



# Wildfire Technology

While Pulaskis and chainsaws are tried and true tools of wildfire, technology is not new to fire suppression and mitigation – think about weather forecasting and satellite imagery. However, legislators today are presented with tantalizing new tools that promise to alter the wildfire landscape but also come with price tags and other issues.

In recent reports, the U.S. Government Accountability Office (GAO) highlights current and emerging technologies that have the potential to save lives and property by improving wildfire forecasting, detection, mitigation, and response.

The GAO identifies the following key points regarding wildfire technology:

## Wildfire Detection Technologies – Three Main Groups

- **Satellites:** While used for decades to track fire speed and direction, satellites were not originally designed for detection. They often face data lags and resolution issues that make it difficult to spot small fires. A [private nonprofit launched a pilot satellite](#) specifically for detecting wildfires in 2025, with goals to provide better resolution and faster data using AI algorithms to spot fires, with 50 satellites targeted for orbit by 2030
- **Aircraft and Drones:** These are used to collect information on a fire's location and spread. Drones offer a safety advantage by removing pilots from hazardous conditions, but they face flight range limitations and safety concerns regarding crashes in heavy smoke.

- **Ground-Based Networks:** Cameras and air sensors can monitor smoke or fire in real time. However, installation and data transmission are challenging in remote areas, and sensors often require dense networks to be accurate.

### **Artificial Intelligence (AI) and Machine Learning**

The GAO notes that machine learning is being applied to natural hazard modeling to improve forecasting accuracy and warning times.

- **Benefits:** AI can speed up data assimilation, allowing models to update forecasts with current observations faster than traditional mathematical models. It can also create synthetic data to fill gaps where real-world data is insufficient.
- **Challenges:** The use of AI is hampered by a lack of sufficient data from rural areas to train models. Additionally, significant up-front work and cost are required to make existing data usable by AI tools.

### **Policy and Management Challenges**

The GAO outlines several open questions and systemic barriers to technological adoption:

- **Data Compatibility:** Public and private wildfire detection data are often not easily integrated, which hinders quick response efforts. Also, there are questions about the sheer amount of data collected and how to manage that.
- **Privacy and Security:** The use of cameras and drones near residential areas raises significant privacy and data security concerns.
- **Cost Balancing:** A major challenge is determining how to balance the costs of detection technology with other essential fire prevention actions, such as manual vegetation clearing and suppression. Policy makers across jurisdictional boundaries also must consider how those costs are shared,

### **Policy Options**

- Expand the use of existing observational data and infrastructure to close data gaps
- Establish guidelines for making data readily usable by AI
- Updating education requirements to include coursework related to machine learning (ML)
- Considering what combination of detection technologies would be most cost-effective
- Evaluate how the costs of technologies could be balanced with other fire management actions.

Sources:

[Science & Tech Spotlight: Wildfire Detection Technologies](#), GAO

[WILDFIRE MANAGEMENT -- Technologies for Forecasting, Detection, Mitigation, and Response](#), GAO

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