



EBOOK

Global Wildfire Challenge

A Rising Crisis with a Satellite Response



In recent years, the frequency, scale, and destructiveness of wildfires have surged dramatically across the globe. Once considered seasonal and largely regional phenomena, wildfires are now a year-round, transcontinental crisis. From the scorched Mediterranean coastlines to the vast forests of North America, wildfires are pushing emergency response systems to their breaking points.

Areas burned by forest fires increased by about 5.4 percent between 2001 and 2023¹, with forest fires now resulting in nearly 6 million more hectares of tree cover loss per year than they did in 2001, an area roughly the size of Croatia.

This mounting challenge is not simply about the fires themselves but about their cascading impact on already strained resources, exhausted personnel, and outdated infrastructure. As governments and fire services shift to respond, the capacity to contain, manage, and recover from wildfires is being tested like never before.





Central and Southern Europe: Strained Systems Amid a Surge in Wildfires

The Mediterranean basin has long experienced wildfires, but the intensity and duration of recent fire seasons in central and southern Europe mark a worrying shift. Record-breaking heatwaves, prolonged droughts, and strong winds have contributed to fires spreading faster and longer than ever before. Countries like Greece, Italy, Portugal, and Croatia have faced fires engulfing hundreds of thousands of hectares, destroying villages, ecosystems, and economies.

The summer of 2023 marked a devastating year in the Mediterranean basin, with 334,000 acres of land burned in southern Europe in just 12 days after fires began in mid-July². Large wildfires in Algeria and Tunisia were deadly and required evacuations. In Greece in 2024, June and July became the hottest on record, with a fire breaking out on August 12 and swiftly burning 100,000 acres of land.

Firefighters are often outmatched. In many European countries, firefighting services are municipally owned or volunteer-based, lacking the full-time resources to combat mega-fires. The rapid escalation of fire events means local responders frequently require reinforcement from national or even international teams, leading to delays and coordination challenges. Equipment, especially aerial firefighting resources like helicopters and water bombers, is often in short supply or shared between regions, creating logistical bottlenecks.

Aging infrastructure and limited investment in fire prevention compound the issue. Many rural areas lack proper firebreaks, updated evaluation plans, or accessible roads. This increasing urban encroachment into forest areas adds another layer of complexity, putting more lives and homes in harm's way while forcing fire services to divide their efforts between protecting human settlements and combating the advancing flames.

Spain: A Country on the Defensive

Spain has emerged as one of the hardest-hit countries in Europe, with wildfires becoming a relentless summer ordeal. In 2022 alone, Spain accounted for nearly 40 percent of all wildfire-affected land in the European Union, burning over 300,000 hectares³. The challenge is multifaceted: not only are the fires growing in scale, but Spain's geography and demographics exacerbate the crisis.

Vast, arid landscapes are highly combustible during the summer months, while rural communities' depopulation means fewer eyes on the ground to spot and report fires early. Often organized by regional governments, firefighters in Spain report being under-resourced and overstretched⁴.

The intensity of recent fire seasons has revealed cracks in the response system. Mutual aid agreements between regions are strained when all areas are simultaneously impacted. Aircraft fleets are aging, and calls for more investment in preventative measures, such as controlled burns, forest thinning, and community preparedness programs, have outpaced actual policy action. In response, the Spanish government has increased its budget for firefighting in recent years, but implementation often lags behind the urgency of the situation.





North America: Capacity at the Breaking Point

Across North America, wildfires have become larger, destructive, and unpredictable. The western United States and Canada are facing some of the most extreme fire seasons on record, with smoke from blazes regularly blanketing entire regions and even crossing international borders. The vastness of the terrain, coupled with hotter, drier, and windier conditions, makes firefighting efforts incredibly complex.

Federal and state firefighting agencies are grappling with escalating costs and dwindling personnel. Since 2011, the dollars allocated to wildfire suppression have exceeded \$1 billion annually, spiking to a high of \$4 billion⁵.

But even with increased spending, the system is buckling. Fire seasons now span multiple months, requiring a year-round workforce that many agencies aren't equipped to maintain.

Urban sprawl into wildfire-prone areas, particularly in California and British Columbia, adds to the challenge. Protecting lives and property in these regions requires extensive coordination between local, state, and federal agencies – coordination that can falter under the pressure of back-to-back disasters.

The Role of Satellite Connectivity in Firefighting Response

As fire seasons grow more severe and widespread, firefighting crews increasingly operate in remote, infrastructure-poor areas where traditional networks break down. Satellite connectivity is becoming essential to bridge these communication gaps, delivering real-time data, location tracking, and emergency messaging when terrestrial systems are compromised or unavailable.

One-way satellite communication devices offer a resilient lifeline for firefighters on the ground. These tools allow personnel to send location pings, environmental readings, or status updates anywhere in the field. This connectivity enables command centers to monitor crew positions, coordinate evacuations, and respond to dynamic fire behavior, especially when cellular coverage is unreliable.

Together, satellite connectivity and devices offer a crucial backbone for modern wildfire response by delivering the reliability, reach, and resilience that today's conditions demand. In a landscape where seconds count and terrain is unpredictable, satellite technology is helping fire services adapt, respond, and stay connected when it matters most.



Why Satellite Connectivity Outperforms Cellular in Firefighting Scenarios

When it comes to wildfire response, connectivity is not just a convenience; it's a lifeline. Yet traditional cellular networks often fall short in the environments where firefighters operate. Remote forests, mountainous terrain, and rural fire-prone regions typically lack sufficient cellular infrastructure. Even when coverage exists, it is vulnerable to failure during fire events, where high temperatures, power outages, and infrastructure damage can bring cellular towers offline. In contrast, satellite connectivity offers reliability, reach, and resilience that cellular simply cannot match.

Satellite systems operate independently of ground-based infrastructure, making them ideal for dynamic and unpredictable environments. Whether crews are dispatched deep into national parks or navigating rapidly expanding fire lines, satellite-enabled devices maintain uninterrupted communication. This is particularly critical for transmitting location data, requesting backup, or issuing emergency alerts when every second counts.

Another key advantage is scalability. Cellular networks may become congested in high-traffic emergency zones, especially when residents and responders attempt to communicate simultaneously. Satellite networks bypass this limitation, providing consistent performance regardless of local congestion.

Moreover, satellite devices are often built for rugged use and designed with durability and a long battery life to withstand harsh conditions. Many are compact and easy to deploy, requiring no setup or reliance on existing infrastructure.



Quick Look

Cellular vs. Satellite Communications in Wildfire Response

FEATURE	CELLULAR	SATELLITE
Coverage	— Limited in rural / wildland areas	+ Global, including remote and infrastructure
Infrastructure Dependence	— Requires functioning towers and local power	+ Limited terrestrial infrastructure
Reliability During Fires	— Vulnerable to outages, congestion, and damage	+ Maintains connectivity even during disasters
Deployment Speed	— Slow in remote buildouts	+ Instant access with portable devices
Congestion in Emergencies	— High: especially near urban-wildland interfaces	+ Low: dedicated bandwidth for emergency services
Device Durability	— Varies, not optimized for extreme environments	+ Designed for rugged, field-based use
Use Case Suitability	— Urban/suburban pre-fire planning	+ Real-time ops, remote coordination, crew tracking

Verdict: Satellite connectivity offers unmatched resilience and reach when firefighters need it most, making it a mission-critical solution for modern wildfire response.

Satellite Connectivity: More Viable Than Ever for Firefighting Teams

For years, satellite communication was viewed as a niche solution – reliable but expensive, complex, and limited to high-end or military-grade deployments. Today, that perception has shifted dramatically. Thanks to advances in technology and changes in the connectivity landscape, satellite has emerged as a far more viable, accessible, and mission-ready tool for modern firefighting.



Cost-Efficiency Has Dramatically Improved

The expansion of low-cost satellite constellations, improvements in bandwidth allocation, and the deployment of simpler, lightweight hardware have driven prices down. Fire agencies no longer need to invest in bulky satellite phones or dedicated terminals that cost thousands of dollars. Today's satellite messaging devices are compact, rugged, and affordable.



Usability Has Evolved

Modern satellite devices are designed for field teams, not engineers. With one-touch SOS functions, automatic location tracking, and easy-to-use mobile apps, satellite connectivity no longer requires specialized training. Many devices operate with minimal setup and can run on a single charge for days, making them ideal for long deployments in remote environments.



Integration Is Now Seamless

Today's satellite solutions can plug directly into existing platforms ranging from command center dashboards to asset tracking software. APIs allow satellite-enabled data to feed into broader IoT ecosystems, giving agencies a holistic view of team locations, fire spread, and equipment status in real time. Firefighting units can layer satellite connectivity on top of terrestrial systems for redundancy, ensuring mission continuity when primary networks fail.

As wildfires grow more complex and frequent, fire services can't afford communication gaps. Satellite offers the reach, reliability, and now the affordability needed to keep teams connected, informed, and safe no matter where the fire takes them. With scalable pricing, user-friendly tools, and integration-ready tech, satellite has transformed from a premium luxury into a practical necessity.

Key Differentiators to Look for in Satellite

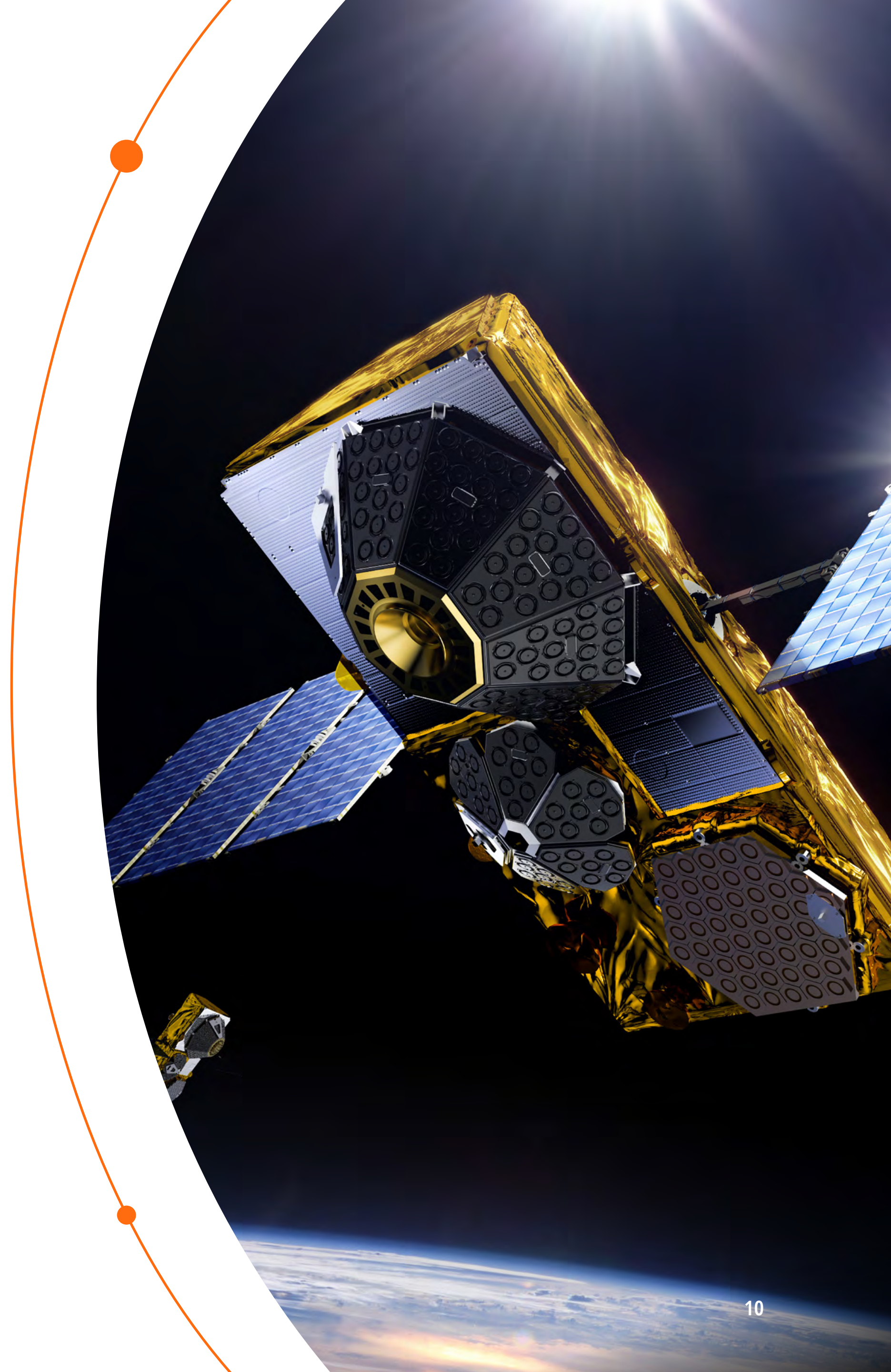
Satellite is growing as a highly viable option, which has created a market opportunity for providers. Modern satellite solutions must be cost-effective, easy to use, and seamless to integrate into existing firefighting workflows to be the actual asset they can be. It's essential to look at the options that deliver on the key benefits of satellite connectivity:

✓ Compact Design for Mobility and Versatility

Firefighters are already carrying heavy packs, PPE, water gear, and specialized equipment. Satellite communication devices must be compact, lightweight, and easy to attach to belts, vests, or helmets without disrupting mobility. Devices with a small form factor are more likely to be integrated into standard wildfire gear, increasing the likelihood that they're used consistently and correctly in the field. In high-stress environments where every movement counts, form factor can directly impact safety and effectiveness.

✓ Global Coverage That Follows the Fire

Fires don't care about infrastructure, and they often erupt in areas far beyond the reach of cellular networks. Devices that operate on Low Earth Orbit (LEO) satellite constellations offer a distinct advantage by enabling near real-time communication from anywhere on the planet. For fire crews working across expansive wilderness, mountainous terrain, or in countries with limited terrestrial infrastructure, global satellite coverage ensures they can transmit critical data and distress signals, regardless of geography or infrastructure damage.



✓ Platform-Agnostic Integration for Faster Deployment

Fire agencies operate under a patchwork of regional, state, and federal systems, each with its own protocols, software, and command structures. Platform-agnostic satellite devices can integrate into existing incident management tools, mapping platforms, or personnel tracking dashboards without requiring time-consuming system overhauls. This flexibility reduces friction and accelerates adoption, allowing command centers to gain visibility across dispersed teams without duplicating systems or retaining crews mid-season.



✓ Low Power Consumption for Field Durability

Wildfire response is often a multi-day or multi-week operation in power-scarce environments. Devices with low power requirements are crucial, allowing firefighters to stay connected without the need for constant charging or bulky backup batteries. Many newer satellite messengers and trackers are optimized for extended use, with battery lives that span days or even weeks. This ensures continuous connectivity for crew check-ins, location updates, and emergency communications even in prolonged deployments.

✓ Operational Continuity and Safety You Can Rely On

Taken together, these differentiators do more than improve device performance; they support operational continuity, situational awareness, and firefighter safety. Compact, power-efficient, globally connected, and integrable satellite devices help incident commanders maintain contact with dispersed crews, monitor movement in real time, and respond rapidly to threats or distress signals.

For agencies investing in wildfire readiness, these capabilities aren't luxuries – they're essential. Selecting a satellite communication solution that meets these criteria can be the difference between coordinated control and critical communication failure in the moments that matter most.

Case Study

INFOCA Equips 5,000+ Firefighters with Satellite-Enabled Safety and Wildfire Modeling Tools

In Spain's southernmost region of Andalusia, climate conditions influenced by the nearby Sahara Desert contribute to one of Europe's most volatile wildfire environments. The region's rugged terrain, soaring temperatures, and growing tourism present ongoing risks for both communities and emergency responders. At the heart of its wildfire defense is INFOCA, Andalusia's regional fire authority and one of the largest firefighting organizations in Europe, with more than 5,000 active personnel.

To meet the escalating demands of wildfire response, INFOCA partnered with fire technology specialist Technosylva to deploy a comprehensive incident management and field coordination platform. At the core of this system is Wildfire Analyst™, Technosylva's predictive fire modeling software, paired with fiResponse™, an operational management tool used by command centers to monitor fire crews and optimize resource allocation.

What makes this system especially effective is its integration with Globalstar's SPOT satellite devices, which enable accurate real-time tracking of firefighters even far beyond the limits of terrestrial networks.

INFOCA uses both Globalstar's SPOT Gen3 and SPOT Gen4, rugged GPS messengers that send location data to the fiResponse interface and include an SOS feature that can alert headquarters at the push of a button.

This integrated solution dramatically improves situational awareness, enabling INFOCA to see where each firefighter is on the map in near real-time and respond quickly if conditions change or a crew member signals distress. The Low Earth Orbit (LEO) satellite network behind SPOT ensures that even when cellular infrastructure is down or absent, communications remain intact – a vital benefit in disaster conditions where every second counts.

INFOCA's adoption of this technology began with a rapid deployment during the COVID-19 pandemic to support public safety efforts, including the disinfection of public areas. Recognizing the system's value, the agency expanded its usage and, by 2022, had deployed 550 SPOT Gen4 devices. Neighbor Castilla La Mancha followed suit, having begun its own deployment of SPOT as early as 2015.

INFOCA's success reflects a broader international trend. Fire agencies across the United States, Canada, and Latin America have also adopted Technosylva's platforms, supported by Globalstar satellite devices, to enhance field coordination and resource management.

This case illustrates how data-driven platforms and reliable off-grid connectivity together create a force multiplier, allowing fire authorities to act faster, smarter, and more safely in the face of increasingly unpredictable wildfires.

The Digital Impact at a Glance

INFOCA's deployment of satellite-enabled fire management technology improves decision-making, field coordination, and responder safety in one of Europe's most wildfire-prone regions.

The collaboration between Globalstar and Technosylva enables:

- ✓ **Real-time situational awareness:** GPS-tracked SPOT devices deliver constant visibility of personnel, even in GSM-denied areas.
- ✓ **Faster emergency response:** One-touch SOS alerts enable rapid dispatch of support to exact firefighter locations.
- ✓ **Smarter resource allocation:** Predictive fire modeling helps prioritize assets and anticipate fire behavior under changing conditions.



Closing the Gap: Connectivity That Meets the Moment

As wildfire seasons intensify and response teams are stretched further into remote and unpredictable environments, traditional communication systems are proving insufficient. Satellite technology is no longer just a backup; it's a critical part of modern firefighting infrastructure. From real-time crew tracking to emergency alerts and long-range situational awareness, resilient connectivity has become the foundation of safe, coordinated, and effective wildfire response.

Here's How Globalstar Can Help

At Globalstar, we deliver the tools and network capabilities needed to support firefighting operations in even the most demanding conditions through:

- Compact, rugged satellite devices purpose-built for frontline use
- Global LEO network coverage for uninterrupted communication even beyond the grid
- Low-power, long-lasting hardware ideal for extended field deployments
- Affordable devices and connectivity to support operations and safety
- Platform-agnostic integration for seamless deployment across agencies and workflows
- Finished IoT and tracking solutions to support personnel and command visibility

Whether you're equipping a regional fire crew or supporting a multi-agency wildfire response, Globalstar provides reliable, cost-effective, and scalable solutions to help you stay connected when it matters most.





Ready to strengthen your wildfire response strategy?

[Schedule a meeting](#) with a Globalstar expert today.

1. <https://www.wri.org/insights/global-trends-forest-fires>
2. <https://www.bbc.com/future/article/20230803-wildfires-the-changing-face-of-the-mediterranean-landscape>
3. <https://english.elpais.com/international/2023-08-20/wildfire-on-spains-popular-tourist-island-of-tenerife-was-started-deliberately-official-says.html>
4. <https://tinyurl.com/3abd4xws>
5. <https://fas.org/publication/fy25-wildfire-budget/>