Joint Fire Science Program

PROGRESS REPORT

FISCAL YEARS 2024 AND 2025

JOINT
FIRE SCIENCE
PROGRAM

Photo by Zach Brown

INTRODUCTION

The Joint Fire Science Program (JFSP) was statutorily created by Congress in 1998 as a collaborative wildland fire science research program to support decision making and improve fire management practices. It is a joint partnership between various agencies, including the U.S. Department of Interior (Bureau of Land Management, National Park Service, Fish and Wildlife Service, Bureau of Indian Affairs, U.S. Geological Survey, Office of Wildland Fire) and U.S. Department of Agriculture (USDA) Forest Service.

The program's research priorities are guided by the needs of fire managers, who help shape and frame key research questions (Figure 1). Each year, the JFSP solicits proposals in three categories based on the emerging and long-term needs of fire managers: Primary Research, Graduate Research Innovation, and Regional Exchange. Since its inception, the JFSP has funded over 300 organizations, including federal agencies, state and local governments, tribal entities, non-profit organizations, and academic institutions.

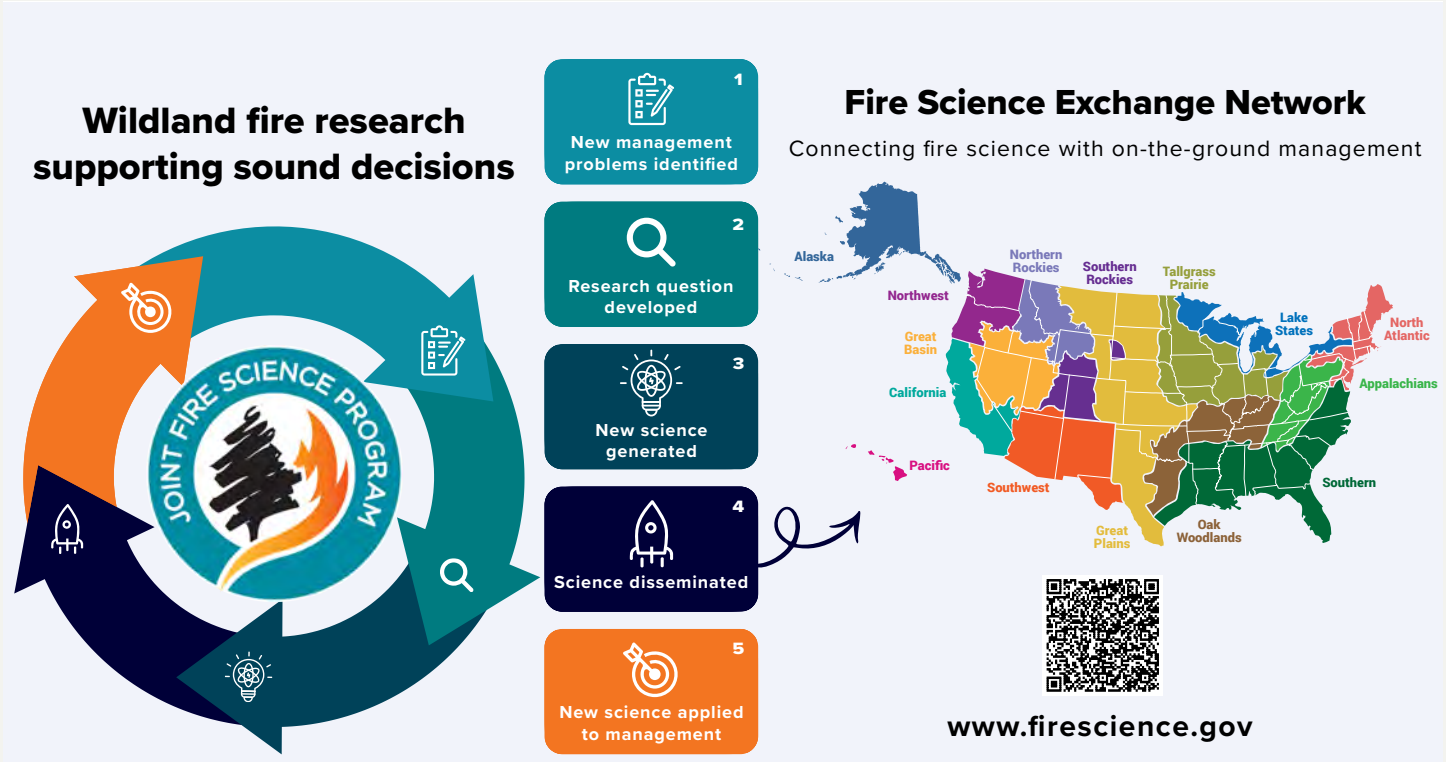


Figure 1. This infographic demonstrates the step-by-step process for supporting sound fire research decisions.

Photo by Brian Pippin, USFWS

BUDGET

The JFSP Governing Board allocates a majority (over 90%) of the program's funds to wildland fire research, and science delivery and knowledge exchange. This approach of disbursing funds allows for thoughtful integration of wildland fire science informing management decisions on the ground. A small portion of funds covers program management. In Fiscal Year (FY) 2024, the JFSP operating budget was $10 million, with funds received from the U.S. Department of Interior and USDA Forest Service, including the Bipartisan Infrastructure Law (BIL) and the Infrastructure Investment and Jobs Act (IIJA). The FY2025 operating budget was approximately $7.5 million, with $3 million from the U.S. Department of the Interior, $3 million from USDA Forest Service and $1.4 million from BIL funds.

Figure 2 below illustrates the dynamic levels of JFSP funding over the last 27 years. Roughly half of the program's funds come from the USDA Forest Service and half from the U.S. Department of the Interior through congressional appropriations. Limited funding was received from the BIL and IIJA in FY2022–FY2024.

JFSP Funding 1998–2025

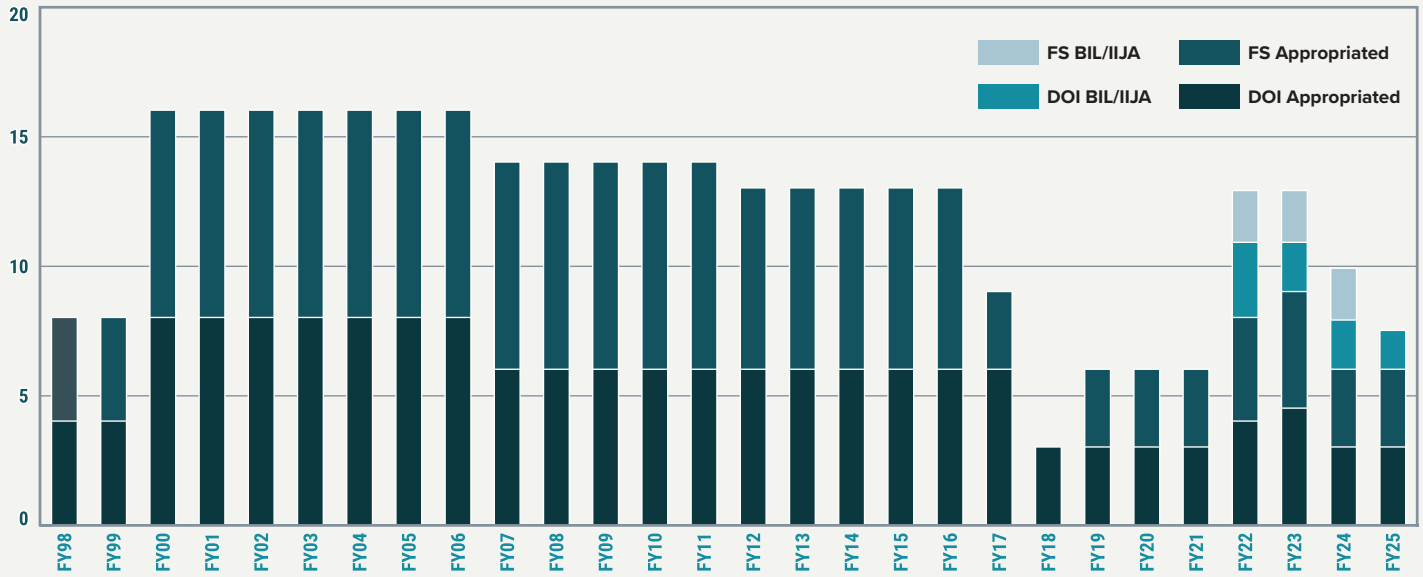


Figure 2. JFSP funding, FY1998–FY2025, in millions.

SUMMARY OF FY2024 AND FY2025 FUNDED RESEARCH

Each year, the JFSP solicits proposals on emerging and long-term needs identified by the science and management communities.

In FY 2024, JFSP awarded funding to 15 projects selected from 38 proposals submitted across 5 research task statements.

Accelerating Science to Action in Fire-Prone Ecosystems: Spurring Innovation in Adaptation Through Knowledge Exchange and Place-Based Partnerships

The objective of this task statement is to strengthen partnerships among scientists, practitioners, managers, and other interested parties to accelerate the identification and adoption of science-based management strategies that facilitate adaptation to changing fire regimes. This task statement was developed and funded jointly with the U.S. Geological Survey Southwest Adaptation Science Center. Of the 4 proposals received, 3 were funded:

- **Accelerating Science to Action Partnerships (ASAP): Implementing science-driven adaptation strategies in the 2-3-2 landscape**
  Alexander Evans, Forest Guild
- **Spurring innovation in adaptation to altered fire regimes in the Sonoran Desert**
  Helen Rowe, Northern Arizona University
- **Translating science to action in Southern California's montane forests**
  Sarah Hennessy, USDA Forest Service

Prescribed Fire Effects on Water Quality and Quantity

The objective of this task statement is to inform the use of fire in highly valued watersheds by evaluating the effects of prescribed fire on water quality and quantity. Of the 10 proposals received, 5 were funded:

- **The reduction of nitrogenous disinfection byproducts in drinking water by prescribed fires in forest**
  Tanju Karanfil, Clemson University
- **Effects of prescribed fire on water quantity and quality in the Cross Timbers Region**
  Chris Zou, Oklahoma State University
- **Effects of repeated prescribed burning on stream water quantity and quality in Piedmont watersheds in North Carolina**
  Joseph Roise, North Carolina State University–Raleigh
- **Integrating burn heterogeneity and precipitation variability into understanding water quality impacts of prescribed fire**
  Alex Webster, University of New Mexico
- **Impacts of prescribed fire on the water supply and water quality in the Indian Creek watershed**
  Taufique Mahmood, University of North Dakota

Managing Carbon Emissions in Ecosystems with Deep Organic Soils

The objective of this task statement is to inform effective strategies for managing carbon stores in deep organic soils that are increasingly impacted by wildfire. Of the 6 proposals received, 1 was funded:

- **Impacts of fire severity, permafrost thaw, and succession on the boreal forest carbon balance**
  Xanthe Walker, Northern Arizona University

Social Equity and Wildland Fire Impacts, Mitigation, Response, and Recovery

The objective of this task statement is to gain better understanding of a broad range of direct and indirect wildfire impacts borne by different sectors of society, the time horizons over which these impacts occur, and factors that influence the ability of individuals and communities to prepare for, respond to, and recover from wildfire. Of the 8 proposals received, 2 were funded:

- **Colorado's Marshall Fire: Impacts and recovery over time through the lens of social equity**
  Katherine Dickinson, University of Colorado–Denver
- **Addressing unequal wildfire risks and impacts in the Southeastern Coastal Plain**
  Jesse Abrams, University of Georgia

Characterizing Wildfire Risk in Wildland-Urban Interface and Urban Settings

The objective of this task statement is to evaluate and improve existing methods to characterize wildfire risk to wildland-urban interface (WUI) and urban settings. Of the 10 proposals received, 3 were funded:

- **Examining and enhancing the factors supporting current WUI risk approaches at multiple scales**
  William Mell, USDA Forest Service
- **Optimizing WUI fire risk assessment: From hazard analysis to damage evaluation**
  Michael Gollner, University of California–Berkeley
- **Advanced spatial data analytics for parcel- and neighborhood-level wildfire damage and risk assessment**
  Alan Murray, University of California–Santa Barbara

Photo by Sean Burke, BLM

In FY2025, JFSP awarded funding to 8 projects selected from 22 proposals submitted across 2 research task statements.

Accelerating Science to Action in Fire-Prone Ecosystems: Spurring Innovation in Adaptation Through Knowledge Exchange and Place-Based Partnerships

The objective of this task statement is to strengthen partnerships among scientists, practitioners, managers, and other interested parties to accelerate the identification and adoption of science-based management strategies that facilitate adaptation to changing fire regimes. Of the 8 proposals received, 4 were funded.

- **From flames to fish: Development of a reproducible model of co-management for wildfire and aquatic species at Zena Creek Ranch, Idaho**
  Jennifer Pierce, Boise State University
- **Accelerating science into action in fire-adapted wilderness ecosystems: Supporting wilderness prescribed fire through knowledge exchange and place-based partnerships**
  Andrew Larson, University of Montana
- **Spurring evidence-based wildfire adaptation through research-practitioner partnerships: What gets measured gets managed**
  Hannah Brenkert-Smith, University of Colorado–Boulder
- **Increasing Oregonians' resilience to wildfires across alternative futures**
  Erica Fleishman, Oregon State University

Interactions Between Invasive Plants and Fire Regimes and Incorporation into Wildland Fire Fuel Models, Risk Assessments, and Other Decision Support Tools

The objective of this task statement is to increase knowledge of the interactions between various invasive plant species and fire regimes and to incorporate new knowledge of invasive species into wildland fire fuel models, risk assessments, and other decision support tools. Of the 14 proposals received, 3 were funded:

- **How do invasive plants affect the spatial and temporal patterns of fuel structure and moisture, and influence fire regimes?**
  Dave Barnard, USDA Agricultural Research Service
- **Assessing the interactive impacts of cogongrass and invasive woody plants on fire regimes of the southeastern USA**
  Carissa Wonkka, University of Florida
- **Can we simultaneously increase resistance to invasion and reduce fire risk in sagebrush ecosystems?**
  Lisa Ellsworth, Oregon State University

JFSP SUSTAINED RESEARCH NEEDS

Sustained research topics address complex management problems and require a coordinated, multi-year approach to develop integrated solutions useful to fire and fuel managers. These are intended to guide JFSP investments over a period of 3–5 years, or longer.

What are the criteria for sustained research topics?

- The topic is of high priority to the fire and fuels management community and is within JFSP's mission.
- The issue is enduring and results obtained over 3–10 years will be relevant.
- Research questions have sufficient complexity that a focused, long-term approach involving a sequence of research is required.
- The topic has the need and potential to build towards a significant deliverable to improve management effectiveness.

Current Sustained Research Topic: Firefighter Health and Wellness

Firefighter health and wellness is a complex issue for all levels of the wildland fire organization. The firefighting environment and tempo include arduous work in remote locations for weeks or even months, leading to issues with fatigue, exposure to hazardous conditions, and potential consequences for long-term physical and mental health. The JFSP is working with numerous organizational partners (e.g., NIFC Medical and Public Health Advisory Team, Colorado State University, USFS Rocky Mountain Research Station) to advance this very important science management need. Potential product outcomes may include a science needs assessment with partners, best practices for fatigue management, and potential future research projects.

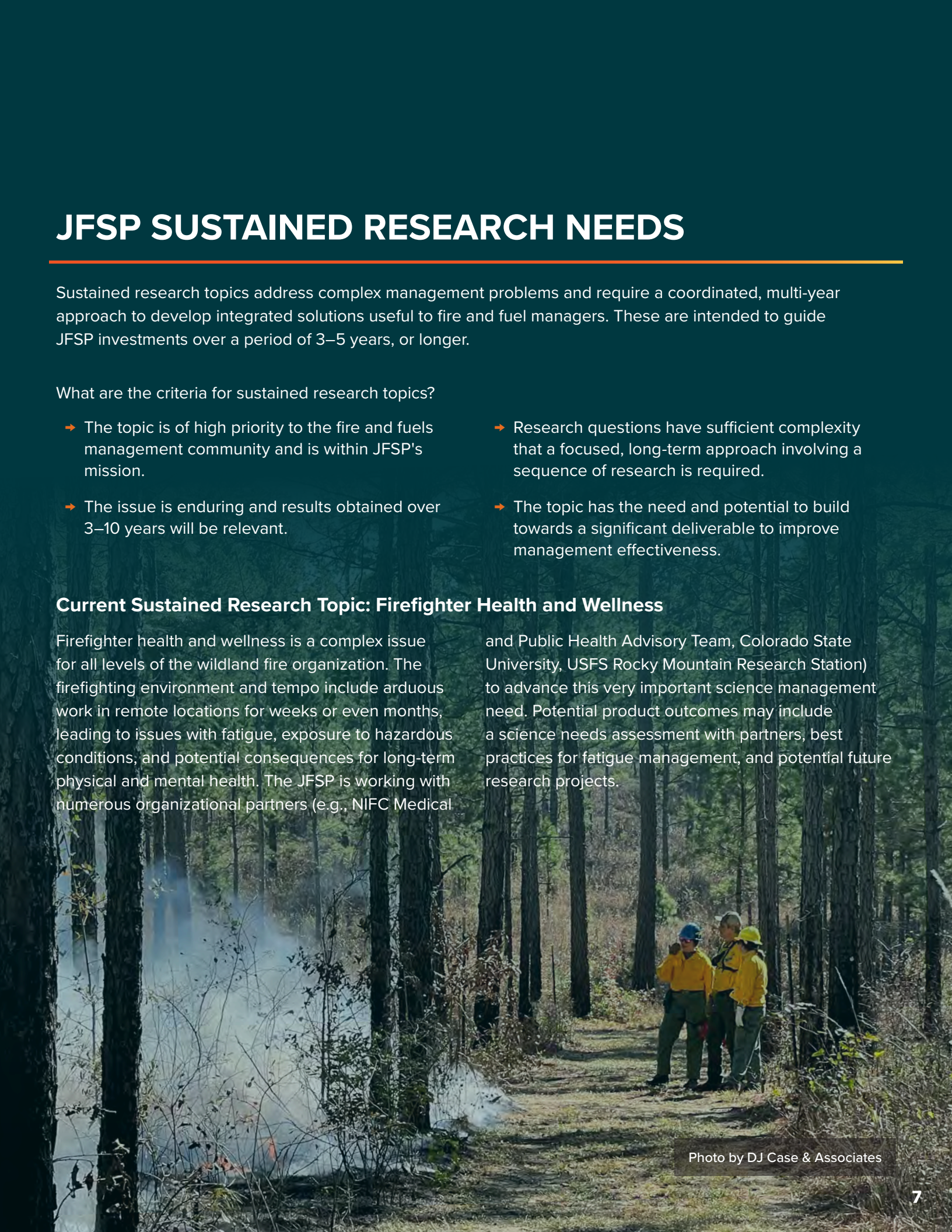


Photo by DJ Case & Associates

IMPORTANT JFSP-FUNDED RESEARCH FINDINGS

In FY2024 and FY2025, several previously funded research studies published notable findings.

CO-MANAGEMENT OF WILDFIRE RISK

In FY2017, the Joint Fire Science Program awarded funding to projects exploring fundamental and applied research on the human dimensions of fire-risk co-management. Because fire is a complex environmental issue, co-management involves many stakeholders—each with different risk perceptions, values, tolerances, and capacities to respond. These differences shape how stakeholders view management options, responsibilities, and accountability. Completed research findings from Emily Jane Davis, Darren J. McAvoy, Heidi R. Huber-Stearns, Tony S. Cheng, Branda Nowell, and Toddi Steelman were synthesized into a 2-page factsheet with applicable findings for managers and practitioners (Figure 3).

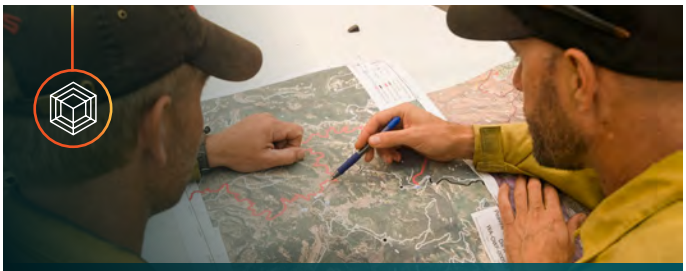
See the full factsheet online at:
www.firescience.gov/ords/prd/jf_jfsp/file/getfile/PUBLICATION/282.

Boundaries

It is important to discuss boundaries between agencies, organizations, and landowners up front. Identifying ways to overcome these boundaries creates opportunities for all responsible parties to understand each other, share resources, and work together.

OVERCOMING BOUNDARIES

Boundary-spanning features (listed below) help people from different sides of a boundary come together and collaborate to solve complex problems.



Boundaries across organizations can be caused by different land ownership, primary functions, culture, and perspectives.
Credit: Kari Greer, Wildland Fire Photographer.

People/Organizations These are the people or organizations that connect different groups or sides of a boundary (cooperative extensions, collaborative groups, land trusts).

Objects These are tools or physical items that help different groups understand each other (maps, models, agreements, charters).

Concepts These are ideas or terms that create a shared understanding across different groups (ecosystem, resilience).

Settings These are the environments or spaces—either physical locations or organizational structures—where collaboration can happen (institutions, funding sources, policies, meeting venues).

Figure 3. Excerpt and key takeaways from the *Co-Management of Wildfire Risk* factsheet.

LANDSCAPE-SCALE FUEL TREATMENTS

Wildland firefighters can use strategically placed fuel treatments across landscapes to reduce wildfire risk and create suppression opportunities because they can decrease fire intensity and rate of spread both inside and outside treatment boundaries. JFSP-funded research resulted in some key strategies for effective fuel treatments, synthesized in an infographic (Figure 4).

View it online at:
www.firescience.gov/ords/prd/jf_jfsp//file/getfile/PUBLICATION/324.

Figure 4. This JFSP-funded infographic illustrates key strategies for effective fuel treatments.

REBUILDING AND RESILIENCE AFTER WILDFIRE

As wildfires become more frequent and destructive, communities face the difficult process of recovery and rebuilding. Recovery is not only about replacing what was lost; it's also an opportunity to design communities that are more resilient to future fire. JFSP-funded research by Mockrin, Schmidt, and Adamczyk yielded various publications including information on considerations for rebuilding after fires, what the data shows with rebuilding, and recommendations for resilience. Their findings were synthesized into a factsheet (Figure 5).

Access the factsheet online at:
www.firescience.gov/ords/prd/jf_jfsp//file/getfile/PUBLICATION/325.

The Rebuild Cycle: What the Data Shows

Although timelines vary, data suggest that most homes are eventually rebuilt. For example, one study found that after 28 major California wildfires (1970–2013), 94% of destroyed homes were rebuilt within 13–25 years. New construction also continues post-fire—in fact, new construction outpaced rebuilding after 75 of 106 fires investigated by Alexandre et al. (2015), from 2000–2010.

Considerations for Rebuilding

For residents who lost their homes in a wildfire, rebuilding and recovery are often likened to a 'second disaster'. At the community or local government level, managing wildfire recovery is challenging, labor-intensive, and requires additional resources.

Other factors influencing recovery speed include:

- Conflicts between stakeholder goals
- Location and extent of losses
- Grant, economic, and regulatory complexity
- Population size, community capacity, and rebuilding resources
- Availability of outside support organizations

Moving Forward: Recommendations for Resilience

Most wildfire losses occur in the WUI. Prioritizing people-centered recovery means prioritizing place-centered recovery, because people live where they live for a reason. Following these recommendations can help improve future outcomes after catastrophic wildfires.

- Invest in community organizations, homeowners, and rental agencies where levels of trust and connection tend to be higher.
- Proactively work to align conflicting goals in state and local policies
- Track and monitor long-term recovery outcomes
- Tailor outreach and resources to the local context
- Consider how wildfire recovery can accommodate other risk reduction and sustainability goals
- Develop a joint local/county resource guide with step-by-step recovery processes
- Build a long-term recovery framework and identify which agency is best positioned to manage recovery funds

Figure 5. Key findings from the JFSP-funded *Rebuilding and Resilience After Wildfire* factsheet.

SUMMARY OF FY2024 AND FY2025 COMPLETED PROJECTS

Researchers complete their JFSP-funded research in a 2–3-year time frame. Upon completion, each research team submits a final report that includes project objectives, main findings, discussion, and next steps. In FY2024 and FY2025, the JFSP received 12 completed research project reports:

- **Wildland fuel characterization for fire science and management: Synthesis of existing knowledge and research needs**
  Susan Prichard, University of Washington
- **Improved modeling of tree mortality from statistical sampling of recent wildfires on the West Coast**
  Andrew Gray, USDA Forest Service
- **Using next generation fuels data and outcome-based metrics in fire risk assessments for high value resources in the sagebrush biome**
  Jeanne Chambers, USDA Forest Service
- **Impacts of restoring fire to coastal pine forests on seed viability of invasive Chinese tallow**
  Heather Alexander, Auburn University
- **Relative importance of weather and socio-cultural factors to fire managers decisions**
  David Weise, USDA Forest Service
- **Quantifying prescribed fire's capacity to mitigate wildfire-induced damage and loss of valued resources**
  Christopher Ross, Tall Timbers Research Station
- **Developing and evaluating fuel break performance metrics across spatiotemporal scales and for multiple risk factors in sagebrush landscapes of the Great Basin**
  Douglas Shinneman, U.S. Geological Survey
- **Integrating post-wildfire debris-flow and flood risk assessments and value change metrics with QRA (Quantitative Risk Analysis)**
  Ann Youberg, University of Arizona
- **Linking understory community functional traits and fire behavior in two fire-dependent forest types**
  Heather Alexander, Auburn University
- **Assessing dependence of wildfire projections on climate model resolution and precipitation physics**
  Chris Forest, Pennsylvania State University
- **Assessing fuel breaks using an empirical spatial fire planning model in the context of suppression**
  Yu Wei, Colorado State University
- **Evaluating fuel treatment efficacy in reducing risk of high-severity fire and downstream impacts**
  Larissa Yocom, Utah State University

GRADUATE RESEARCH INNOVATION AWARDS

Graduate Research Innovation (GRIN) awards are open to master's and doctoral students studying wildland fire and related physical, biological, and social sciences. This competitive award program is designed to support innovative research that contributes to advancing the science and management of wildland fire, and aims to nurture the next generation of researchers and professionals in the field of fire science. The awards provide students with the opportunity to conduct impactful, high-quality research that directly addresses contemporary challenges related to wildland fire, such as fire behavior, ecosystem resilience, community protection, and fire management practices.

In FY 2024, 25 proposals were received, and 11 proposals were selected for funding (Table 1).

Table 1. FY2024 GRIN proposal award recipients.

PROJECT TITLE	STUDENT INVESTIGATOR	AGENCY/ ORGANIZATION
Drivers of conifer regeneration in successively burned areas in the central Sierra Nevada	Saba Saberi	University of California–Davis
Relative effects of mesophication and woody thickening on fuel bed flammability in an oak woodland	Alicia Arrington-Thomas	University of Mississippi
Effect of fire on regeneration in the alpine treeline ecotone and its implications for the threatened whitebark pine (Pinus albicaulis)	Joshua Beisel	University of Montana
What the duff? An examination of long-unburned montane longleaf pine duff layers and their impact on fire behavior and tree mortality	Kathleen Gabler	Auburn University
Remote sensing the effects of wildfire on water quality in mountain lakes	Brooke Bannerman	University of Montana
Perceptions of ignition sources and fire history in Southwestern U.S. communities	William DeGrandpre	Northern Arizona University
Assessing the effects of pile burning-induced soil heating in Alaska's boreal forest	Matt Behrens	Northern Arizona University
Evaluating how wildfire severity shapes genetic diversity for species inhabiting fire refugia	Peter Billman	University of Connecticut
Effects of post-wildfire resprouting on forest structure to inform future fuels management	Dawson Bell	Sonoma State University
Machine learning classification of unknown fire causes in Western U.S.	Yavar Pourmohamad	Boise State University
How do landscape factors modulate extreme fire spread and burn severity in the Southwestern U.S.?	Jessika McFarland	Western State Colorado University

In FY 2025, 22 proposals were received and 7 were funded (Table 2).

Table 2. FY2025 GRIN proposal award recipients.

PROJECT TITLE	STUDENT INVESTIGATOR	AGENCY/ ORGANIZATION
Functions of fire-adapted fungi: A microbially-informed approach to tree regeneration following severe fire	Mira Ranganath	University of Washington
Assessing reburn potential in the Klamath Mountains using field calibrated fuelbed characteristics	Joseph Nicholas	Humboldt State University
Impacts of anomalously short interval wildfires on understory vegetation recovery in Rocky Mountain subalpine forests	Dalton Brantley	University of Montana
Long-term effects of fire on Microstegium vimineum demography and seed bank dynamics in central hardwood forests	Kayla Morrison	University of Illinois–Urbana-Champaign
Evaluating impacts of prescribed burning on the understory layer of mid-latitude Appalachian forests	Sarah Roth	University of Maryland
Understanding and mitigating trade-offs between fuel reduction methods and ecosystem services in grasslands	Advyth Ramachandran	University of Colorado–Boulder
Characterizing fire refugia in a rare serotinous conifer forest	Olivia Moskowitz	Humboldt State University

In FY2024 and FY2025, 37 GRIN projects were completed (Table 3).

Table 3. FY2025 GRIN proposal award recipients.

TITLE	STUDENT INVESTIGATOR
Determinants of flammability in the critically imperiled pine rocklands of Long Pine Key	Owen Schneider
Effects of fuel treatment configuration on avian diversity in western dry forests	Don Radcliffe
Factors contributing to legacy hardwood mortality following prescribed fire	Heather Rickard
Refining post-fire hazard management tools with advanced geomorphic assessment	James Guilinger
Insects and post-fire restoration: Manipulating habitat to encourage beneficial insect communities	Christine Mott
Experimental investigation of slope and precipitation intensity on post-fire mulching effectiveness	Lindsey Hayter
Low-cost UAS* platforms to quantify and predict post-fire recovery in arid shrublands	Andrii Zaiats
Measuring post-fire resilience of microbial richness, composition, and functions in chaparral	Fabiola Pulido-Chavez

*Unmanned aircraft system

Table 3. Continued.

TITLE	STUDENT INVESTIGATOR
Impacts of wildfires and climate change on western larch regeneration	Spencer Vieira
Planning for uncertain fire futures: A model of microclimate and fuel moisture in mesic forests of the Northeastern U.S.	Peter Breigenzer
Impact of fire on climate change vulnerability of tailed frogs (Ascaphidae) in Oregon	Amanda Cicchino
Stand-level drivers and management impacts on trajectories of reburn potential in Western Cascadia	Jenna Morris
The effects of re-introducing fire in a long-unburned mixedwood forest	Jonathan Goode
Navigating collaborative wildfire risk reduction across boundaries: The influence of policy and science translation	Noah Haarmann
Characterizing a decision-making process to shift fire management paradigms around natural ignition	Scott Franz
To burn or not to burn: UAS* mapping of tree-level foliar moisture content	Lauren Lad
Determining social wasp community and population responses to wildfire in mixed-conifer forests of the Central Californian Sierra Nevada	Gabriel Foote
Modeling the impacts of urban fire and vegetation management on flooding and sedimentation	Danielle Hunt
Understanding the foraging ecology of red bats (Lasiurus borealis) and seminole bats (Lasiurus seminolus) to inform prescribed fire management	Ashley Epstein
Post-wildfire hydrogeomorphic risk management assessment	Haley Canham
Evaluating bark beetle use of fuel treatments for better fuel treatment design	Jonas Noomah
A comparison and development of methods for estimating sagebrush shrub biomass and fuels	Georgia Harrison
Barriers to prescribed fire use by the Department of Defense	Emily Rabung
Above and below ground communities: An investigation of post-fire regeneration across scales of a watershed	Michael McNorvell
Southeastern populations impacted by smoke: Recent patterns and possible shifts under climate change	Megan Johnson
Linking seasonal timing of fire, soil disturbance, and seed arrival to post-fire recovery and restoration	Gage LaPierre
Characterizing rainstorm intensity, duration, and size across an elevation gradient for assessment of post-fire hazards	Phoebe White
Projecting long-term impacts of management actions and climate on boreal forest fuel characteristics	Nicholas Link

*Unmanned aircraft system

Table 3. Continued.

TITLE	STUDENT INVESTIGATOR
Augmenting pre-fire debris-flow hazard assessments with runout modeling to inform pre-fire management decisions	Alexander Gorr
Forecasting prescribed fire smoke within vulnerable communities in Southern Appalachia	Katherine Jones
Effects of wildfire burn severity on pollinator habitat and community composition two decades post-fire	Alaina Smith
Classification and high-resolution delineation of the fire-prone wildland-urban interface	Megan Dolman
Impacts of prescribed fire on drought resilience of ponderosa pine and Douglas-fir	Charlotte Reed
Using NAIP DAP** and Landsat*** time series data to quantify post-fire vegetation recovery	Madeline Franz
Making it out alive: The story of wildland fire microbial emission factors	Phinehas Lampman
Perceptions of ignition sources and fire history in Southwestern U.S. communities	William DeGrandpre
How do landscape factors modulate extreme fire spread and burn severity in the Southwestern U.S.?	Jessika McFarland

**National Agriculture Imagery Program Digital Aerial Photogrammetry

***NASA and U.S. Geological Survey Earth-observing satellite imagery

FIRE SCIENCE EXCHANGE NETWORK

The Fire Science Exchange Network (FSEN) is made up of 15 regional exchanges (Figure 6) that focus on delivering wildland fire science information to the science and management community. Proposals are awarded annually to the exchanges that translate wildland fire science research for use by fire managers and practitioners in their management and decision-making processes.

Exchanges collaborate with one another as well as other technology transfer organizations in their respective regions to share fire science information and build relationships with partners in the wildland fire management community. The goals of the exchange network include getting science into the hands of managers and practitioners in various easy-to-digest formats, as well as incorporating science findings into on-the-ground decisions.

Highlights from FY2024 and FY2025 exchange annual reports included but were not limited to the following outputs and outcomes:

- Produced 520 newsletters
- Developed 63 syntheses
- Hosted 202 webinars
- Produced 233 factsheets and handouts
- Hosted 434 conferences and workshops
- Developed 70 short courses and continuing education units
- Created 433 video products

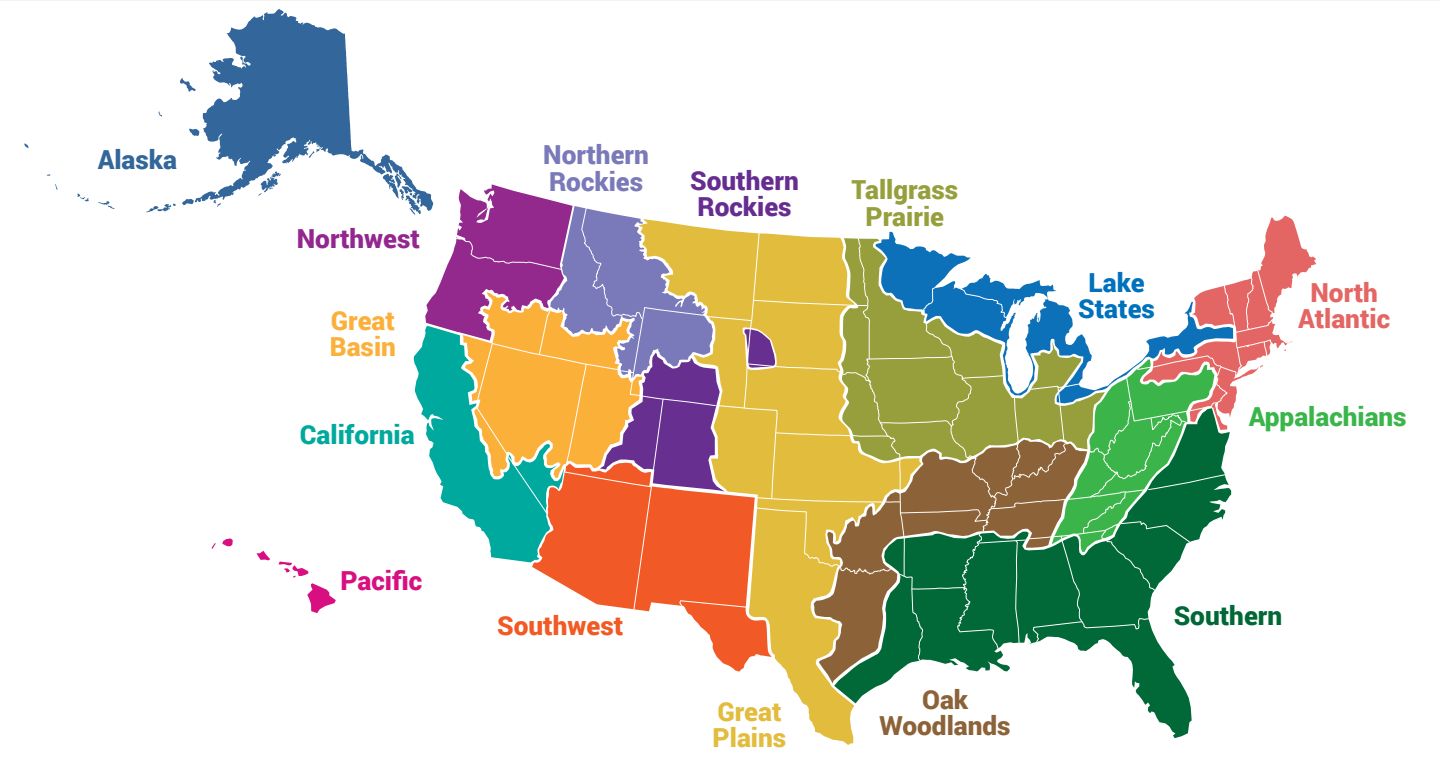


Figure 6. Regional boundaries of the 15 FSEN networks.

FSEN 2024 SUCCESSES

Collaboration Creates Story Map, Outreach Materials

Wildfires in rangeland ecosystems have often been overlooked, a challenge not unique to the Great Basin. After the 2021 Marshall Fire in Colorado, the Southern Rockies Fire Science Network convened several western fire science exchanges, including the Great Basin, Great Plains, Southern Rockies, Southwest, California, Northwest, Northern Rockies, and Tallgrass Prairie and Oak Savanna, to address this issue. Recognizing the complexity of rangeland fires, the Great Basin and Southern Rockies exchanges hired a professional illustrator and designer, sharing costs to create a Rangeland Wildfires postcard (Figure 7) and story map. These materials, developed through collaboration, were successfully distributed in fall 2025 to raise awareness and promote a unified message on the importance of addressing rangeland wildfires.

View the story map online at:
https://storymaps.arcgis.com/stories/554774f928fa4f2590b7eb028f2b4d23

Video – What is the Fire Science Exchange Network?

In 2025, the JFSP Program Office partnered with DJ Case & Associates to produce a short video showcasing the Fire Science Exchange Network. The piece features interviews with former program managers, exchange coordinators, principal investigators, and local partners. It highlights how the 15 exchanges help deliver fire science to managers in accessible, practical ways across multiple platforms.

Watch the video here:
www.youtube.com/watch?v=yfGVmNP2oz0

Figure 7. Rangeland wildfire educational postcard.

FSEN 2025 SUCCESSES

Development of Hurricane Helene Resources

In the aftermath of Hurricane Helene, land managers, practitioners, natural resource managers, and researchers have faced complex challenges in understanding how post-disturbance conditions may shape future fire regimes across the Appalachian region. The urgent need for applied fire science in heavily impacted landscapes (Figure 8) is driven by altered fuel structures and significant debris accumulation, which require strategic, adaptive management approaches to safely and effectively implement prescribed fire. The Consortium for Appalachian Fire Managers and Scientists (CAFMS) has been at the forefront of convening federal and state partners, sharing on-the-ground perspectives and building collective understanding of the research tools available to assess fuels and guide post-disturbance, fire management decisions. Through a co-production process with scientists and managers, CAFMS developed an online resource to host and disseminate relevant fire science and management strategies following Helene, a repository that—along with continued on-the-ground support for adaptive management—will continue to evolve.

More information can be found at:
www.appalachianfire.org/hurricaneheleneresources

Figure 8. Hurricane Helene damage at a burn unit in North Carolina. Photo by Brian Rogers, North Carolina Forest Service

CONVERSATION WITH CAFMS LEADERSHIP TEAM

Each year, the FSEN networks are asked to respond to questions about connecting the short-term and long-term objectives of their knowledge exchange efforts. Here, we highlight responses from the leadership of the Consortium for Appalachian Fire Managers and Scientists; their answers stood out as they navigated the challenge of Hurricane Helene-related effects on fire management.

Adam Coates, CAFMS
Principal Investigator

Lindsey Hosier, CAFMS
Public Information Coordinator

Q: How do the impacts that you outline in your annual report contribute to longer-term objectives?

A: Our collaborative efforts in disseminating emerging research need[s] in the wake of Helene contribute to several short-, medium-, and long-term outcomes as outlined in our annual report logic model. Our primary goal is to disseminate products and host activities that will increase and accelerate the flow of fire science and management information between scientists and managers in the Appalachian region.

By fostering dialogue and discussion amongst managers and scientists, CAFMS is increasing manager's regional knowledge as well as increasing collaboration with the goal to improve the implementation of prescribed fire.

Q: Do you need to adjust any of your longer-term objectives based on new regional needs or feedback from regional partners? If so, how?

A: CAFMS continues to work on new and emerging regional needs. One emerging need that has been discussed previously is the continued impact of alterations in long-term weather patterns and prescribed fire operations. Hurricane Helene has now greatly impacted fuel loading and structure throughout the region, thus expanding our need to address manager concerns regarding these issues. Opportunities to work with other FSENs, such as SFE [Southern Fire Exchange], to increase our awareness of the impacts of hurricanes on fire management, will be warranted in the coming year.

Photo by Kyle Miller, USFS

CALIFORNIA FIRE SCIENCE CONSORTIUM KEY TOPICS

This year, the California Fire Science Consortium (CFSC) worked on 16 fire science topics identified by the JFSP. Each subregion focused on different and overlapping topics based on their subregional needs, allowing the CFSC to contribute to a variety of topics while remaining relevant to the communities where they work. Examples of the ways the CFSC contributed to the key fire science topics are:

- **Wildlife:** Hosted Fish and Fire 2025 workshop at the Salmonid Restoration Conference, highlighting links between fire, water, and fish.
- **Invasive plants:** Produced brief on fuel management strategies for *Phragmites* species in desert wetlands.
- **Vegetation:** Co-hosted the Mojave Desert Native Plant Materials Development and Restoration Workshop.
- **Soils:** Addressed post-fire sedimentation and restoration strategies through the Fish and Fire 2025 workshop.
- **Watersheds:** Hosted a webinar on the impacts of beaver dams and their analogs on fire behavior and management.
- **Post-fire recovery:** Hosted the "Reforestation Opportunity" webinar, exploring a new planning tool for California private forestlands.
- **Fire behavior:** Led the "Behave7 Fire Modeling" webinar series for fire analysts and prescribed fire planners.
- **Fire regimes:** Hosted a webinar contextualizing contemporary, historical, and projected fire regimes.
- **Fuels management:** Gave presentations on fuel treatment effectiveness at the USFS Region 5 Burn Boss training, and to the Tahoe Fire and Fuels Team.
- **Prescribed fire:** Hosted public "firelighter" trainings, which focused on safe burn crew skills.
- **Smoke and health:** Hosted a symposium presentation analyzing greenhouse gas emissions from the Mosquito Fire.
- **WUI and infrastructure:** Hosted the "Lessons Learned from Los Angeles" webinar on home hardening and defensible space.
- **Firefighter safety:** Convened a CAL FIRE workshop on operationalizing large-scale prescribed fire.
- **Social science:** Met with Paradise, California city leaders during a fire science retreat to discuss recovery lessons.
- **Indigenous knowledge:** Hosted a webinar on ecocultural stewardship and applied fire.
- **Economic impacts:** Contributed a lead-authored section on socioeconomic and public health impacts to the science synthesis informing California's *2026 Action Plan*.

Photo by Hugh Safford

THE FUTURE

The Joint Fire Science Program's future is bright, with exciting opportunities ahead under the new U.S. Wildland Fire Service. The program remains committed to investing in the next generation of fire scientists and managers through the updated Graduated Research Innovation Program, soon to be renamed "Fire Leaders and Managers, Emerging Scientists." The program will continue to cultivate innovation, leadership, and applied research capacity for the next generation of wildland fire researchers. Sustained support for the Fire Science Exchange Network will remain a cornerstone of JFSP work, particularly its essential role in science delivery and technology transfer, ensuring that research findings are translated into understandable information that reaches practitioners when and where they need it most.

Equally important, the program will continue to support fire managers as they address both emerging challenges and long-term fire science needs. Specifically, the JFSP will foster strong partnerships between researchers and practitioners to inform adaptive management and evidence-based decision making. By strengthening these connections and maintaining a focus on practical applications, the JFSP is well positioned to advance the integration of science into management, enhance resiliency across landscapes and communities, and support a more informed, prepared, and collaborative fire workforce for the future.

Photo by Corey Gucker

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