providers, municipal governments, and land management agencies across the globe to improve community wildfire resilience, protect infrastructure, and preserve both natural resources and human life. While Dry Pines might not be a real place you can find on the map, it represents a microcosm of the driving challenges we see our customers facing and a vision for the transformation we know we can help communities bring about.

Our purpose is to empower communities and organizations to survive - and thrive - in the face of escalating environmental risks. If you've got a community or business that's feeling the heat of wildfires, or just wants to be prepared in the face of a growing crisis, it's time to sit down with AEM and start a conversation about scaling a fire monitoring network and intelligence hub to your area.

#### ADDRESS

AEM Germantown, MD 20876

CONTACT

We would love to hear from you! Please fill out our form and we'll be in touch.

12410 Milestone Center Dr., Suite 300

