



Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Rocky Mountain Research Station | 2025

Wildfire Risk Management Science Team at a glance

The Wildfire Risk Management Science Team leverages our innovative research into decision support tools for firefighters and fire planners tackling wildfire challenges.

Rocky Mountain Research Station's Wildfire Risk Management Science Team develops tools for wildland fire managers. Our cutting-edge technology, backed by state-of-the-art science informs decisions made by fire managers every day. For two decades, the Wildfire Risk Management Science Team has been investigating critical facets of the wildfire response system and creating decision-making support tools for fire planners and incident command teams. Our Team provides real-time data on risk management, fire response strategy, and likely effectiveness to the people who need it most—managers working on the ground to protect the things we care about from wildfire.

Innovating Tools to Reduce Wildfire Risk and Increase Firefighter Safety

Current wildfire challenges demand cutting edge approaches to wildfire response. This is why the Wildfire Risk Management Science Team focuses on understanding wildfire risks and providing tools to managers to reduce those risks. Our tools support multiple aspects of the wildland fire management system, from planning and preparing landscapes for wildfire, to decision making during wildfires, to examining workforce needs to ensure personnel are set up for success. Alongside managers, we incorporate new knowledge into a growing suite of tools that support safer decisions on the ground.

Our Tools are Used on All Wildfires

Potential Operational Delineations (PODs):

This framework is used by fire managers and community partners to preplan for wildfire. PODs have already been deployed on every fire-prone forest in the Western U.S.

Quantitative Wildfire Risk Assessments (QWRAs):

Prefire risk assessment provides the basis for planning actions that mitigate wildland fire risks to the public, critical infrastructure, and natural resources. During a fire, these tools help prioritize what is at risk and how to respond.

Suppression Difficulty Index (SDI):

This analytic tool helps incident management teams identify opportunities to engage a fire under a range of conditions, anywhere in the U.S.

National Snag Hazard Map: This map uses machine learning to identify firefighter exposure to hazardous trees, which helps protect firefighters.

Potential Control Location Suitability (PCL):

This strategic tool uses machine learning to predict control opportunities and challenges on the ground before a fire even starts.

FireCon:

The Fire Containment Suitability Dashboard is currently in testing. It complements the PCL tool and uses AI to produce a tactical daily forecast of fire containment suitability anywhere in the Western U.S.

AI Optimized Fuels Management: This set of tools uses remote sensing and machine learning to integrate timber harvest and prescribed burning with local cost and revenue estimates.

The Wildfire Risk Management Science Team has developed, and is constantly improving, a suite of key tools used every day by wildfire managers. Our tools are easily accessed on an **interactive dashboard**. We co-developed the **Incident Strategic Alignment Process** with incident management teams to facilitate using these tools for fire decision support. The process is now used by every complex incident management team nationwide.

Our Tools Are Used on All Wildfires

Our decision support tools form the foundation of every wildfire management strategy in the U.S. The Forest Service and other Federal and State land management agencies have fully incorporated our tools into prefire planning and wildfire incident response. We also dive into workforce issues and the health and well-being of firefighters. Our work continues to expand in scope, with international collaborations with Australian, Spanish, and Canadian fire management agencies and research entities.

“We are partnering with the Wildfire Risk Management Science Team because it’s so beneficial to both of us. Research gets insight into how fire management actually works on the ground and the challenges we face, and we get hands-on instruction with the tools and frameworks they develop for us.”

—Dan Dallas, Incident Commander, Rocky Mountain Complex Incident Management Team 1

We Partner Directly With Wildfire Managers

The Wildfire Risk Management Science Team developed the prefire planning frameworks PODs and QWRA together with Forest Service and interagency partners, facilitating their widespread adoption and use on more than 80 national forests and multiple other State, Federal, and Tribal lands. Recognizing the vital importance of fire experts as critical in the development of viable tools, we are partnering with several of the top incident management teams in the country. These partnerships grew from on-site participation and testing new tools, in which the needs of incident management inform our team’s

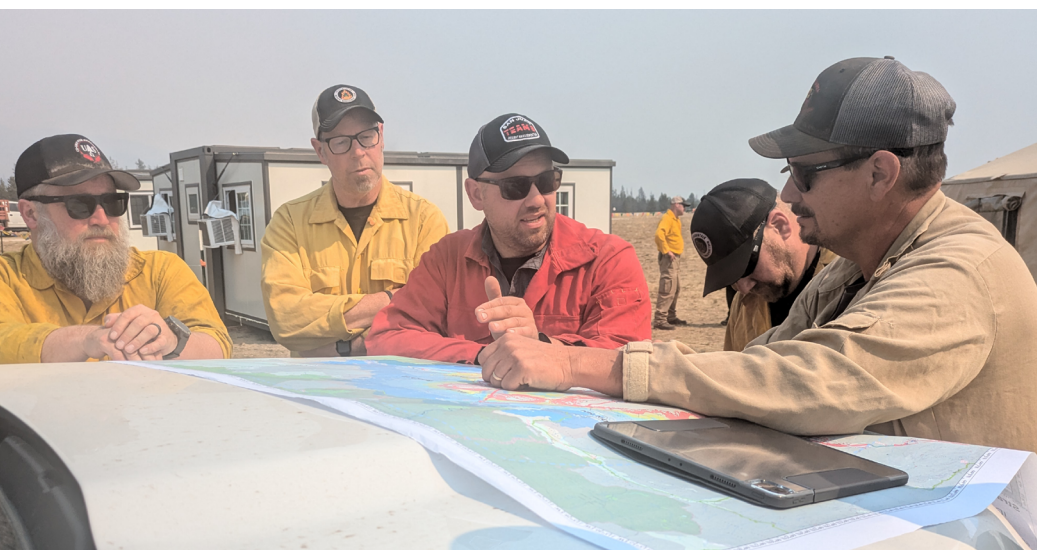


Burnout operations along a POD boundary on the 2017 Pinal Fire near Globe, AZ. USDA Forest Service photo by Mary Lata.

research directions, and new tools are tested and validated by fire managers in the field as soon as they’re developed. This feedback loop has allowed us to become even more relevant to incident response.

More About the Wildfire Risk Management Science Team

Situated in the Human Dimensions Program at the Forest Service’s Rocky Mountain Research Station, the **Wildfire Risk Management Science Team** brings together scientists with a diverse mix of expertise in natural resource management, computer science, ecology, economics, and on-the-ground incident management experience to develop tools that are timely, practical, and useful to managers in the field.



Communicating strategy with WRMS analytics on the 2024 Wapiti Fire, Stanley, ID. USDA Forest Service photo by Brad Pietruszka.