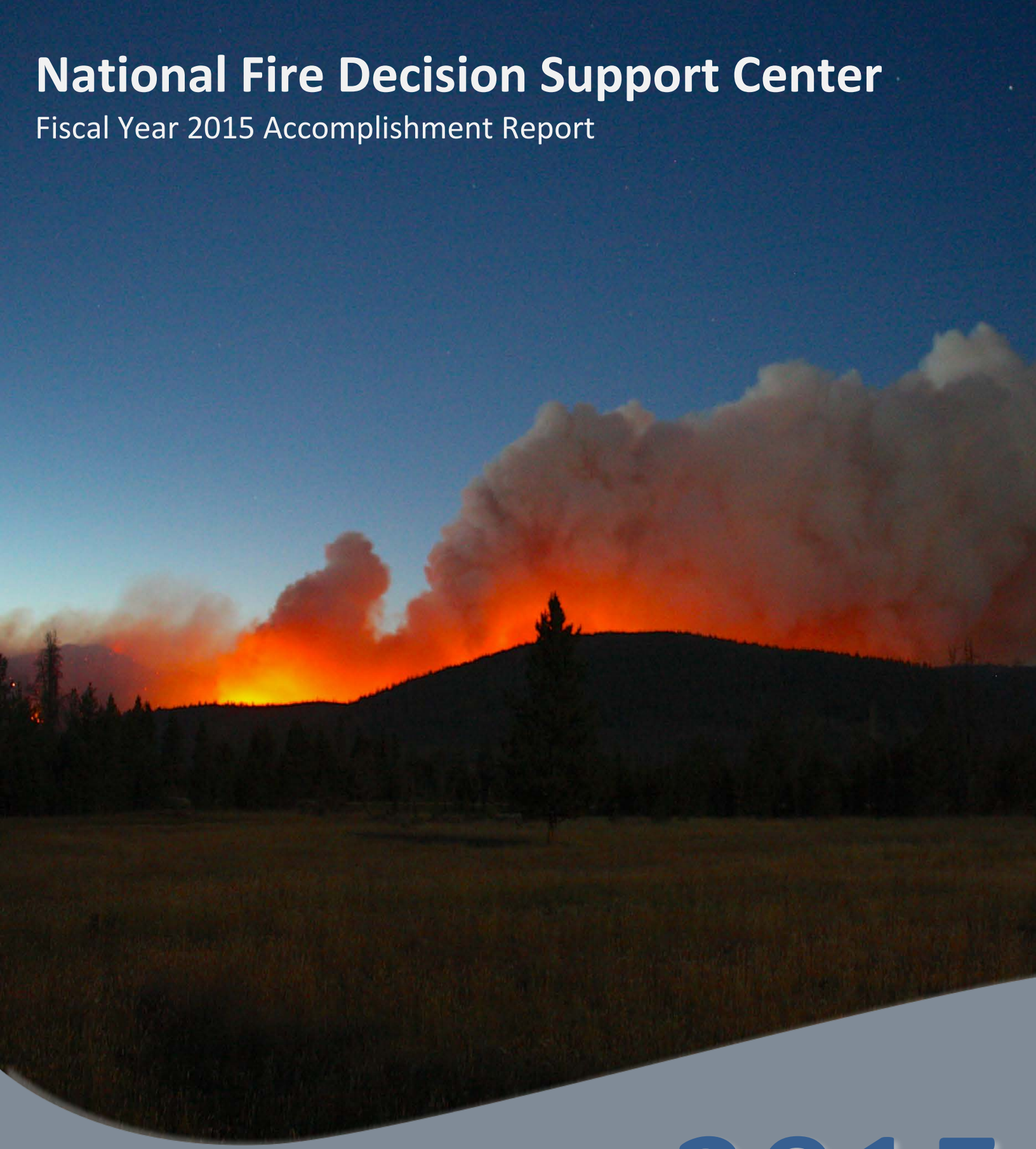
National Fire Decision Support Center

Fiscal Year 2015 Accomplishment Report



Rocky Mountain Research Station, Fire and Aviation Management

2015

Contents

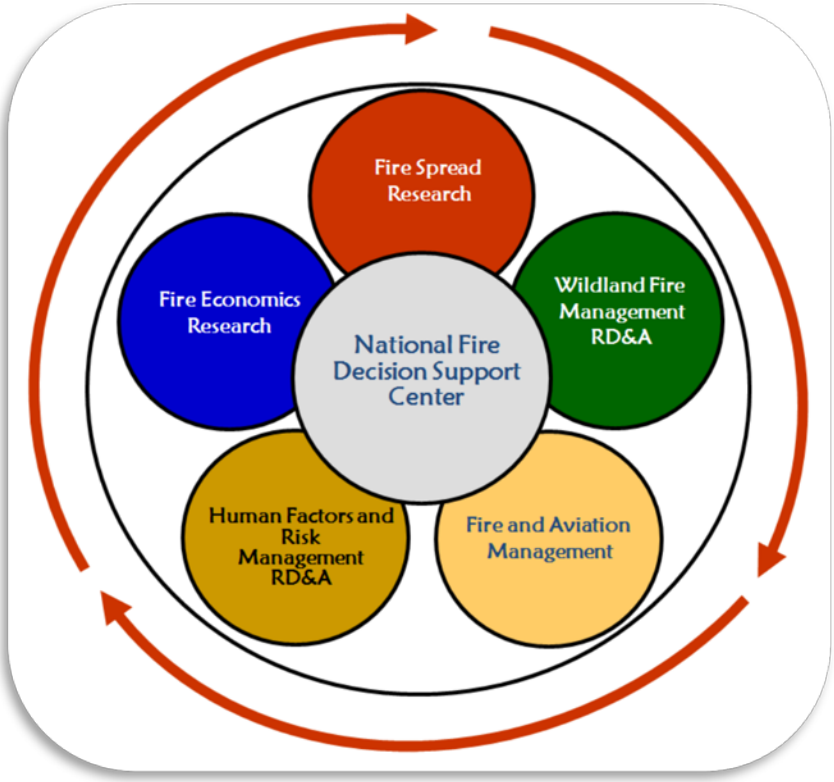
National Fire Decision Support Center

Introduction

The National Fire Decision Support Center (NFDSC) is a collaborative effort between Fire and Aviation Management and Research and Development. It was created to support wildland fire decision making by directly linking fire and economic sciences to operational applications and has been operational since 2009. The NFDSC provides a key link between wildland fire science and the application of that science to benefit field practitioners, decision-makers, and agency stakeholders.

The purpose of the NFDSC is to:

- Improve the science to support large fire decision-making
- Improve fire management decision support tools and processes
- Improve agency capability to make and implement wildland fire decisions
- Improve agency capability to manage fire expenditures
- Maintain centralized decision support capabilities for fires
- Continue development of a safety culture that systematically approaches management of risk.



NFDSC Organizational Components

The NFDSC is a virtual organization comprised of team members from multiple USFS research and management programs, Department of Interior (DOI), and other cooperators. Existing units that provided staff for integration in this effort include the Wildland Fire Management Research Development and Application (WFM RD&A) Program which has Rocky Mountain Research Station (RMRS), WO Fire & Aviation Management (WO-FAM), and Department of Interior (DOI) involvement; Fire Spread Research Fire, Fuels & Smoke Program (RMRS); Fire Economics Research (RMRS); and Human Dimensions Program (RMRS). This figure indicates the Human Factors and Risk Management RD&A is within the NFDSC but their charter was revised in 2015 therefore they are no longer within the NFDSC. In FY2016 the Service Level Agreement for the remaining NFDSC members will be revised.

Fire and Aviation Management

The US Forest Service (USFS) provides exemplary natural resource research at stations and labs across the US and leads research in the many facets of wildland fire management. The NFDSC works to leverage this science for improved risk assessment and decision making for the all levels of the fire organization.

The FS Fire and Aviation Management program provides funding and oversight as needed to the units within the NFDSC. This oversight, funding, and integration allow the NFDSC to work collaboratively and produce meaningful and useful research and applications for a wide variety of internal and external audiences.

Fire and Aviation Management Focus Areas

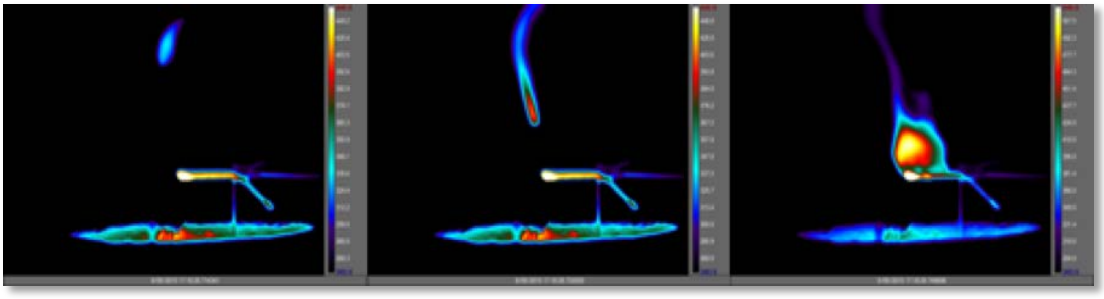
Fire Spread Research Summary

The goal of the fire behavior science program is to understand how wildfires spread so that practical improvements in modeling, training, and mitigation can be developed based on the actual physics of fire phenomena. For decades, models of wildfire spread have been developed and used, but they lack a common approach to representing and organizing the fundamental physical processes. The physical processes that produce fire spread can be easily listed (heat transfer, combustion, and ignition, entrainment etc.) but the organization, order, and required amounts are subjectively and speculatively applied in models because the experimental basis has never determined. This deficit in basic knowledge cripples our ability to make advancements in prediction, train and educate fire fighters in understanding their field observations, and mitigate fire losses and behaviors. Without knowing how fire spread depends on fuels, topography, and weather, management decisions are dependent upon empirical and often incorrect formulations.

FY 2015 Accomplishments

By the end of FY2015, our research program published new and previously undescribed mechanisms of wildfire spread. Specifically, we obtained experimental evidence from the field and laboratory that fire spread depends upon buoyant dynamics of the flame zone rather than the steady-state combustion and heat transfer or energy balance concepts that dominated approaches up to this point. Such a simple explanation implies that simple but physically-based modeling advances are within reach that can describe many of today's un-modeled fire behaviors.

Buoyant Dynamics of Wildland Fires

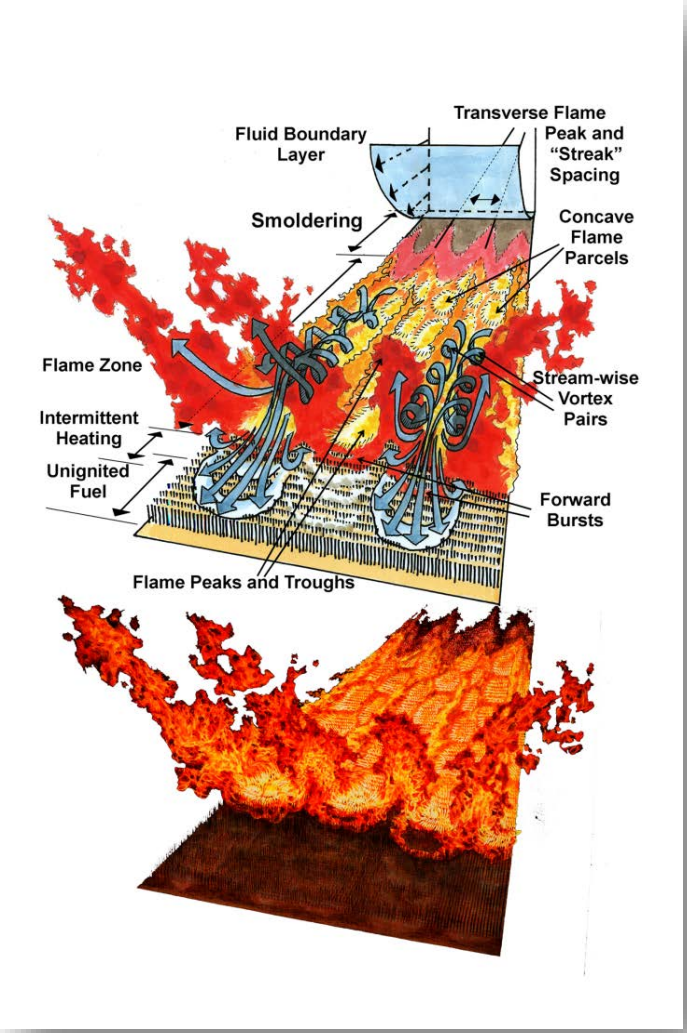


Study of Conductive Heating and Ignition Using AirTorch

Fire spread experiments conducted in Missoula by the NFDSC, and cooperators at the University of Kentucky and the University of Maryland have found that flame structure and heat transfer is dependent upon buoyant instabilities. Instabilities represent the interplay between the hot gasses of the flame zone and the in-drafts to the fire front. They produce very clear patterns that are recognizable from well-known features of fluid flow in boundary layers. Thus, the surprising conclusion is that fire behavior is little different from other well-known fluid problems and not unique as a natural phenomenon. Flame fluctuations produced by buoyant instabilities result in non-steady heating by the flame (pulsation) that ignites fuels by intermittent convection. The first refereed publication of these results was made this year (Finney et al. 2015). The exciting implication of this work is that scale modeling based on other buoyant phenomena could rapidly lead to the ability to develop practical tools that apply equally well to small surface fires and to large-scale crown fires.

Particle Heating and Ignition

For several years, we have been working to substantiate the details of fuel particle heating and ignition because work by the NFDSC has shown unequivocally that particle heating requires flame contact. This finding directly contradicts the assumptions used in almost all fire modeling for the past half-century. Previously, radiation has been assumed to be sufficient and necessary for heating and ignition of wildland fuel particles (grasses, leaves, needles, small branches) – but that is now known to be false. These fine particles that dominate wildland fuel complexes are able to cool so efficiently from ambient air flow that they will not ignite from radiation. Thus, the remarkable conclusion is that flame contact (convective heating) is required for particle ignition and spread – and is only occurring in very close proximity to the active flame edge.



Flame Dynamics Responsible for Conductive Heating of Fine Fuels

Burning Rates of Fuel Complexes

The flame residence time is critical to the spread of wildland fires because if it is less than the ignition time, the fire won't spread. This is of particular concern when discussing the thresholds for crown fire spread (but even surface fires demonstrate spread thresholds), a currently poorly understood aspect of wildland fire.

Curiously, no one theory exists for the prediction of residence time. The burning rate of wood cribs is pursued as an avenue toward a better understanding of the residence time because the two quantities are inversely related and the burning rate of cribs is highly repeatable. To vary the burning rate, cribs are built with different stick thicknesses and densities. Even though wildland fuels do not have the same predictable arrangement as wood cribs, we are interested in whether a fundamental understanding of what governs the burning rate of a crib will apply to the wildland fire context.

Convective heating and heating chemistry of live fuels

Recent evidence demonstrates that fine fuels require flame contact (very rapid convective heating) before ignition because convective cooling offsets radiative heating sufficiently to prevent ignition. Unlike dead fuels, live foliage can be up to half non-structural carbohydrates like sugars and starches which vary from physiological changes throughout the growing season. There is a complicated and unknown relation between the chemical composition and moisture content that has a significant effect on the ignition of live fuels. In the first set of experiments, a wide range of both live and dead forest fuels were convectively heated with air temperatures ranging from 100°C to 600°C. In collaboration with the University of Montana, a high accuracy, fast response mass spectrometer was used to sample and analyze the pyrolysis products. The evolution of both water and carbon dioxide was measured along with the ignition time.

FY 2016 Planned Activities

- Buoyancy Scaling: Test existing buoyant instability scaling relationships outside of the range of laboratory experiments with data collected from field burns and large-scale artificial fuel beds.
- Burning Rates: Extend crib scaling to test applicability to spreading fires and to large scale artificial fuel beds.
- Ignition Experiments and Modeling: Use of thermal camera to examine heating dynamics in spreading laboratory fires, continue experiments on individual particles in the laboratory with forced and natural convective cooling, continue numerical modeling of particle response to radiant heating, convective heating, and convective cooling.
- Flame fluid dynamics: Continue work with experiments and modeling of fluid flow in flame zone.
- Thermophysical properties of wildland fuels: Now that the roles of radiation and convection in spread and ignition are becoming clearer, we must know the thermophysical properties of common fuel components. We will be using non-destructive techniques to measure thermal diffusivity, heat capacity, and conductivity of live and dead fuel particles.
- Fire Spread Modeling: With the organization of the fire spread system determined in some detail, implementation as a model of fire spread and behavior will be conducted for research (and later application).

Burn experiments conducted on a tilting platform to examine slope effects on fire spread and transfer.

Fire Economics Research Summary

The wildfire economics team is a leader in the development and application of knowledge and tools designed to understand the social, ecological, and economic impacts of wildfire management. This interdisciplinary team explores wildfire management through the lenses of risk analysis, economics, decision science, and landscape ecology to improve the scientific basis for the full range of wildfire management decisions. Primary research topics include integrated spatial risk assessment modeling and planning, econometric modeling of fire management expenditures, effectiveness of suppression resource utilization, organizational structure and managerial incentive systems, and performance measurement.

FY 2015 Accomplishments

Wildfire Risk, Decision Analysis, and Planning

In FY 2015, the team enhanced its capacity to expand the role of risk assessment in wildfire and land management planning through its networks of land and fire management partners and academic collaborators. The spatial quantitative wildfire risk framework developed by team members has been modified and expanded to address the following areas: multiple hazard assessments, forest land management planning, local level integration of risk analysis with WFDSS, and wildlife habitat risk assessments.

The team worked with the Region 5 fire planning staff and the Southern Sierra National Forests to integrate innovative risk assessments into a the land management plan revision process. This analytical framework provides critical linkages between potential fire likelihood and intensity and highly valued resources, which then informs land management and resource management planning objectives and directs application to strategic spatial fire planning maps. USFS Region 5 has recently adopted this approach as a necessary and required analysis in all future land management plan revisions.

During FY 2015, the team worked with USGS scientists to advance research on multiple hazards within a landscape, namely wildland fires and post-wildfire debris flows. Results from this line of research have been applied to three fire and debris flow prone landscapes in New Mexico, in order to identify areas of high post-wildfire debris flow hazard, in a pre-fire context. The Nature Conservancy, with support from the Rio Grande Water Fund, is currently expanding upon this work by broadening the spatial extent of the landscape intended for restoration and fuel treatment focused on reducing the hazard of wildfire and post-fire debris flows.

The team continues to assist the field in the development and application of wildfire risk assessments at multiple levels. This information is informing strategic investments in hazardous fuels activities to reduce negative wildfire risks and highlighting opportunities for beneficial wildfire on the landscape. On the San Juan and Rio Grande National Forests in Colorado, the team spurred a new research project that focuses on integrating the spatial risk assessment into WFDSS to drive management decision support before and during a wildfire event. This framework will be shared with the multiple stakeholders of the area in order to attempt an “all hands, all lands” approach to wildfire management, from the ground up. Additionally, this work will include the first pilot study of changes in wildfire risk across time, using the prototype LANDFIRE time series dataset, created specifically for the study landscape.

The team developed two new GIS tools that are currently in use by the field in regional and forest level wildfire risk assessment. The Fire NVC tool (Thompson et al. 2015) allows GIS specialists to apply the standard risk calculations to a landscape of interest. The HSI-fire tool enables wildlife biologists to conduct post-fire assessments of habitat suitability for a number of fire-adapted species to inform post-fire rehabilitation projects.

The team now hosts the personnel (Dr. Karin Short) and responsibility for updating and producing the national Fire Program Analysis fire-occurrence database (FPA FOD) and national grids of wildfire likelihood and intensity generated from the Large Fire Simulation system (FSim).

Team members facilitated and presented at a range of important workshops promoting the application of risk management concepts and tools, including the Wildfire Risk Summit in Tucson, AZ and the Wildfire Risk and Fuel Treatment Workshop in Missoula, MT.

Team members engaged in several large fire assignments, large fire reviews, and special decision support assignments at various Multi-Agency Coordination Centers. These efforts are important to both improving the group's collective understanding of the current management environment and providing expertise on modeling and fire planning to field units.

Suppression Resource Use, Cost, and Effectiveness

The cost of large fire management continues to rise with large fire management expenditures exceeding the allocated budget by over $700 million in 2015. Despite the scale of investment, little is known about how suppression resources affect large fire containment, and there remains considerable variation among the relative fires in their relative costs. The fire economics team continues to lead the research community in understanding the factors that affect fire management expenditures and the effectiveness of suppression resources in achieving stated objectives.

Studying Suppression Resource Use, Cost and Effectiveness

The team continues to explore economic issues related to cost and effectiveness of using suppression resources to manage wildland fires. FY 2015 activities included the development of innovative research to examine the relative contribution of suppression resources along with landscape and fire weather conditions in controlling the perimeters of large wildfires. The team conducted research on the determinants of the level of suppression resource use across incidents and incident management teams, and the use of suppression resources to effectively contain fire growth. Ongoing research efforts include analyses of initial attack success rates to better predict conditions under which potentially large and costly fires can (and cannot) be contained in initial attack efforts, and the tradeoffs associated with using different types of suppression resources to contain fires during initial attack.

The team was a leader in researching the effectiveness and safety implications of aerial firefighting resources. Team members serve on the oversight board for the Aerial Firefighting Use and Effectiveness (AFUE) Study. The AFUE study is a 5-year investment in field-based data collection and research analyses that aims to improve the Agency's understanding of the conditions that lead to effective and efficient use of aerial resources.

The team continues to support the Incident Risk Console (RisC) that is housed within the Enterprise Geospatial Portal (EGP) to provide F&AM leadership with real-time risk-based performance measures on individual fires throughout the fire season.

FY 2016 Planned Activities

- Through the lens of systems analysis, examine the wildfire management organizational structure and its relationship to both Federal and non-Federal Agencies with wildfire management responsibility.
- Work with WO F&AM staff and western regions to expand the application of spatial landscape risk assessment to the Land and Resource Management Planning process.
- Continue collaboration with western regions and other partners on application of wildfire risk assessment at various scales.
- Research new approaches to characterize ecologically beneficial fire and multi-hazard interactions within wildfire risk assessments.
- Continue collaboration with The Nature Conservancy on landscape restoration projects to reduce negative post-wildfire effects and debris flows.
- Continue the pilot study of temporal changes in wildfire risk in the San Juan/Rio Grande National Forests.
- Provide advising and computational expertise to conduct post-wildfire risk assessments for wildlife species and critical habitat in order to assess tradeoffs of various post-fire rehabilitation and salvage logging projects on the Malheur National Forest.
- Update the national fire likelihood grid (FSIM) using improved model components and updated fuel models.
- Examine initial attack success rates and the factors associated with fire escape by examining both historical records and recent wildfire simulation efforts.
- Explore trends and factors that influence suppression resource demand and movement using operational research concepts.
- Examine how Predictive Service products and daily fire potential updates, including the 7-day Significant Fire Activity Forecast, can predict escaped fire potential, suppression resource demand, and improved pre-positioning models.
- Continue research on the factors that determine suppression resource use and effectiveness across incidents, including analysis of the determinants of resource demand.
- Continue development of expenditure models using spatially and temporally explicit data for use in research, decision support tools, and cost benchmarking.
- Continue development and testing of wildfire simulation studies to examine risk-risk tradeoff decisions by Incident Management Teams provide research leadership to enhance and expand the Agency's risk-based training curricula through participation in the Wildfire Risk Summit and other training activities.
- NFDSC scientist, Michael Hand, is currently serving as a Forest Service-sponsored fellow with the White House Social and Behavioral Sciences Team. Projects may examine behavioral components of the use of decision support tools, decisions to deploy suppression resources, and how wildfire managers perceive and respond to risk.
- Engage with WFM RD&A staff to examine the structure of WFDSS to improve information flow and support new spatial fire plan products.
- Provide guidance and economic datasets for the WFIPS program development.

Wildland Fire Management RD&A Summary

The Wildland Fire Management Research, Development, and Application (WFM RD&A) program was created to promote application of the wildland fire scientific knowledge; develop decision support tools; and provide science application services to the interagency wildland fire community.

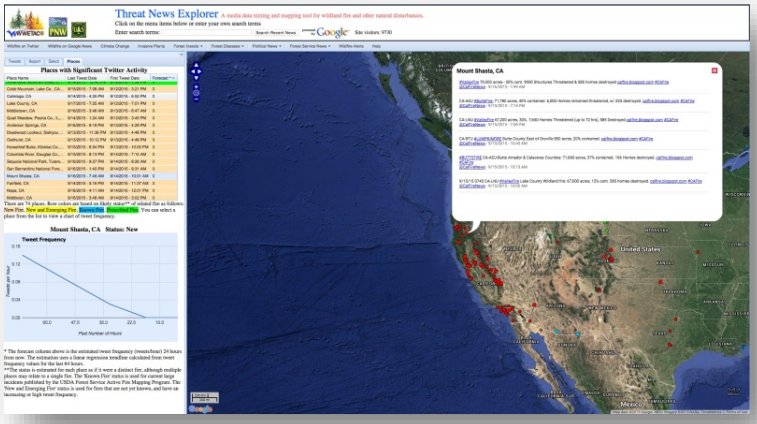
FY 2015 Accomplishments

Develop, improve, and increase production & use of decision support products

The WFM RD&A, in collaboration with the Forest Service, the Office of Wildland Fire (OWF) and Bureau leadership, continues to lead development of the Interagency Fuels Treatment Decision Support System (IFTDSS). While IFTDSS will remain in beta status until 2017, significant updates to functionality and user experience continue to occur. For example, treatment-based fuel model changes based on LANDFIRE Fuel Model Transition tables and interaction with the Fuels Treatment Effectiveness Monitoring (FTEM database) have been incorporated to facilitate end-user identification of treatment and wildfire interactions. IFTDSS is currently under transition to a cloud hosted environment and a new Development contract will be awarded in December of 2015.

Enhancements and essential improvements have continued with regard to the Wildland Fire Decision Support System (WFDSS). Numerous upgrades have been made to work toward meeting Section 508 requirements to be fully accessible to persons with disabilities. Other features have been added to increase user functionality and support risk based decision making.

Work to modify the Incident Risk Console (RisC), a part of the Fire Enterprise Geospatial Portal, to account for and display fires that are part of a complex was initiated to continue to seek ways for this product to be of use to national and regional fire managers.



TwitterFire Maps Tweets About Wildfires

WFM RD&A staff have been mining tweets about wildfires from Twitter's enormous pool of data to develop an early warning system for new and emerging wildfires. Staff and contractors have built a web app called TwitterFire to support this concept. Every 15 minutes TwitterFire relies on a custom built search algorithm to examine an average of 5,250,000 tweets and narrow the data down to only those likely to be talking about a wildfire in the United States. The tweets are then mapped using Yahoo's Placemaker Application Program Interface (API) and used to drive a notification system which sends emails and/or text messages to registered users when a threshold is met for a specific geographic location. View the TwitterFire Web App from the Threat News Explorer here: *http://wwetac.us/tne/tne.html*

Working with meteorologists from the Environmental Modeling Center within the National Oceanic and Atmospheric Administration (NOAA), scientists from the Missoula Fire Science Lab and fire meteorologists, the WFM RD&A initiated a project to generate and store three decades of gridded weather. This will provide a gridded weather product that can be used as inputs for the fire behavior models in WFDSS and other applications. The higher quality inputs should have a significant impact on producing more accurate results from the WFDSS fire behavior models. Work began on the re-analysis in 2015 and a subset of several years of data will be provided to the WFM RD&A in early 2016. Pending testing and validations, the WFDSS could be utilizing the gridded data for the 2017 fire season.

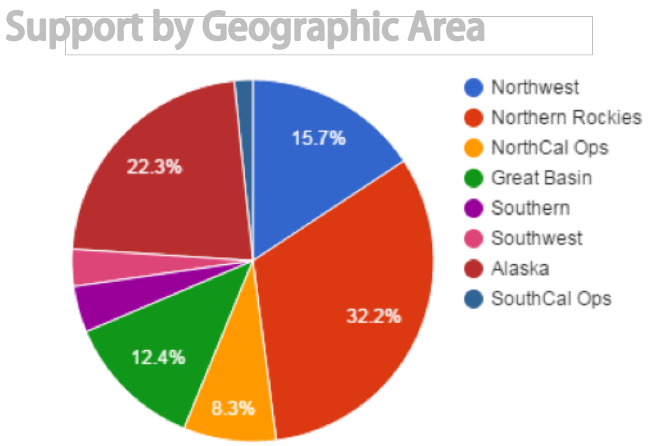
Provide mentoring and other means to strengthen decision support capacity

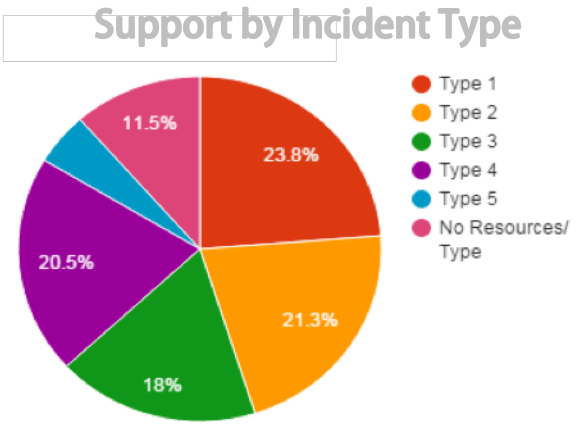
The WFM RD&A hosted three mentees and two detailers in FY 2015. Mentees worked with WFM RD&A staff and were provided opportunities to gain and improve skills in fire analysis and assessment for ongoing wildfire incidents. Detailers worked on advancement of the Interagency Fuels Treatment Decision Support System and WFDSS Help documentation and user guides. Detailer efforts provided for accomplishment of critical work while providing training and experience.

Refresher materials and online webinars were available for WFDSS users and agency administrators to provide continued support and strengthening of decision capacity. In an effort to improve user understanding of WFDSS as a tool for risk assessment, real world example decisions were drafted and shared, critiques of existing decisions were provided, and incident objectives were evaluated for clarity and consistency.

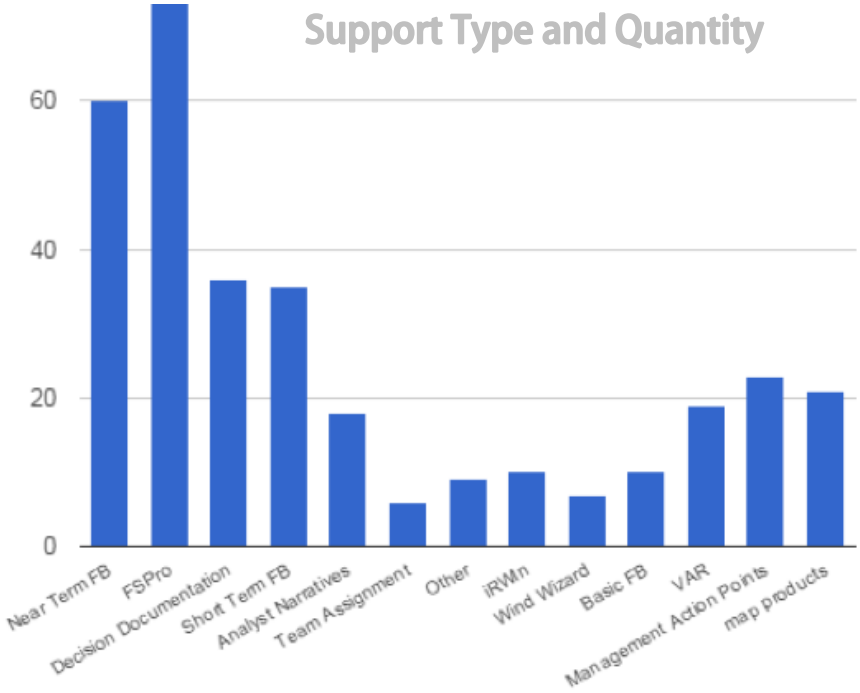
Provide decision support analyses

Staff supported 122 incidents, primarily in the Northern Rockies and Alaska, although eight Geographic Areas received support in all. Support was provided to large and small fires in varying complexities and included

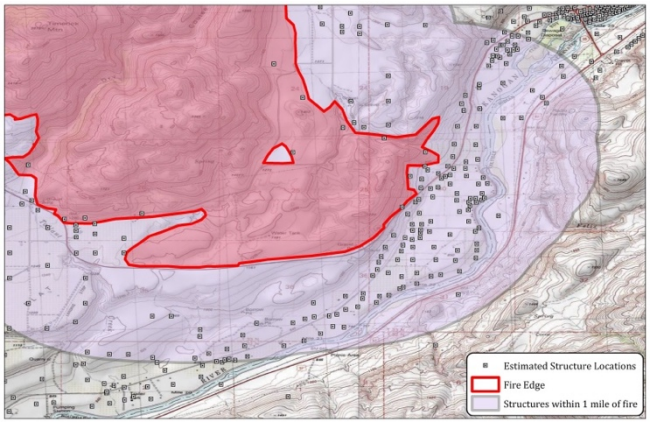




fire behavior products, decision support assistance, and a range of other services and products. Forty-nine individuals were mentored and coached by WFM RD&A staff in direct support of incidents. Direct, on-scene support was also provided to the Northern Rockies Multi-Agency Coordination (MAC) Group during the height of that region's fire season, and to Area Commands in California and Washington.



Data was utilized this year to estimate the number of structures threatened by wildfires in FS Region 6 as compared to known structural losses. Although exact numbers will not be available, a sense of the success achieved in suppressing these unwanted wildfires was gained. This was a new process utilizing county cadastral and Structure Address data shared through agreements between federal, county, and state governments to provide values-at-risk data for the Wildland Fire Decision Support System (WFDSS). These inter-governmental partnerships are yielding improvements in Cadastral, and more recently Structure Address data quality which may assist managers in the future for ICS209 reporting, developing success stories for incidents, and evaluating decisions.



Data Used to Assess Values-at-Risk

Integrate new knowledge into existing wildland fire curricula

Staff continue to inject new research and concepts into workshops and courses during trainings. Staff are integral in the mentoring, coaching, and teaching at both S590 and S495. Skills and concepts in fire behavior analysis were discussed and taught at the Human Dimensions in Safety and Wildland Fire Conference, in Boise, Idaho. Staff helped coordinate two workshops relating to risk assessment and fuel treatments.

Staff participated in planning and attended the first Risk Summit, December 2014, bringing together researchers, line officers, managers, training specialists and fire scientists. Several task groups were formed including one on Terminology, in which members including the WFM RD&A are working to define and adopt common terminology and understanding regarding risk in wildland fire. An additional summit was planned for December 2015 to follow up and further progress in consistent risk management philosophies and actions.

Provide a link between scientists and field managers & serve as advisors to program administrators

The WFM RD&A has partnered with numerous agencies, universities, organizations, and committees in efforts to link scientists and field managers. An example of such is the staff's work with NWCG subcommittees. The Fire Danger Subcommittee completed significant revisions to the Red Book concerning how to apply fire danger products to Fire Danger Operating Plans. The units Fire Danger Operating Plans affect many aspects of daily fire management such as when to implement fire restrictions or how to determine staffing levels. In coordination with the Fire Behavior Subcommittee the WFM RD&A supported safety zone research and helped secure funding for continued research. Support was provided for an online NWCG sanctioned Behave Training course to provide consistency and continuity in training and preparing the field for higher-level coursework.

***A full report of the 2015 WFM RD&A activities is available at *www.wfmrda.nwcg.gov*

FY 2016 Planned Activities

Foster fire management decision support systems that are risk based, relevant, timely, and integrated, including planning (fuels) and incident response:

- Support interagency Spatial Fire Planning efforts.
- Test, identify, and suggest developments to emerging risk and decision making applications including the Incident Risk Console (RisC) and TwitterFire.
- Partner with the RMRS Fire Economics Research group to continue development of "prototype forest" example.
- Collaborate with Innovations Project staffs to validate and improve Scientific Modeling Framework and to develop and test new Integrated Interagency Data systems.
- Maintain, test, identify and suggest WFDSS application enhancements, including transition to new contactor.
- Test, identify, and suggest developments to the IFTDSS application.

Conduct technology transfer activities that foster innovation, improve risk-based decision making and promote the use of these tools by interagency wildland fire community:

- Train the wildland fire community in utilization of the products we create and sponsor: NWCG courses, support Advancement Fire Behavior Learning Unit, develop tech and user guides, mentor field, and provide refresher materials.
- Continue support to international partners through USAID and other means.
- Increase customer awareness of the Rocky Mountain Center and integrate their products into wildland fire management systems: oversee and participate in the RMC steering committee, upgrade RMC webpage, develop Alaska fire weather products, and a system of predictive equations for large fire probabilities for Predictive Services.
- Improve technical transfer mechanism for broader audiences: provide technology transfer regarding Quantitative Risk Analysis Framework information, promote interagency data coordination and standards, test alternative methods to create Delegations of Authority and Leader's Intent Briefing Packages, maintain Fuel and Fire Planning Portal, continue involvement and support of interagency committee and working group that promote and further objectives.
- Provide daily support to ongoing fire incidents, remote and on-site as needed regarding decisions and fire behavior.

The WFM RD&A connects with stakeholders to modify projects and evaluate future needs:

- Coordinate with Geographic Area Editors and Fire Planners to understand and meet management needs.
- Work with researchers to ensure latest science is relevant and applicable to field needs: Safety Zone Research, Haines Index research, Fire Behavior Extremes project, Quantitative Risk Analysis Framework, Mesoscale Reanalysis for Gridded Weather Project.
- Work with Washington Officer to ensure national interagency coordination: Red Book guidance, Line Officer's Desk Reference maintenance, National Line Officer's Team coordination, and develop and promote Risk terminology.
- Communicate with collaborators and audiences regarding WFM RD&A functions: 2016 IAWF conference, Association of Fire Ecology Conference, disseminating Annual Accomplishments, website maintenance, committee participation.
- Renew the WFM RD&A and National Fire Decision Support Center Charter and Service Level Agreement.

Cooperative Agreements and Partnerships

- University of Kentucky, Department of Mechanical Engineering
- University of Maryland, Department of Fire Protection Engineering

Presentations

- S. McAllister, "Crown fires and live fuels," Guest seminar and lecture for ENFP 489W/689W: Wildland Fires: Science and Applications course in the Fire Protection Engineering Department at the University of Maryland, College Park, December 4, 2014.
- S. McAllister, "Forest Service fundamental research – taking a closer look at the burning rate of porous fuel beds," Guest seminar at the University of Alabama, Huntsville, January 30, 2015.
- S. McAllister and M. Finney. "Effect of layout and below-bed ventilation on burning rate of porous fuel beds," VII International Conference on Forest Fire Research, Coimbra, Portugal, November 17-20, 2014. (also published as 4.D.1 #30)
- S. McAllister, M. Finney, T. Maynard, I. Grob. "A study of ignition by rifle bullets," Fire and Materials 2015: 14th International Conference and Exhibition, San Francisco, CA, February 2-4, 2015. (also published as 4.D.1 #33)
- S. McAllister, M. Finney. "The effect of wind on the burning rate," Operation Tomodachi – Fire Research Meeting, National Institute of Standards and Testing, Gaithersburg, MD, March 16-18, 2015.
- S. McAllister, M. Finney. "Convective ignition of wood cylinders," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20, 2015. (also published as 4.D.1 #36)
- S. McAllister, D. Weise. "Effects of season on ignition of live wildland fuels using the FIST apparatus," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20, 2015 AND 9th Mediterranean Combustion Symposium, Rhodes, Greece, June 7-11, 2015. (also published as 4.D.1 #35, 37)
- S. McAllister, M. Finney. "The effect of wind on the burning rate," 2nd European Symposium on Fire Safety Science, Nicosia, Cyprus, June 16-18, 2015. (poster) (also published as 4.D.1 #38)
- S. McAllister, M. Finney. "Ignition temperatures of wood cylinders under convective heating," Western States Section of the Combustion Institute – Fall 2015 Meeting, Provo, UT, October 5-6, 2015. (also published as 4.D.1 #41)
- 2015. May. Finney, invited keynote address to the International Conference on Fire Behavior and Risk, on "Laboratory Experiments Lead to New Understanding of Wildfire Spread", presented in Alghero, Sardinia, Italy.
- 2015. June. Finney, public presentation of Landscape Considerations for Fire and Fuel Management in Helena, evening of June 10th at the request of the Helena National Forest.
- 2015. September. Finney, invited keynote address to the Australasia Fire and Emergency Services Authorities Council (AFAC) on "How do wildfires spread? Experimental research yields new insights", presented in Adelaide, Australia at the AFAC Bushfire Hazards CRC meeting. Invited by Dr. Richard Thornton, CEO, Bushfire CRC.
- 2015. October. Finney, invited keynote to the Western States Section of the Combustion Institute held in Provo, Utah on buoyant instabilities and flame spread in wildland fires. Invited by Prof. David Lignell, Dept. of Chemical Engineering.
- 2015. October. Finney, Invited evening lecture to the Missoula Chapter of the Society of American Foresters on wildfire behavior research. Invited by Dylan Brown, Resource Forester, Pyramid Mountain Lumber.
- 2014, November. C. McHugh. Seminar to fire management class at the Univ. Montana on fire regime mapping and comparisons of contemporary and historical burning rates.
- 2015, March. C. McHugh. Comparing sling psychrometer and Kestral readings in a controlled environment at the Northern Rockies Fire Behavior Workshop.

- 2015, June. C. McHugh. Presentation to the Montana Forest Restoration Committee covering historical fire regimes, problem fires, and fire modeling for fuel treatment design.
- 2015, June. C. McHugh. Presentation to the National Weather Service Incident Meteorologist (IMET) on a study comparing humidity and temperature sensors.

Workshops

- 2015, April Mytilini, Greece, Mark Finney and Bob Keane presented seminars on fire risk analysis at the University of the Aegean.
- 2015, April, S495, C. McHugh served as steering committee member and course instructor.

Technology Transfer

- Chuck McHugh performed modeling and analysis of the Twisp River fire 8/2015, for the Coordinated Response Protocol review.

Publications

- S. McAllister and M. Finney. "Effect of layout and below-bed ventilation on burning rate of porous fuel beds," VII International Conference on Forest Fire Research, Coimbra, Portugal, November 17-20, 2014. (paper available to conference attendees)
- S. McAllister, M. Finney, T. Maynard, I. Grob. "A study of ignition by rifle bullets," Fire and Materials 2015: 14th International Conference and Exhibition, San Francisco, CA, February 2-4, 2015. (paper available to conference attendees and for purchase online)
- S. McAllister, D. Weise. "Effects of season on ignition of live wildland fuels using the FIST apparatus," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20, 2015. (paper available to conference attendees)
- S. McAllister, M. Finney. "Convective ignition of wood cylinders," 9th U.S. National Combustion Meeting, Cincinnati, OH, May 17-20, 2015. (paper available to conference attendees)
- S. McAllister, D. Weise. "Effects of season on ignition of live wildland fuels using the FIST apparatus," 9th Mediterranean Combustion Symposium, Rhodes, Greece, June 7-11, 2015. (paper available to conference attendees)
- S. McAllister, M Finney. "The effect of wind on the burning rate," 2nd European Symposium on Fire Safety Science, Nicosia, Cyprus, June 16-18, 2015. (paper available to conference attendees)
- Finney, M.A., J.D. Cohen, J.M. Forthofer, S.S. McAllister, M.J. Gollner, D.J. Gorham, K. Saito, N.K. Akafuah, B.A. Adam, J.D. English. 2015. Role of buoyant flame dynamics in wildfire spread. Proc. Nat. Acad. Sci. www.pnas.org/cgi/doi/10.1073/pnas.1504498112 112(32):9833-9838.
- Finney, M.A., McAllister, S., T. Maynard, I. Grob. 2015. A study of wildfire ignition by rifle bullets. Fire Technology DOI: 10.1007/s10694-015-0518-6.
- Cohen, J.D. 2015. Fuel particle heat exchange in wildland fire spread. Ph.D. Dissertation, University of Idaho.
- McHugh, C.W. S. Hoyt, and B. Fay. 2015. Strategic Operations Planning – its not just for wilderness! How the strategic operations planner can help. In Keane, R.E., Jolly, M. Parsons, R., Riley, K. Proc. Large wildland fires conference May 19-23, 2014, Missoula MT. RMRS-P-73. Ft. Collins CO pp 156-162.
- Mangeon, S., R.Field, M. Fromm, C. MChugh, and A. Voulgarakis. 2015. Satellite versus ground-based estimates of burned area: a comparison between MODIS based burned area and fire agency reports over North America in 2007. The Anthropocene Review DOI: 10.1177/2053019615588790

Cooperative Agreements and Partnerships

- Oregon State University
- University of Montana
- Colorado State University
- Southern Research Station
- Pacific Southwest Research Station
- US Geological Survey
- The Nature Conservancy

Presentations

- Calkin, D., M. Hand, H. Katuwal, C. Stonesifer, M. Thompson, and T. Holmes. 2014. Large fire suppression effectiveness and resource use. Wildfire Lessons Learned Center. October 8, 2014. Webinar presented by Calkin. Available at: https://www.youtube.com/watch?v=ITE6YKhGwKU&feature=youtube
- Calkin, D., M. Thompson. 2014. Managing wildfire risk and uncertainty: the need for transformation of wildfire management in the US. Risk and Uncertainty in Forest Ecosystem Dynamics Workshop hosted by Beijing Forestry University. Beijing, China, October 14, 2014. Presentation by Calkin.
- Calkin, D.E., J.D. Cohen, M.A. Finney, and M.P. Thompson. 2014. Risk assessment to achieve fire adapted communities in the US. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Calkin.
- Calkin, D.E., M.S. Hand, H. Katuwal, and M.P. Thompson. 2014. The effectiveness of suppression resources in large fire management in the US. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Calkin.
- Calkin, D. 2015. The application of risk management principles to mitigate the potential for wildland urban interface disasters. California Fire Science Consortium. January 15, 2015. Webinar presentation by Calkin.
- Calkin, D. 2015. Breaking the cycle of increasing wildfire risk. International Conference on Fire Behaviour and Risk (ICFBR2015). Alghero, Italy, May 26-29, 2015. Keynote lecture by Calkin.
- Hand, M.S., M.P. Thompson and D.E. Calkin. 2014. Development and application of wildfire suppression expenditure models for decision support and landscape planning. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Hand.
- Hand, M.S, H. Katuwal, D. Calkin. "The influence of incident management teams on suppression resource use." Invited seminar, Missoula FireLab Seminar Series, Missoula, MT, March 12, 2015.
- Hand, M.S., D.E. Calkin, and H. Katuwal. The Influence of Incident Management Teams on Suppression Resource Use. International Association of Wildland Fire Safety and Human Dimensions Conference. Boise, ID. April 21, 2015. Oral presentation by Hand.
- Hand, M.S, J. Gilbertson-Day, L. Peltz-Lewis, D. Calkin. "Allocation of wildfire suppression costs: A case study of direct protection agreements in California." Selected paper at Western Forest Economists meeting, Vancouver, BC, June 1, 2015.
- Katuwal, H., M. Hand*, D. Calkin. "Suppression resources for large wildland fire suppression during extended attack." Selected paper at Western Forest Economists meeting, Vancouver, BC, May 31, 2015.
- Riley, K.L., C. Stonesifer, H. Preisler, and D. Calkin. 2014. Predicting wildfire ignitions, escapes, and large fire activity using Predictive Service's 7-Day Fire Potential Outlook in the western USA. VII International Conference on Forest Fire Research. November 17-20, 2014, Coimbra, Portugal.
- Riley, K.L., I.C. Grenfell, M.A. Finney, and N.L. Crookston. 2014. Utilizing random forests imputation of forest plot data for landscape-level wildfire analyses. VII International Conference on Forest Fire Research. November 17-20, 2014, Coimbra, Portugal.
- Riley, K.L. and J. Haas. 2014. Predicting effect of climate change on large fire size and counts using the Large Fire Simulator (FSim). 2014 Society of American Foresters National Convention. Society of American Foresters. October 9-11, 2014, Salt Lake City, Utah.

- Riley, K.L., I. Grenfell, and N. Crookston. 2014. Random forests imputation of forest plot data for landscape-level analyses. 2014 Society of American Foresters National Convention. Society of American Foresters. October 9-11, 2014, Salt Lake City, Utah.
- Riley, K., M.P. Thompson, J. Scott, D.E. Calkin, and M. Hand. Advancements in Spatial Wildfire Risk Analysis. International Conference on Fire Behaviour and Risk (ICFBR2015). Alghero, Italy, May 26, 2015. Oral presentation by Calkin.
- Short KC. Sources and implications of bias and uncertainty in a century of US wildfire activity data. Presented at: Wildland Fire Management RD&A Seminar Series; 5 March 2015; Missoula, MT.
- Short KC. Integrating wildfire data from federal, state, and local reporting systems. Presented at: Fire Management in the 21st Century: Working Toward Common Goals. 49th Annual Meeting of Northeast Forest Fire Supervisors; 16-19 June 2015; Dedham, MA.
- Stonesifer, C.S., D.E. Calkin and M.P. Thompson. Quantifying Aviation Accident Risk in Wildfire Suppression. International Association of Wildland Fire Safety and Human Dimensions Conference. Boise, ID. April 23, 2015. Oral presentation by Stonesifer.
- Stonesifer, C.S., Thompson, M.P., Salis, M., and D.E. Calkin. Flexible Design of Helicopter Basing Strategies in Sardinia, Italy. International Conference on Fire Behaviour and Risk (ICFBR2015). Alghero, Italy, May 26, 2015. Oral presentation by Stonesifer.
- Thompson, M.P. 2014. Probabilistic Wildfire Suppression Cost Modeling: Methods, Applications, and Opportunities. Society of American Foresters National Convention, Salt Lake City, UT, October 8-11, 2014.
- Thompson, M.P., M.S. Hand, J.D. Rieck, J. Haas, and D.E. Calkin. 2014. The impacts of treated landscapes on suppression cost effectiveness. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Thompson.
- Thompson, M.P., C.S. Stonesifer, and D.E Calkin. 2014. Large airtanker use in the United States: What do we know. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Thompson.
- Thompson, M.P., J.H. Scott, J. Gilbertson-Day, J.R. Haas, and D.E. Calkin. 2014. Expanding the horizons of wildfire risk management. VII International Conference on Forest Fire Research. Coimbra, Portugal. November 17-20, 2014. Oral presentation by Thompson.
- Thompson, M.P., Riley, K., Hand, M., and J. Scott. Improved Spatial Fire Economics Modeling. Western Forest Economists Meeting, Vancouver, BC, May 31 – June 2, 2015.

Publications

- Calkin, D.E. and M. Mentis. 2015. The use of natural hazard modeling in highly uncertain environments. Forest Ecosystems. 2:11. doi:10.1186/s40663-015-0034-7.
- Calkin, D.E., M.P. Thompson, and M.A. Finney. 2015. Negative consequences of positive feedbacks in US wildfire management. Forest Ecosystems. 2:9: doi:10.1186/s40663-015-0033-8.
- Calkin, D. and M. Thompson. 2015. Defining the right objective at the right scale for wildfire risk management. Wildfire Magazine. July/August 2015.
- Jin, Y., M. Goulden, N. Faivre, S. Veraverbeke, F. Sun, A. Hall, M. Hand, S. Hook, J. Randerson. 2015. Identification of Two Distinct Fire Regimes in Southern California: Implications for Economic Impact and Future Change. Environmental Research Letters, 10(9): 094005.
- Riley, K., C. Stonesifer, D. Calkin, and H. Preisler. 2015. Assessing Predictive Services' 7-day potential fire forecast. In: Keane, Robert E.; Jolly, Matt; Parsons, Russell; Riley, Karin. 2015. Proceedings of the large wildland fires conference; May 19-23, 2014; Missoula, MT. Proc. RMRS-P-73. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Pp: 187-194.
- Riley, K.L., C.S. Stonesifer, and D.E. Calkin. 2014. Predicting wildfire ignitions, escapes, and large fire activity using fire potential forecasts in the Western USA. In Advances in Fire Research. Domingo Xavier Viegas Editor. http://dx.doi.org/10.14195/978-989-26-0884-6.
- Scott, J.H., Thompson, M.P., and Gilbertson-Day, J.W. 2015. Exploring how alternative mapping approaches influence fireshed assessment and human community exposure to wildfire. GeoJournal.

- Scott, J.H., and M.P. Thompson. 2015. Emerging concepts in wildfire risk assessment and management. In Proceedings of the Large Wildland Fires: Social, Political & Ecological Effects Conference, RMRS-P-73, Fort Collins, CO. P. 196-206.
- Short KC (2015) Sources and implications of bias and uncertainty in a century of US wildfire activity data. International Journal of Wildland Fire 24, 883-891. *http://dx.doi.org/10.1071/WF14190*
- Short KC (2015) Spatial wildfire occurrence data for the United States, 1992-2013 [FPA_FOD_20150323]. 3rd Edition. Fort Collins, CO: Forest Service Research Data Archive. http://dx.doi.org/10.2737/RDS-2013-0009.3.
- Stonesifer, C.S., Thompson, M.P., Calkin, D.E., and C.W. McHugh. Characterizing Large Airtanker Use in United States Fire Management. In Proceedings of the Large Wildland Fires: Social, Political & Ecological Effects Conference, RMRS-P-73, Fort Collins, CO. P. 314-316.
- Thompson, M.P. 2015. Decision Making under Uncertainty: Recommendations for the Wildland Fire Decision Support System (WFDSS). In Proceedings of the Large Wildland Fires: Social, Political & Ecological Effects Conference, RMRS-P-73, Fort Collins, CO. P. 317-319.
- Thompson, M.P., and N.M. Anderson. 2015. Modeling Fuel Treatment Impacts on Suppression Cost Savings: A Review. California Agriculture 69(3): 164-170.
- Thompson, M.P., Freeborn, P.H., Rieck, J.D., Calkin, D.E., Gilbertson-Day, J.W., Cochrane, M., and M.S. Hand. 2015. Quantifying the Influence of Previously Burned Areas on Suppression Effectiveness and Avoided Exposure: A Case Study of the Las Conchas Fire. International Journal of Wildland Fire.
- Thompson, M.P., Gilbertson-Day, J.W., and J.H. Scott. 2015. Integrating pixel- and polygon-based approaches to wildfire risk assessment: application to a high-value watershed on the Pike and San Isabel National Forests, Colorado, USA. Environmental Modeling & Assessment.
- Thompson MP, Haas JR, Finney MA, Calkin DE, Hand MS, Browne MJ, Halek M, Short KC, Grenfell IC (2015) Development and application of a probabilistic model for wildfire suppression cost modeling. Forest Policy and Economics 50, 249-258. doi:10.1016/j.forpol.2014.10.001.
- Thompson, M.P., Haas, J.R., Gilbertson-Day, J.W., Scott, J.H., Langowski, P., Bowne, E., and D.E. Calkin. 2015. Development and application of a geospatial wildfire exposure and risk calculation tool. Environmental Modelling & Software 62: 61-72.
- Thompson, M.P., J.H. Scott, J. Gilbertson-Day, J.R. Haas, and D.E. Calkin. 2014. Expanding the horizons of wildfire risk management. In Advances in Fire Research. Domingo Xavier Viegas Editor. http://dx.doi.org/10.14195/978-989-26-0884-6.
- Thompson, M.P., and J.J. Warmink. [In Press] Natural Hazard Modeling & Uncertainty Analysis. In Webley, Riley, and Thompson (eds.) Natural Hazard Assessment: Uncertainty Modeling and Decision Support.

Cooperative Agreements and Partnerships

- Air Fire Program, Pacific Northwest Research Station, *http://www.airfire.org*
- LANDFIRE Program, *www.landfire.gov*
- Cooperative agreement and development of Board of Directors for oversight of DOI Fire Application Specialists and their participation in the WRM RD&A and the NFDSC
- Desert Research Institute (DRI), *http://www.dri.edu/*
- National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service (NWS)
- Fire, Fuel, and Smoke Science Program, RMRS, *http://firelab.fire.org*
- Human Dimensions Program, RMRS
- University of Idaho Wildland Fire Science Program
- University of Idaho Cost Reimbursable Agreement
- Fire Research And Management Exchange System (FRAMES)- University of Idaho,*www.frames.gov*
- National Center for Landscape Fire Analysis (NCLFA)-University of Montana, *http://firecenter.umt.edu*
- Department of Interior- Office of Wildland Fire Coordination (OWFC), *www.doi.gov/pmb/owf*
- Bureau of Indian Affairs (BIA)
- Bureau of Land Management (BLM)
- Fish and Wildlife Service (FWS)
- National Park Service (NPS)
- US Geological Survey (USGS)
- Joint Fire Science Program (JFSP), *www.firescience.gov*
- Northern Rockies Fire Science Network, *http://nrfirescience.org*
- National Wildfire Coordinating Group (NWCG), *www.nwcg.gov*
- National Predictive Service Program (NIFC), *www.predictiveservices.nifc.gov*
- USFS Fire & Aviation *http://www.fs.fed.us/fire*
- Pacific Southwest Research Station, *www.fs.fed.us/psw*
- Pacific Northwest Research Station, *www.fs.fed.us/pnw*
- The Nature Conservancy (TNC), *www.nature.org*
- International Association of Wildland Fire (IAWF)

Presentations

- “Risk Management in the U.S. Forest Service- Past, Present and Future” 2nd International Conference on Fire Behaviour and Risk, Alghero, Sardinia, Italy, May 26-29
- “The Evolution of the Wildland Fire Decision Support System (WFDSS): Future Direction After Five Years of Implementation.” 7th International Conference on Forest Fire Research, Coimbra, Portugal, November 14-21
- “Risk Assessment and the Interagency Fuels Treatment Decision Support System- IFTDSS.” Oral presentation given at the Wildfire Risk and Fuel Treatment Analysis Workshop, January 27-29, 2015, Missoula, MT
- “Data Management Supporting Decision Making on Wildland Fires”, National Society of American Foresters and International Union of Forest Research Organizations Convention, October 6-10, 2014
- IFTDSS Presentation to USFS Regional Fire Planners and Fuels Specialists, April 30th, 2015, Atlanta, GA
- Spatial Fire Planning Presentation to USFS Regional Fire Planners and Fuels Specialists, April 30th, 2015, Atlanta, GA
- “Incident Risk Console (RisC).” Managing Fire, Understanding Ourselves: Human Dimensions in Safety and Wildland Fire, Boise Idaho April 2015

Presentations Cont.

- Fire Planning and Fuels Management Portal Presentation to USFS Regional Fire Planners and Fuels Specialists, April 30th, 2015, Atlanta, GA
- WFDSS Updates and Spatial Fire Planning, Northwest Fire Planners Meeting, Bend, Oregon, January 13-15th
- WFDSS Overview and Use, Webinar with Washington Dept. of Natural Resources, November
- IFTDSS Overview, Burn Boss Refresher, John Day, Oregon, April 28th
- IFTDSS Briefing, Fire Behavior Subcommittee Meeting, Bend, Oregon, April 29th
- Presentation and Briefing to Australian Fire Representatives regarding WFDSS at NIFC, August, 2015
- "Improving Risk Assessment Through Fire Behavior Analysis Workshop," Human Dimensions in Safety and Wildland Fire, Boise, Idaho April 20th
- Fire Director WFDSS Briefing June 2015, NLOT, Coach Shadow program and Line Officer Tools webpage
- Keynote presentation on Risk Management at Southwest, Northern Rockies, Great Basin and Pacific Southwest Regional Incident Management Team Meeting, Albuquerque, NM, Missoula, MT, Boise, ID and Sacramento, CA April, 2015
- Keynote presentation on Risk Management at the Area Command/Incident Command team meetings Phoenix, AZ March, 2015.

Workshops/Conference Attendance

- Association of Southeast Asian Nations (ASEAN) Workshop on Peatland Fire Management under Regional Haze, December 7th-10th, Singapore, Singapore
- Managing Fire, Understanding Ourselves: Human Dimensions in Safety and Wildland Fire, Boise Idaho April 20-24, Planning Committee and Attendance
- 2nd International Conference on Fire Behaviour and Risk, Alghero, Sardinia, Italy, May 26-29
- 7th International Conference on Forest Fire Research, Coimbra, Portugal, November 14-21
- National Society of American Foresters and International Union of Forest Research Organizations Convention, October 6-10, 2014
- Canadian Fire Danger Rating System Conference attendee and panel participant, Alaska, October 27-31st
- 2014 USFS- Risk Management Summit, December 9-11, 2014
- Fire Extremes Research Project and Data Evaluation Workshop, in partnership and DRI, Boise, Idaho, February 19, 2015

Training/Course Instruction

- Fire Management Planning Course, Palangkaraya, Central Kalimantan, Indonesia, Nov. 27th-Dec. 6th, 2015
- Wildfire Risk and Fuel Treatment Analysis Workshop, January 27-29, 2015, Missoula, MT
- Technology Transfer of Quantitative Risk Framework Workshop, Missoula and Virtual, July 7-9, 2015
- S495, Geospatial Fire Analysis, Interpretation, and Application, winter/spring, online & Tucson, AZ.
- WFDSS Refresher, Willamette National Forest, Sweet Home, Oregon April 17th, 2015
- WFDSS Refresher, Nez Perce and Clearwater National Forests, May 6th, 2015
- National Fire Management Leadership, Tucson, AZ, March 23, 2015
- S482, Advanced Fire Management Applications, Boise, Idaho, Oct. 21-23, 2014
- S390, Introduction to Wildland Fire Behavior Calculations, Boise, ID, Nov. 18-22, 2014
- USFS Middle Leader Program Coach
- WFDSS Updates and Spatial Fire Planning, NPS East Coast Fire GIS meeting, Raleigh, NC, December, 2014
- WFDSS Update and IRWIN, California Intermediate GISS Class, McClellan, CA, March, 2015
- Rx310, Prescribed Fire Plan Preparation, Great Basin Training Center, Boise, Idaho, March, 2015
- WFDSS Overview, GISS Webinar Refresher courses, February and May, 2015
- BIA WFDSS Refresher, Spring 2015
- WFDSS Data Management Deep Dive Webinars (2), Spring, 2015

Organizational Representation

- NWCG US Forest Service Research Executive Board Representative
- NWCG Fire Behavior Subcommittee Chair
- NWCG Fire Planning Subcommittee Representative
- NWCG Fire Reporting Subcommittee Representative
- NWCG Fire Danger Subcommittee Member
- NWCG Geospatial Subcommittee Chair
- NWCG Data Standards and Terminology Subcommittee Representative
- LANDFIRE Liaison
- Predictive Services/Intelligence Liaison
- Fire Research And Management Exchange System (FRAMES) Liaison
- Air/Fire Group Liaison
- S495 Geospatial Fire Analysis, Interpretation, and Application Steering Committee Chairmen, Cadre, Mentors, Coaches
- S590 Advanced Fire Behavior Interpretation- Steering Committee Chairmen, Cadre, Mentor, Coach
- National Incident Management Organizations (NIMO) Liaison
- Information Technology Advisory Board representative
- Wildland Mobile Technologies Working Group Chair and member
- Northern Rockies Consortium Liaison
- Fire Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS) Representative
- Desert Research Institute (DRI) Liaison
- BLM WFDSS Oversight group
- Interagency Fire Planning Committee Representative
- Incident Risk Console (RisC) WFM RD&A Representative
- Emerging Technologies Group Chair and Representative
- NWCG Fire Environment Committee Representative
- Advanced Fire Environment Learning Unit Chair and Representatives
- National Line Officer Team Liaison
- Southern Fire Exchange Consortia Steering Committee
- Rocky Mountain Center (RMC) Steering Committee

Publications

- Vaillant, N., Noonan-Wright, E., Reiner, A., Ewell, C., Rau, B., Fites-Kaufman, J., and S. Dailey. 2015. Fuel accumulation and forest structure change following hazardous fuel reduction treatments throughout California. International Journal of Wildland Fire. Available online: *http://dx.doi.org/10.1071/WF14082*
- Noonan-Wright, E., Sexton, T., and M. Burgard. 2014. "The Evolution of the Wildland Fire Decision Support System (WFDSS): Future Direction after Five Years of Implementation." in Viegas, Domingo Xavier (ed). Advances in forest fire research. Coimbra, Portugal: [s.n.]. ISBN 978-989-26-0884-6 (PDF)
- Noonan-Wright, E., Opperman, T. 2015. Applying the Wildland Fire Decision Support System (WFDSS) to Support Risk-informed Decision Making: The Gold Pan Fire, Bitterroot National Forest, Montana, USA. Conference Proceedings, Large Wildland Fires; Social, Political & Ecological Effects, Missoula, May, 2014