

# THINK LIKE A FIRE SCIENTIST

**WILDFIRES** are a natural part of many ecosystems. They help recycle nutrients, clear out dead plants, and make room for new growth. But when a forest hasn't burned in a long time, a buildup of dry material makes wildfires burn hotter and spread faster. These bigger, hotter wildfires can wipe out whole forests, destroy wildlife habitat and even threaten our communities. Fire scientists manage the risk of destructive wildfires that threaten forests, wildlife, air quality and homes.



**AIR QUALITY SENSORS** help people monitor outdoor air for health risks.

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**ROBOTIC VEHICLES** like drones and rovers are equipped with sensors that measure factors like temperature, humidity, and air quality—data that help scientists and land managers determine the right time for prescribed burning.



The Montana **SMART FIRES** project brings together researchers and community leaders to better understand wildfires. By using advanced technology and studying forest conditions, fire behavior, and smoke impacts, the team helps prevent dangerous wildfires and protect people, wildlife, and the land.

### **Fire Science Team**

This team of scientists studies how fires start, spread, and behave. They examine influences like weather, plant types, and how much **fuel** (dry material like leaves and branches) is on the ground. Sometimes, they use a **prescribed burn**—a small, carefully planned and managed fire that safely clears out fuel. This helps prevent bigger wildfires and keeps forests and grasslands healthy by making space for new growth.

### **Artificial Intelligence and Machine Learning Team**

This team of **computer scientists** uses **artificial intelligence** (AI) and **machine learning** (ML) to study fire and smoke. AI helps computers solve problems more like humans, but much faster, and ML teaches them to find patterns in data. The team uses these tools to predict where smoke will go and how fires might behave, so land managers can make smarter, faster decisions to protect people and nature.

### **Smart Optical Sensors Team**

This team of **engineers** is developing **sensors**—tools that detect changes in the environment, like heat, smoke, or light. Some sensors are placed on a **rover** that rolls across the ground, and others fly on **drones** to monitor fire activity from above. AI helps these sensors quickly process data and send useful information to scientists. With this technology, firefighters and land managers can respond quicker and more safely to wildfires.

### **Social Psychology, Economics, and Ethics Team**

This team of **social scientists** studies how people make decisions about fire and smoke, especially from prescribed burns. They look at how trusted information—like news, advice from experts, or computer predictions—can help people take steps to protect themselves, such as by using air purifiers or staying indoors. The team also explores why some people respond differently to smoke and how to make sure everyone has the tools and knowledge to stay safe.

## **What do you think?**

Describe how smoky air makes you feel or affects your daily life.

**Which of these four teams would you be most interested in joining, and why?**

**If you could invent a tool to help detect or manage wildfires, what would you name it, and what would it do? Draw it here.**



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**SMART FIRES**

This material is based upon work supported in part by the National Science Foundation EPSCoR Cooperative Agreement OIA-2148653. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.