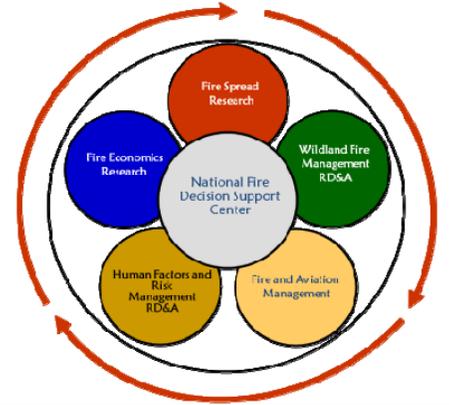


National Fire Decision Support Center: 2011 Annual Report



Contents

Introduction	1
Fire and Aviation Management	2
Fire Economics Research	3
Human Factors & Risk Management RDA	5
Fire Spread Research	7
Wildland Fire Management RDA	9
Appendix	11
Fire Economics Research.....	11
Cooperative agreements/partnerships:.....	11
Publications:.....	11
Presentations oral/poster:.....	12
Projects:	13
Workshops/conference attendance:	13
Training:	13
Organizational representation:.....	14
2012 Planned activities:	14
Human Factors & Risk Management RDA.....	15
Cooperative agreements/partnerships:.....	15
Publications:.....	15
Presentations oral/poster:.....	16
Projects:	16
Workshops/conference attendance:	17
Training:	17
Organizational representation:.....	17
Fire Spread Research.....	17
Cooperative agreements/partnerships:.....	17
Publications:.....	17
Presentations oral/poster:.....	18
Projects:	19
Workshop/conference attendance:.....	19
Training:	19
Organizational Representation:	20
Wildland Fire Management RDA.....	20
Cooperative agreements/partnerships:.....	20
Publications:.....	20
Presentations oral/poster:.....	20
Projects:	21
Workshops/conference attendance:	23
Training:	23
Organizational representation:.....	23
2012 Planned activities:	24

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Introduction

In response to the increasing complexities of fire management the National Fire Decision Support Center (NFDSC) was created in May 2009. The Center, a group of scientists, researchers and practitioners has been operational for the past two years. Complexities of fire management have been and continue to increase in response to rising suppression costs, potential resource impacts (air quality, watersheds), numerous values at risk on the landscape (homes, power lines, dams, etc.) as well as mixed perception and attitudes regarding fire management. The efforts of the NFDSC are to:

- Improve the science basis for large fire decision making
- Improve fire management decision support tools and processes
- Improve agency capability to manage fire expenditures
- Maintain centralized decision support capabilities to conduct decision support and analyses for fires
- Continue development of a safety culture that is highly reliable, resilient, and takes a proactive and systematic approach to managing risk.

The NFDSC provides corporate decision support information and monitoring on wildland fires; directed research on strategic decision making capability and risk modeling; and improved awareness and application of decision support information in risk-informed decision making. The NFDSC is a virtual organization comprised of team members from multiple USFS research and management programs, Department of Interior (DOI), and potentially other cooperator organizations. Existing Forest Service units that provide staff for integration in this effort include: WFM RDA (RMRS, FAM, and DOI involvement); Human Factors and Risk Management RDA (RMRS); Fire Spread Research (Fire, Fuels, and Smoke Program, RMRS); and Fire Economics Research (Human Dimensions Program, RMRS), figure 1. This report describes the NFDSC’s annual accomplishments for fiscal year 2011. The main body of the report provides summary information highlighting projects and programs, while the appendix provides detailed lists of accomplishments.

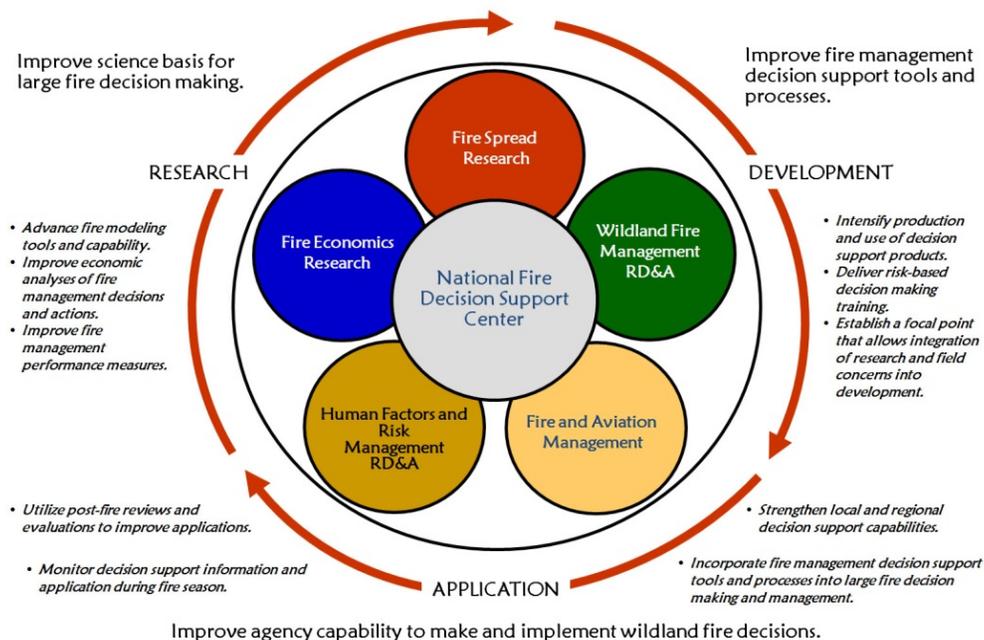


Figure 1: Diagram of the National Fire Decision Support Center

Fire and Aviation Management

Providing the means to accomplish great research, development, and applications

Fire and Aviation Management provides funding and oversight as needed to the other units within the NFDSC. By providing the necessary means to fund the work of the other units, the NFDSC is able to function smoothly, work collaboratively, and produce meaningful and useful research and applications for a wide variety of internal and external audiences.



Inset top: Fire Behavior assessment tool, Basic Fire Behavior, displaying independent calculations of flame length.

Other insets and background: Fire behavior and fire effects. (Pictures courtesy of the National Interagency Fuels, Fire, and Vegetation Technology Transfer (NIFTT)).

● Fire Economics Research

Development and application of risk assessment tools for wildland fire management in 2011

The wildfire economics team strives to be a leader in the development and application of tools for wildfire risk assessment. Fundamentally, the tools identify how wildfire likelihood and intensity interact with highly valued resources, including human life and safety, to create the potential for resource value change (both beneficial effects and losses). The tools also evaluate how investments in fire management affect expected net value change to highly valued resources. The team integrates wildfire behavior projections with spatial values at risk, existing research on resource response to fire, and expert judgment using appropriate decision science methodology. This framework has been useful in promoting the adoption of risk management within federal fire programs.

They led development of the Cohesive Strategy on Fire and Fuels Management Science Report (<http://treesearch.fs.fed.us/pubs/38717>), a collaborative effort involving researchers from the fire behavior research team, the Eastern and Western Threat Assessment Centers, and a senior consultant to F&AM. The Report is a major component of Phase I of the Cohesive Strategy establishing comparative risk assessment as the appropriate framework for analyses of wildfire management issues across all lands within the United States. The wildfire economics team provided support to portions

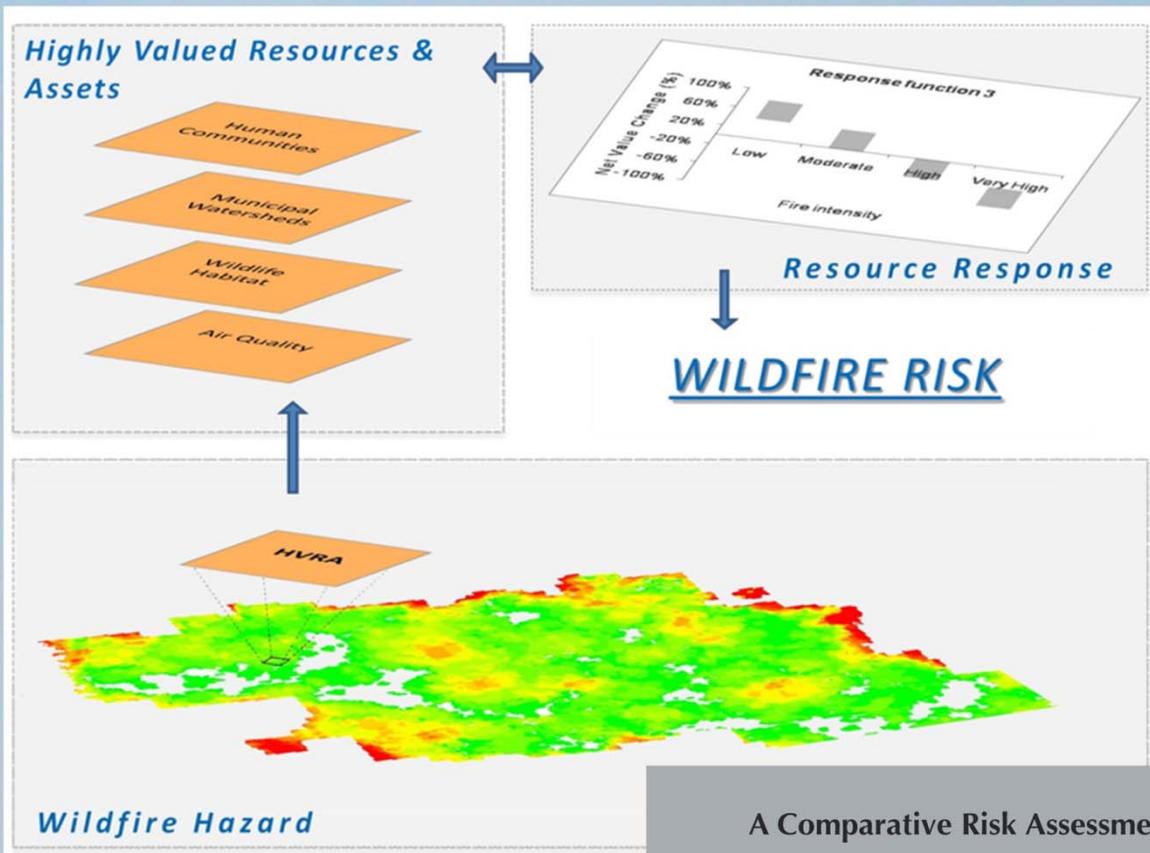
of Phase II, where sub-teams composed of federal and state scientists and managers reviewed the current knowledge and data to identify appropriate frameworks to model individual components of wildfire management.

The team developed and initiated a research agenda to explore methods to evaluate the efficiency of alternative large air tanker fleet designs. They provided consultation to the Washington Office (WO) regarding existing contracts to estimate future aviation needs and participated in contract review to determine future needs and research activities. They have conducted a review of recent usage trends and are developing a spatial dataset to identify large tanker drop locations and fire outcomes.

The team supported the application of risk assessment tools for a variety of projects including: development of analytical methods for the Collaborative Forest Landscape Restoration Program and specialized risk analyses for the Lewis and Clark and Beaverhead - Deerlodge National Forests. The team participated on the Four Mile Fire Science Review requested by Senator Mark Udall (CO) providing leadership on economics and social effects research.

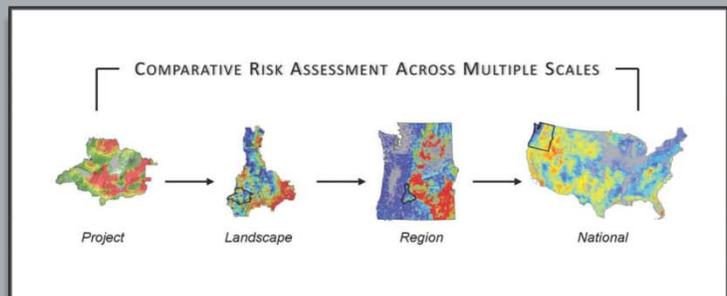
The team provided technical expertise on wildfire suppression cost, suppression resource effectiveness, and guidance on the use of these data and models for wildfire management performance measurement. They provide the annual wildfire cost performance measure report (Stratified Cost Index) for the Forest Service and DOI, and extensive consultation with the WO and FPA on issues related to fire cost, suppression effectiveness, and performance.





A Comparative Risk Assessment Framework for Wildland Fire Management:

The 2010 Cohesive Strategy Science Report



Inset Top: Conceptual model for quantitative, geospatial wildfire risk assessment (credit: Julie Gilbertson-Day)

Inset Bottom: Cover page of team-authored GTR

Background: Las Conchas Fire on the Valles Caldera National Preserve, west of Los Alamos, NM (photo credit: Burt Stalter, Sequoia NF)



United States Department of Agriculture / Forest Service
 Rocky Mountain Research Station
 General Technical Report RMRS-GTR-262
 September 2011

Human Factors & Risk Management RDA

Providing many services

One full-time employee in the Human Factors & Risk Management RDA is supported through the NFDSC, though much of the work conducted by the HFRM complements the NFDSC's broad mission particularly to improve the science basis for decision-making, continuing development of a safety culture that is highly reliable and resilient and taking a proactive approach to managing risk. Many of the HFRM's activities are supplemented by research funds such as the National Fire Plan funds, and awarded through competitive programs such as the Joint Fire Science Program.

Developing a Safety Culture

HFRM staff participated at national and regional levels to develop, pilot and deliver the National Leadership Council's program to reach out to all Forest Service employees through a cascading series of leadership-led *Safety Engagement Sessions*. These 2-day engagement sessions are intended to introduce a more proactive learning approach to safety – a cultural shift expected to ultimately improve both safety and performance across the Agency. HFRM staff were awarded a 2 year grant from the Joint Fire Sciences Program to study learning in the context of prescribed fire. Insights gained from five 2-day dialogue-based inter-agency workshops are being used to inform revision of the Interagency Prescribed Fire Guidebook, as well as identify cultural and structural techniques to improve organizational learning from any and all post-incident reviews. In 2012, staff will continue to mine this data, producing scholarly articles advancing the theories of performance, safety and resiliency and practitioner-oriented materials. Topics include planning, implementing and learning from fire used for resource benefit.

Improving the science basis for decision-making

HFRM staff provide key support for management of a series of research joint ventures investigating the social science basis of decision-making. Specific theoretical investigations in health and human services, economics/policy, resiliency engineering and communications are advancing our understanding of mindfulness, high reliability theory, and organizational performance. Three of these RJVA's are also supporting graduate-level studies (2 PhD's, 2 Master's). The PhD studies focus on developing innovations to assist ground fire-fighters in improving individual and collective 'mindfulness', and understanding the relationship between 'sense-making' and hazard identification in fire crews.

Incident Management Organization Succession Planning

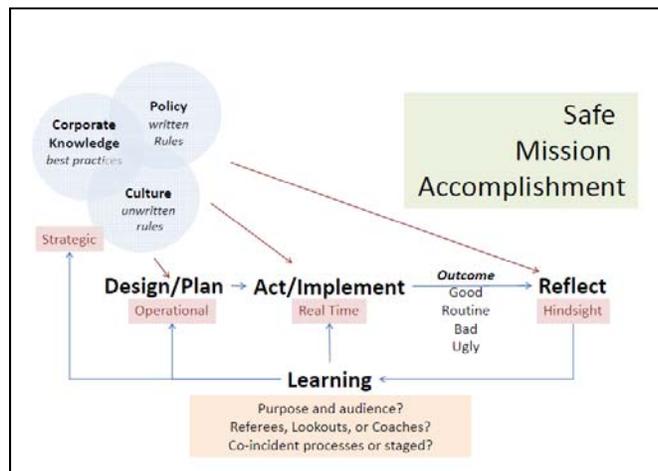
Managing wildland fire, particularly large complex incidents, requires constant adaptation in response to evolving environmental, social and organizational conditions. Currently one of the most challenging is workforce succession – ensuring sufficient qualified personnel are available to manage these events. Understanding the organizational environment is key to facilitate change effectively. In 2011, HFRM staff provided assistance to the NWCG's Incident Management Organization Succession Planning Team by designing, collecting, analyzing, and presenting inter-agency stakeholder feedback on options for revising national Incident Management Team structure, governance, workforce planning and development. This information is being used by the National Wildfire Coordination Group (NWCG)'s Executive Board to assist them in developing a recommendation for its member Agencies. It will also be used to assist in implementing the final decision.

Learning from Escaped Prescribed Fire Reviews

A Joint Fire Science Program Project
(JFSP # 10-1-05-1)

PI's: Anne Black, Dave Thomas,
Jim Saveland
Jennifer Ziegler

	Event	Review Process	Review Product	Transfer Activities
Individual	✓	✓	✓	✓
Burn Team	✓	different audiences, different lessons, different phases		
Review Team				
Peers/Units			✓	✓
Organization		✓		



Joint fire science funded "Learning from Escaped Prescribed Fire Reviews (Anne Black, Dave Thomas, Jim Saveland, and Jennifer Ziegler).

● Fire Spread Research

The Physics of fire

Fire Spread Research continues to explore the finer details of fire spread including studies of flame structure, particle heating, and ignition requirements for dead and live fuels and their contribution to fire spread.

Flame Structure

Artificial fuel sources are constructed to study the combustion interface inside a fuel bed (grasses, shrubs, and tree canopies) where the flame front provides the source of intermittent flame contact with unburned fuel particles. The research team has constructed laboratory experiments to allow measurement and analysis of high frequency temperature variations at the leading edge of the fire. Cooperators at Brigham Young University (BYU) are comparing these results with modeling by the One Dimensional Turbulence (ODT) technique to evaluate the utility of ODT for characterizing convective heating in fire spread. Ultimately, this research will lead to characterizing the convective contribution to particle ignition and fire spread.

Particle Heating in Spreading Fires

Contrary to most modeling assumptions for crown or surface fires, experiments and modeling have shown that fine fuel particles

(grass, needles, etc.) are difficult to ignite from thermal radiation emitted ahead of spreading fires. Fuel particles receive radiation but only at very short ranges (cm-to m) because of optical attenuation within the fuel bed. Even when exposed to the full radiant flux, convective

cooling offsets the radiant heating of fine particles because only thin boundary layers surround fine particles (meaning increased contact with cool air) compared to thick particles. Experiments are leading to models for predicting heating and ignition of particles of various sizes for different radiant fluxes.

Ignition Requirements for Dead and Live Fuels

Live fuels are not just wet dead fuels. This has been suspected for many years and is critical to understanding and modeling crown fires which burn primarily live material. However, the differences in how moisture is lost during heating and how ignition takes place in the presence of water have been poorly understood. New research is being conducted that identifies the critical mass loss-rates for live and dead fuels of different species, and the mechanisms of moisture loss in live fuels with radiant and convective heating. The chemistry of the live fuel is also explored for the carbohydrate contents and seasonal variations.



Photograph of flame wall apparatus in operation



Top picture: Dr. Mark Finney gives a demonstration of flame structure in the wind tunnel located at the Fire Sciences Laboratory in Missoula, MT.

Lower picture: Flame wall apparatus in operation.

Wildland Fire Management RDA

Science, research, and application support

The WFM RDA is a leader in research, development, and application. The NFDSC component of the RDA focuses on the following areas:

Developing, improving, and increasing production and operational use of decision support products

The WFM RDA supported 90 wildland fire incidents in FY 2011, including three Decision Support Centers. The staff rotates on call coordinators and analysts to provide interagency support 7 days a week. When fire activity rises, staffing increases with call-when-needed analysts and detailers. NFDSC analysts also seek to train local unit personnel with the tools and applications when possible. Staff coordinate monthly conference calls and yearly After Action Reviews (AAR) with the interagency geographic area editors. The intent is to aid information dissemination and to seek field and user input. When on assignment in geographic areas, staff provide support products and information to Multi-Agency Coordination (MAC) groups.

Providing practical mentoring and other means to strengthen decision support capacity

In 2011 a detailer program was initiated; allowing up and coming analysts to join the RDA for a short virtual stint. The detailer program was very successful, with five detailers receiving on-the-job training, mentoring, and continuing education.

Many staff participate as course chairs, coaches, instructors, and mentors in S495 Geospatial Fire Analysis, Interpretation, and Application, now taught biennially and S590 Advanced Fire Behavior Interpretation.

Support additional research as appropriate

WFM RDA works with many research units and organizations. For example, supporting and

coordinating with: the University of Alaska on an MS project to determine and evaluate variables contributing to the spread of fire in Alaska; the Pacific Northwest Research Station's Air Fire Program on smoke modeling and air quality monitoring; the Desert Research Institute (DRI) on a National Fire Danger Rating System (NFDRS) Pocket Card study.

Provide monitoring capability for large fire decision making and implementation

WFM RDA works with the Fire Fighting Performance Measures task group to aid in monitoring of large wildfires and risk informed decision-making. Throughout fire season staff continuously monitor WFDSS inputs (decision documentation, analysis, etc.) throughout the country and provide feedback as needed. When working in geographic areas, staff provide feedback to geographic area managers on gaps and deficiencies regarding decision and/or fire behavior analysis and seek to assist in providing needed services and skills.

Support refresher/currency training for non – NFDSC analysts

Many resources and programs are available to provide refresher and currency training. Staff participate as instructors in many regional and national workshops and courses. Staff provide webinars, Help content, and on the job training with detailers and call-when-needed analysts.

Support Values at Risk (VAR) and Values Inventory (VI) products

Staff worked with developers to compress the time and steps needed to produce Values at Risk and Values Inventory products to improve the access and use to the field.

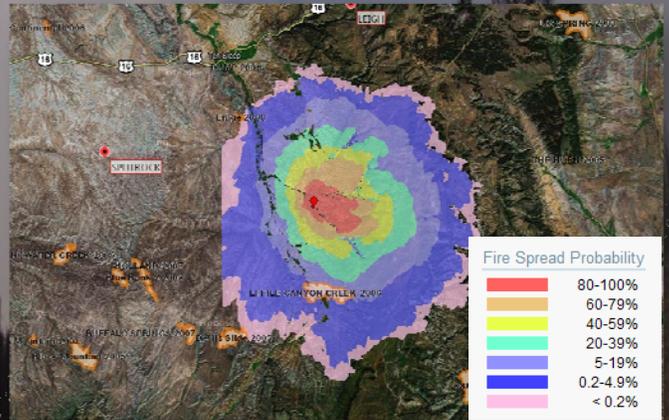
For a full report of the WFM RDA activities see the WFM RDA 2011 Annual Report, www.wfmrda.nwccg.gov

Background photo: Saddle Complex Fire, Salmon-Challis N.F. Idaho, photograph by Tonja Opperman;

Upper left photo: Marlena Hovorka, Rob Seli, and Lisa McDonald assisting the Wallow fire with decision support in WFSS, photograph by Mitch Burgard;

Lower left photo: Analyst Morgan Pence at Southern Area Decision Support Center, photograph by Kim Ernstrom;

Lower right: Fire Spread Probability (FSPro) map for the Otter Creek Fire, by Erin Noonan-Wright.



Appendix

● Fire Economics Research

Cooperative agreements/partnerships:

- University of Montana
- Oregon State University
- USDA Forest Service Western and Eastern Threat Assessment Centers
- Southern Research Station
- North Carolina State University

Publications:

- Calkin, D.E.; A.A. Ager; M.P. Thompson; M.A. Finney; D.C. Lee; T.M. Quigley; C.W. McHugh; K.L. Riley; J.M. Gilbertson-Day. 2011. A comparative risk assessment framework for wildland fire management: the 2010 Cohesive Strategy science report. RMRS-GTR-262, 64 p.
- Calkin, D.E.; M.A. Finney; A.A. Ager; M.P. Thompson; K.G. Gebert. 2011. Progress towards and barriers to implementation of a risk framework for Federal wildland fire policy and decision making in the United States. *Forest Policy and Economics*, 13(5): 378-389.
- Calkin, David E.; Jon D. Rieck; Kevin D. Hyde; Jeff D. Kaiden. 2011. Built structure identification in wildland fire decision support. *International Journal of Wildland Fire*, 20(1): 78-90.
- Calkin, D.E.; M.P. Thompson; M.A. Finney; K.D. Hyde. 2011. A real-time risk-assessment tool supporting wildland fire decision-making. *Journal of Forestry*, 109(5): 274-280.
- Donovan, Geoffrey H.; Jeffrey P. Prestemon; Krista Gebert. 2011. The effect of newspaper coverage and political pressure on wildfire suppression costs. *Society and Natural Resources*, 24(8): 785-798.
- Kaiden, Jeffrey D.; Jessica R. Haas; Kevin D. Hyde; Jeremy Reinicke. 2011. *RAVAR Analyst Manual v1.3*. K. Hyde, Editor. Missoula, MT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, 58 p.
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- Stettler, K.M.; Tyron J. Venn; David E. Calkin. 2010. The effects of wildfire and environmental amenities on property values in northwest Montana, USA. *Ecological Economics*, 69(11): 2233-2243.
- Stockmann, Keith; Kevin Hyde; Greg Jones; Dan Loeffler; Robin Silverstein. 2010. Integrating Fuel Treatment into Ecosystem Management Planning: A Proposed Project Planning Process. *International Journal of Wildland Fire*, 19:725-736.

- Thompson, M.P. and D.E. Calkin. 2011. Uncertainty and Risk in Wildland Fire Management: A Review. *Journal of Environmental Mgmt.*, 92(8): 1895-1909.
- Thompson, M.P.; D.E. Calkin; M.A. Finney; A. Ager; J.W. Gilbertson Day. 2011. Integrated National-Scale Assessment of Wildfire Risk to Human and Ecological Values. *Stochastic Environmental Research and Risk Assessment*, 25(6): 761-780.
- Thompson, Matthew P.; David E. Calkin; Julie W. Gilbertson-Day; A.A. Ager. 2010. Advancing Effects Analysis for Integrated, Large-Scale Wildfire Risk Assessment. *Environmental Monitoring and Assessment*. doi: 10.1007/s10661-010-1731-x.
- Venn, T.J. and D.E. Calkin. 2011. Accommodating non-market values in evaluation of wildfire management in the United States: challenges and opportunities. *International Journal of Wildland Fire*. 20(3): 327-339.

Presentations oral/poster:

- "Geospatial technologies in wildfire risk assessment". U. Montana, Information Technologies-Technology Support Services Luncheon. Missoula, MT. October 7, 2010.
- "A Comparative Wildfire Risk Assessment Framework for the Cohesive Strategy". International Association of Wildland Fire (IAWF) 3rd Annual Fire Behavior and Fuels Conference. Spokane, WA. October 25-29, 2010.
- "Incentivizing Wildfire Cost Containment via Assignment of Actuarially-Based Premiums". IAWF 3rd Annual Fire Behavior and Fuels Conference. Spokane, WA. October 25-29, 2010.
- "Spatially Defining Wildland Fire Risk: A novel approach to WUI mapping". IAWF 3rd Annual Fire Behavior and Fuels Conference. Spokane, WA. October 25-29, 2010.
- "Wildfire Suppression with Imperfect Information". Institute for Operations Research and the Management Sciences Annual Meeting. Austin, TX. November 8, 2010.
- "Incorporating Preference Uncertainty and Multi-Criteria Decision Analysis to Support Risk-Based Fuel Reduction Treatment Planning". 6th International Conference on Forest Fire Research. Coimbra, Portugal. November 15-18, 2010.
- "Progress Towards and Barriers to Implementation of a Risk Framework for US Wildfire Management". 6th International Conference on Forest Fire Research. Coimbra, Portugal. November 15-18, 2010.
- "Science Report for the Cohesive Strategy on Fire and Fuels Management". Cohesive Strategy Oversight Committee Meeting. Salt Lake City, UT. December 1, 2010.
- "Wildfire Risk: Modeling Wildfire Effects to Highly Valued Resources". Fire Program Analysis - Interagency Science Team Meeting. Boise, ID. January 6, 2011.
- "Wildfire Economics Research and the National Fire Decision Support Center". Fire Lab Lecture Series. Missoula, MT. January 20, 2011.
- "Multi-scale Spatial Wildfire Risk Assessment". Cohesive Strategy Prototype Demonstration Workshop. Asheville, NC. February 9, 2011.
- "Spatial Wildfire Risk Assessment at Multiple Scales". Cohesive Strategy Prototype Group. Asheville, NC. February 10, 2011.
- "Developing a National Tradeoff Model from Regional Wildfire Risk Assessments: Progress towards a Cohesive Strategy for Fire and Fuels Management in the United States". Symposium for Systems Analysis in Forest Resources. Marbella, Chile. March, 2011.
- "Partial Observability and Learning in Forest Management: Emerging and Potential Applications". Symposium for Systems Analysis in Forest Resources. Marbella, Chile. March, 2011.

- "Wildland Fire Outcome Analysis – Firefighter Exposure and Suppression Effectiveness". Poster Presentation at the 11th International Wildland Fire Safety Summit. Missoula, MT. April 4-8, 2011.
- "Large Air Tanker Use Trends and Implications for Safety". International Association of Wildland Fire Safety Summit. Missoula, MT. April 4-8, 2011.
- "Extending FSPRO for Fire Effects Prediction". Fire Lab Lecture Series. Missoula, MT. June 2, 2011.
- "Predicting Fire Effects for Real-Time Decision Support". ESRI International User Conference. San Diego, CA. July 11-15, 2011.
- "ICWater Fire Chemicals Source Term Model – Intro & Overview". Fire Chemicals Team Meeting, MTDC. Missoula, MT. August 3, 2011.
- "Assessing the ability of downscaled GCMs to capture the variability need in wildland fire simulation modeling". National Centres of Competence in Research, Swiss Climate Research Summer School. Grindelwald, Switzerland. September 4-9, 2011.

Projects:

- Described in full in the Fire Economics section of this report.

Workshops/conference attendance:

- University of Montana, Information Technologies - Technology Support Services Luncheon. Missoula, MT. October 7, 2010.
- International Association of Wildland Fire 3rd Annual Fire Behavior and Fuels Conference. Spokane, WA. October 25-29, 2010.
- Institute for Operations Research and the Management Sciences Annual Meeting. Austin, TX. November 8, 2010.
- 6th International Conference on Forest Fire Research. Coimbra, Portugal. November 15-18, 2010.
- Cohesive Strategy Oversight Committee Meeting. Salt Lake City, UT. December 1, 2010.
- Fire Program Analysis - Interagency Science Team Meeting. Boise, ID. January 6, 2011.
- Cohesive Strategy Prototype Demonstration Workshop. Asheville, NC. February 9-10, 2011.
- Symposium for Systems Analysis in Forest Resources. Marbella, Chile. March, 2011.
- 11th International Wildland Fire Safety Summit. Missoula, MT. April 4-8, 2011.
- ESRI International User Conference. San Diego, CA. July 11-15, 2011.
- Fire Chemicals Team Meeting, MTDC. Missoula, MT. August 3, 2011.
- National Centres of Competence in Research, Swiss Climate Research Summer School. Grindelwald, Switzerland. September 4-9, 2011.

Training:

- "RAVAR Training for NFDSC Analysts". Boise, ID. September 30 – October 1, 2010.
- "Science Report for the Cohesive Strategy on Fire and Fuels Management". Cohesive Strategy Oversight Committee Meeting. Salt Lake City, UT. December 1, 2010.
- "Wildfire Risk: Modeling Wildfire Effects to Highly Valued Resources". Fire Program Analysis - Interagency Science Team Meeting. Boise, ID. January 6, 2011.
- Presented "Values at Risk Analysis" to S-482 Advanced Fire Management Applications Class. Northern Rockies Training Center Missoula, MT February 7-11, 2011.
- "RAVAR Virtual Training for NRDSC Analysts". Webinar. April 28, 2010; May 3, 2011; May 19, 2011.
- "RAVAR Demonstration". Webinar. May 9, 2011.
- "Map-making in RAVAR". Webinar. June 7, 2011; June 14, 2011.

- “Creating the RAVAR Report Document”. Webinar. June 8, 2011; June 15, 2011.

Organizational representation:

- Cohesive Strategy Phase I Science Committee
- Cohesive Strategy Phase II Sub-Team Lead on Fire and Fuels Management
- Four-Mile Canyon Fire Review Team
- FPA Interagency Science Team
- Wildland Fire Performance Measures Science Team
- Large Airtanker Contract Review Team

2012 Planned activities:

The team will expand analyses and analytic tools for spatial wildfire risk assessment. Specific planned activities include:

- 1) Continued support for Phase III of the Cohesive Strategy.
- 2) Continued field-level engagement to support application and implementation of spatial wildfire risk assessment and mitigation planning, including an interagency risk assessment involving the Bridger-Teton National Forest and the Grand Teton National Park, and prioritization of fuel treatment investments across USFS Region 2.
- 3) Expanding tools and methods to estimate spatiotemporal dynamics of wildfire risk due to natural disturbance, management, climate change, and human development.
- 4) Using the Large Fire Simulator, FSIM, to investigate changes in modeled future burn probabilities, flame lengths, and fire intensities due to changes in climate. This includes the use of a scenario sensitivity analysis incorporating both simple changes in means and variability of fire weather parameters, as well as incorporation of downscaled global circulation modeled weather for a more comprehensive investigation of potential changes in future fire behavior due to changes in climate.
- 5) Expanding use of systematic frameworks to elicit expert judgment for characterizing social and ecological effects of wildfire, and incorporating this information into risk assessments
- 6) Expanding use of multi-criteria decision analysis and resource economics to facilitate integrated assessment and prioritization across non-market values at risk.
- 7) Engage with FPA to expand consideration of highly valued resources and refine management costs within the FPA system.
- 8) Employ stochastic fire simulation modeling and geospatial analysis to evaluate the effectiveness of implemented fuel treatments in terms of reducing likelihood of resource damage and loss.
- 9) Assist in the re-build of the FPA Initial Response Simulator (IRS) for research and explore opportunities to use IRS and other fire behavior models to estimate potential fire outcomes under alternative investments, including using IRS to model large air tanker effectiveness.
- 10) Develop, implement, and deliver an automated, geospatial tool to quantify wildfire risk and prioritize areas for mitigation by integrating FPA large fire output with spatial resource layers, resource response functions, and resource priorities.

The team will conduct research to identify factors that influence suppression resource effectiveness in bringing fires to containment. This will include publishing econometric models of suppression resource productive efficiency using standard reporting data as well as expansion of these models to new spatially explicit fire perimeter data. Results from this research can indicate conditions associated with highly cost-effective suppression efforts and can be used to model potential fire outcomes under alternative allocations of suppression resources.

The team will continue its work modeling relationships between fire costs and geographic features associated with final wildfire perimeters. This includes identifying factors that influence the likelihood that an ignition will result in an escaped large fire, and the likelihood that management costs will exceed certain thresholds, based on ignition characteristics. This research can help illustrate potential tradeoffs between the costs of investing in additional initial attack resources and the costs of suppressing escaped large fires. Further, these models can inform the allocation of scarce resources throughout the fire season and over multiple contemporaneous fire events to cost-effectively minimize damage from wildfires.

Human Factors & Risk Management RDA

Cooperative agreements/partnerships:

- New shared services agreement with USFS Organization Development Enterprise Team to provide ODE with social science expertise.
- Continued partnership with Oregon State University to develop and test utility of concepts of ‘mindfulness’ in fire-line safety.
- Continued partnership with UC Santa Barbara to develop theory regarding how members of fire crews gain an understanding of what is a ‘hazard’, a ‘risk’ and learn appropriate responses. This partnership is also developing a richer understanding of how group culture works to develop and access individual expertise.
- New partnership with Valparaiso University to consider organizational response to error from the perspective of rhetoric, story and communications. Findings have direct implications for USFS Safety Journey and organizational learning.
- New partnership with the University of Montana to publish results of a study investigating and creating a benchmark for ‘high reliability’ practices in the federal wildland fire community.

Publications:

- Lewis, A.; Hall, T.E.; Black, A. 2011. Career stages in wildland firefighting: implications for voice in risky situations *Int. J. Wildland Fire*. 20:115-124.
- Gebert, K; Black, A. 2011. Effect of suppression strategies on federal Wildland fire expenditures. *Journal of Forestry*.
- Black, A.E.; Landres, P. 2011. Understanding the effects of fire management practices on forest health: implications for weeds and vegetation structure. Ch 14, p151-156 *in* Forest Health Monitoring 2009 National Technical Report. K.M. Potter and B.L. Conking (eds).Draft posted online.
- Black, A.; Thomas, D.; and Saveland, J. 2011. Learning from Escaped prescribed fire reviews [abstract]. *In* Robinson, M.; Ziegler, J.; Alexander, M.E.; Bushey, C.L.; Ekstrom, M., comps. Program and Abstracts of the 11th International Wildland Fire Safety Summit; 4-8 April 2011; Missoula, MT. Missoula, MT: International Association of Wildland Fire. p56-57.
- Black, A.; Thomas, D.; and Saveland, J. 2011. Dialogue on Safety [abstract]. *In* Robinson, M.; Ziegler, J.; Alexander, M.E.; Bushey, C.L.; Ekstrom, M., comps. Program and Abstracts of the 11th International Wildland Fire Safety Summit; 4-8 April 2011; Missoula, MT. Missoula, MT: International Association of Wildland Fire. p46-47.
- Black, A.; Thomas, D.; Saveland, J.; Ziegler, J.D. 2011. Learning from Escaped prescribed fire reviews. *In* Robinson, M.; Ziegler, J.; Alexander, M.E.; Bushey, C.L.; Ekstrom, M., comps. Program

and Abstracts of the 11th International Wildland Fire Safety Summit; 4-8 April 2011; Missoula, MT. Missoula, MT: International Association of Wildland Fire. 3p.

- Black, A.E.; Able, J.; Barrett, C.; Riley, J.; Sova, S. May 8, 2011. Incident Management Organization Succession Planning Stakeholder Feedback, Initial Summary Statistics. Compiled by ODE for IMOSP Working Team Meeting, May 8-11, Boise, ID. 400p.
- Black, A.E.; Able, J.; Barrett, C.; Riley, J.; Sova, S. June 26, 2011. Incident Management Organization Succession Planning Stakeholder Feedback, Final Summary Statistics. Compiled by ODE for IMOSP Working Team Meeting June 26-28, Boise, ID. 400p.
- Black, A.E.; Husari, S.; Able, J. Sept 16, 2011. Incident Management Organization Succession Planning Stakeholder Feedback, Data Summary. Compiled for NWCG Executive Board Meeting, September 22, Boise, ID. 36p.
- Black, A.E.; Husari, S.; Able, J. Sept 16, 2011. Incident Management Organization Succession Planning Stakeholder Feedback, Data Summary Appendices. Compiled for NWCG Executive Board Meeting, September 22, Boise, ID. 45p.
- Black, A.E.; Ziegler, J.; Thomas, D. 2011. "Learning from escaped prescribed fire reviews: workshop flip chart summary. White paper posted to Joint Fire Science Program's project website. 9p.
- Black, A.E.; Ziegler, J.; Thomas, D. 2011. "Learning from escaped prescribed fire reviews: workshop discussion summary. White paper posted to Joint Fire Science Program's project website. 11p.
- Black, A.E.; Thomas, D.; Saveland, J. 2011. "Learning from escaped prescribed fire reviews – A Joint Fire Science Project – Initial Findings. White paper posted to Joint Fire Science Program's project website. 2p.

Presentations oral/poster:

- Black, A.; Thomas, D.; Saveland, J.; Ziegler, J.D. 2011. Learning from Escaped prescribed fire reviews. 11th International Wildland Fire Safety Summit; 4-8 April 2011; Missoula, MT. Missoula, MT.
- Black, A.E. August 16, 2011. NWCG IMT Succession Planning: Progress Report. Delivered to the NWCG's Executive Board at their August 16, 2011 Meeting, Boise, ID.
- Black, A.E. 2011. 5/10-12, 2011. Summary analysis of stakeholder feedback data collected for the NWCG's Incident Management Organization Succession Planning Team.
- Black, A.E. 2011. 6/16, 2011. Update to stakeholder feedback data collected for the NWCG's Incident Management Organization Succession Planning Team.
- Black, A.E. June 26, 2011. Incident Management Organization Succession Planning Stakeholder Feedback, Final Summary Statistics. Final presentation of stakeholder feedback data collected for the NWCG's Incident Management Organization Succession Planning Team. Delivered on-line/via conference call due to travel restrictions.
- Black, A.E. May, 2011. Invited to briefing Forest Service Region 8 Fire Staff and Southern Fire Chiefs during their May conference call regarding JFSP project 'Learning from Escaped Prescribed Fire Reviews'.
- Black, A.E. July 20, 2011. Invited briefing of Forest Service's National Fuels Group on their July conference call regarding JFSP project 'Learning from Escaped Prescribed Fire Reviews'

Projects:

- Learning from Escaped Prescribed Fire Reviews (Black)
- High Reliability practices in federal wildland fire management (Black)

- Developing holistic performance measures for wildland fire incidents.
- Unpacking the risk assessment process in firefighting crews (Jahn – UCSB)
- Utility of Mindfulness in wildland fire-fighting (Lewis – OSU)

Workshops/conference attendance:

- 11th International Wildland Fire Safety Summit, Missoula, MT 4/4-7/11. Presentation: Learning from Escaped Prescribed Fire Reviews. Black, Thomas, Saveland, Ziegler. 4/7/11
- Jahn, J. L. S. (November 2010). Social Bodies: Bringing Materiality into Theorizing about High Reliability Organizations. Paper presented to the Organizational Communication Division of the National Communication Association, San Francisco, CA.
- Jahn, J. L. S. (April 2011). Learning by Doing: Wildland Firefighters' Stories about their Pivotal Fireline Learning Experiences. Paper presented to the International Association of Wildland Fire, Missoula, MT.
- Five two-day workshops with Interagency prescribed fire community members held between January and July, 2011. Workshops held in: Portland, OR; Denver, CO; Salt Lake City, UT; Tuscon, AZ; Tallahassee, FL.

Training:

- Black, A.E. 1/12/2011. Developed and led 4 hour short course on 'Change Blindness' for the RT-300 Prescribed fire Workshop, USFS Region 3.
- Lewis, A. 2011. Safety in Fire: leadership and employee voice. Presentation to the L480 course based on work conducted under an RJVA with HFRM. 3/8/2011.

Organizational representation:

- RMRS Safety Practitioner's Team
- Organization Development Enterprise Team – Social Science Analyst for NWCG's Incident Management Organization Succession Planning Team.

Fire Spread Research

Cooperative agreements/partnerships:

- Challenge-cost-share agreement with Professor David Lignell (Brigham Young University) for investigating the use of One Dimensional Turbulence for modeling turbulent flame structure
- Cooperative funding with Joint Fire Sciences of live fuel ignition (W, Matt Jolly, PI).

Publications:

- Ager, A.A, M.A. Finney, A. McMahan, and J. Cathcart. 2010. Measuring the effect of fuel treatments on forest carbon using landscape risk analysis. Nat. Hazards Earth Systems Science 10:2525-2562
- Finney, M.A., C.W. McHugh, I.C. Grenfell, K.L. Riley, K.C. Short. 2011. A Simulation of Probabilistic Wildfire Risk Components for the Continental United States. Stochastic environmental research and risk assessment. 25(7): 973-1000
- Finney, M.A., I.C. Grenfell, C.W. McHugh, R.C. Seli, D. Trethewey, R.D. Stratton, and S. Brittain. 2011. An ensemble method for wildland fire simulation. Environmental Modeling and Assessment. 16(2):153–167.
- McAllister, S.S., W.M. Jolly, M.A. Finney, J.D. Cohen, A.M. Hadlow, and I.C. Grenfell. 2011. Piloted ignition of live forest fuels. Intl. Assoc. Fire Safety Science, Accepted.

- Finney, M.A. and S.S. McAllister. 2011. A review of fire interactions and mass fires. *Journal of Combustion*. Article ID 548328, 14 pages doi:10.1155/2011/548328
- Noonan-Wright, E.K. T.S. Opperman, M.A. Finney, G.T. Zimmerman, R.C. Seli, L.M. Elenz, and D.E. Calkin. 2011. Developing the U.S. Wildland Fire Decision Support System (WFDSS). *J. Combustion*.
- Jason M. Forthofer and Scott L. Goodrick, "Review of Vortices in Wildland Fire," *Journal of Combustion*, vol. 2011, Article ID 984363, 14 pages, 2011. doi:10.1155/2011/984363
- Forthofer, J.; Butler, Bret 2010. Large scale fire whirls: Can their formation be predicted?. In: Wade, Dale D.; Robinson, Mikel L., eds. *Proceedings of 3rd Fire Behavior and Fuels Conference; 25-29 October 2010; Spokane, WA*. Birmingham, AL: International Association of Wildland Fire. 7 p.
- Forthofer, J.; Shannon, K. 2011. WindNinja Tutorial 3: Point Initialization. White paper distributed with the WindNinja Software.
- Forthofer, J.; Shannon, K. 2011. WindNinja Tutorial 4: Weather Model Initialization. White paper distributed with the WindNinja Software.
- Vogelmann, J. E., J. R. Kost, B. Tolk, S. Howard, K. Short, X. Chen, C. Huang, K. Pabst, and M. G. Rollins. 2011. Monitoring landscape change for LANDFIRE using multi-temporal satellite imagery and ancillary data. *IEEE*
- Thompson, M. P., D. E. Calkin, J. Herynk, C. W. McHugh, and K. C. Short. In Review. Large airtanker and wildfire management in the US Forest Service: examining data availability and exploring usage and cost trends. *International Journal of Wildland Fire*.
- *Journal of Selected Topics in Applied Earth Observations and Remote Sensing* 4:252-264.
- NWCG Fire Reporting Subcommittee Task Team. 2011. NWCG Fire Occurrence Data and the Cohesive Strategy. Briefing Paper, 1 June 2011.

Presentations oral/poster:

- Karin Riley, Mark Finney, Alan Ager, Andrew McMahan. *Effect of Fuel Treatments on Terrestrial Carbon Storage and Emissions, Given Wildfire Risk*. 14th symposium for Systems Analysis in Forest Resources, Maintencillo Chile, March 8-11, 2011
- Alan Ager, Nicole M. Vaillant, Mark A. Finney. *A General Framework for Fuel Treatment Optimization*, 14th symposium for Systems Analysis in Forest Resources, Maintencillo Chile, March 8-11, 2011
- Mark Finney, Karen Short, Danny C. Lee, Brent Timothy, Krista Gebert. A Simulation and Statistical Modeling Approach to Including Large Fires in a Wildland Fire Planning System. 14th symposium for Systems Analysis in Forest Resources, Maintencillo Chile, March 8-11, 2011
- Mark A. Finney. *A Simulation System for Estimating Wildfire Risk for the Continental U.S.* 8th IALE World Congress: Session on Controls and Effects of Ecosystem Disturbances at Landscape Scale
- Forthofer, J. Presentation about fire whirls and wind modeling at the Northern Rockies Fire Behavior Workshop in Missoula, MT.
- Forthofer, J. Presented a short course on running WindNinja. The 11th International Wildland Fire Safety Summit in Missoula, MT. April 4-8, 2011.
- McHugh, Charles, M. Finney, and L. Bradshaw. "An assessment of climate and fire danger rating in the Northern Rockies during the 1910 fire season." Oral presentation. Third Fire Behavior and Fuels Conference, Spokane, WA. October 25-29, 2010.

- Heinsch, F. A. and C. McHugh, Charles. "Climate change and fire danger rating in the northern Rockies." Poster presentation. Third Fire Behavior and Fuels Conference, Spokane, WA. October 25-29, 2010
- Short, K. C., and A. K. Berriochoa. "Developing a National Fire-Occurrence Database for the Fire Program Analysis System." Presented at the USDA Forest Service National Fire Planners' Meeting, Sacramento, California, 7 April 2011.

Projects:

- Flame Structure - Artificial fuel sources are constructed to study the combustion interface inside a fuel bed.
- Particle Heating in Spreading Fires - Experiments are leading to models for predicting heating and ignition of particles of various sizes for different radiant fluxes.
- Ignition Requirements for Dead and Live Fuels - identifies the critical mass loss-rates for live and dead fuels of different species, and the mechanisms of moisture loss in live fuels with radiant and convective heating.
- Cohesive Strategy and Wildfire Risk Assessment - Research Forester Mark Finney and several members of the NFDSC were members of the Cohesive Strategy Science Team (C.W. McHugh, K. Short, K. Riley). The team helped develop the risk-based framework and national data used to quantitatively compare risks among alternative national management strategies including the historical, current, and increased fuel treatments. Advances in simulation-based fire risk assessment methods are being developed jointly with researchers in the NFDSC Economics team and PNW-WWETAC.
- Incentives - Research into the use of simulation-based risk assessment has led to new research on applying standard actuarial risk-management methods to wildland fires, including insurance and incentives. This work involves the Fire Spread team and Economics teams at the NFDSC.
- Risk Based accounting of Carbon and Emissions - Along with partners from PNW-WWETAC and Oregon State University, the risk framework and simulation methods are being applied to estimate carbon and emission for the CONUS. These methods offer the chance to estimate carbon and emission consequences in the context of uncertainty and variability in wildfire occurrence and behavior.

Workshop/conference attendance:

- 7th US National Technical Meeting of the Combustion Institute, Atlanta, GA, March 20-23, 2011.
- 8th International Association of Landscape Ecology, Beijing China
- 14th symposium for Systems Analysis in Forest Resources, Maintencillo Chile, March 8-11, 2011
- Fire Program Analysis Stakeholders' Year 2 After-Action Review: Workshop of the Focus Group on Action Items and Assignments. Boise, Idaho, 28-30 September 2010.

Training:

- S495 (Geospatial Fire Analysis and Interpretation and Application) at NAFRI in Tucson, AZ.
- FPA – IRS training
- Webinars on the use and interpretation of FSPro as part of the distance learning portion of the S495 Class (C. Mchugh), 4/05-06/2011
- Webinar: Introduction to the FPA FSim Share Center, presented to Fire Planning Unit representatives and other Fire Program Analysis stakeholders on 29 June 2011. Available online at <http://www.myfirecommunity.net/Neighborhood.aspx?ID=923>

Organizational Representation:

- Cohesive Strategy (Fire Suppression)

● Wildland Fire Management RDA

Cooperative agreements/partnerships:

- Collaborative efforts with the Airfire Program, Pacific Northwest Research Station.
- Cooperative work with the LANDFIRE Program to validate fuel models for annual updates into WFSS.
- Cooperative agreement and development of Board of Directors for oversight of DOI Fire Application Specialists and their participation in the WFM RDA and NFDSC.
- Continued partnerships with Desert Research Institute (DRI)

Publications:

- Kurth, Laurie. 2011. S495 Geospatial Fire Analysis, Interpretation, and Application. RMRS Explorer Newsletter. April 26, 2011.
- Elenz, Lisa, and Thomas Zimmerman. RMRS Programs Continue to Provide Support to Fire. RMRS Explorer Newsletter. June, 2011.
- Pence, Morgan and Thomas Zimmerman. (2011). The Wildland Fire Decision Support System: Integrating science, technology, and fire management. *Fire Management Today*. **71** (1), p. 22-26.
- Noonan-Wright, Erin, T.S. Opperman, M. A. Finney, G.T. Zimmerman, R.C. Seli, L.M. Elenz, D. E. Calkin, and J.R. Fiedler. 2011. Developing the U.S. wildland fire decision support system (WFSS). *J. Combustion Vol. 2011, Article ID 168473*. 14 p
- Review of FSPro Analysis, white paper, June 2011.
- Zimmerman, Thomas, L. Kurth, and M. Burgard. 2011. The Howling Prescribed Natural Fire – long-term effects on the modernization of planning and implementation of wildland fire management. Proceedings of 3rd Fire Behavior and Fuels Conference, October 25-29, 2010, Spokane, Washington, USA. International Association of Wildland Fire, Birmingham, Alabama, USA.
- Zimmerman, Thomas. 2011. Fire Science Application and Integration in Support of Decision Making. Proceedings, Wildfire 2011, The 5th International Wildland Fire Conference, Living with Fire: Addressing Global Change through Integrated Fire Management. Proceedings. Sun City, South Africa.
- Zimmerman, Thomas, L. Elenz, M. Hovorka. and D. Rau. *In Press*. Pairing risk assessment, risk management, and decision making to improve wildland fire management. Proceedings 1st International Conference on Safety and Crisis Management in the Construction, Tourism and SMEs Sectors. June 2011. European University, Nicosia, Cyprus.
- Zimmerman, Thomas. *In Press*. Wildland Fire Management Decision Making. *Journal of Science and Agricultural Technology*. . Vol. 2(2B). Feb. 2012.

Presentations oral/poster:

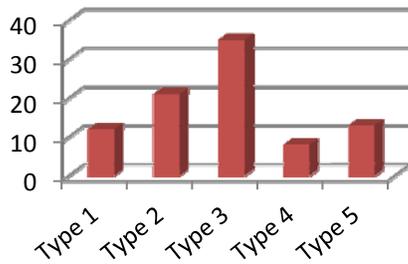
- WFSS Development, 6th International Forest Fire Research Conference, Coimbra, Portugal Nov. 2010

- WFDSS Fire Behavior Tools Presentation at Southwest Interagency Fuels Workshop, Flagstaff, AZ
- WFDSS Poster Presentation at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- NFDSC Poster & Presentation at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- Evaluating effectiveness of partial fuel treatments at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- The Chakina Fire, the Spotting Problem at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- Coupling Fire Behavior Models with Other Decision Support Tools at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- Season Ending Events, A Matter of Perspective at the International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA, Oct. 2010
- Weather in Fire Behavior Modeling, National Weather Service Meeting, Oct. 2011.
- NFDSC and WFDSS at the National Predictive Services Meeting, California Nov. 2010 and Idaho Feb. 2011
- Overview of WFDSS, NIFC, Boise, ID, June 2011.
- Organizational Needs Assessment within WFDSS, virtual presentation to Payette N. F. May, 2011
- WFDSS for Data Managers, 1) Southwest BIA Fire Planning Workshop and 2) Coeur d'Alene Tribe March and April, 2011
- WFDSS Support, National Multi-agency Coordination Meeting, Boise, ID, Dec. 2010
- WFDSS, Interagency Fire Planning Committee, Webinar, spring 2011
- WFDSS and Fire Behavior Overview, Northern Rockies Fire Behavior Workshop, Missoula, MT, May 2011.
- WFDSS and WFM RDA presentation for visiting Greek Fire Managers, May 2011.
- Fire Behavior Expert Panelist, Air Tanker EIS Science Panel, July, 2011 Boise.
- Overview of Use of WFDSS Shapes and Spatial FMPs in WFDSS, Interagency Fuels Planning Committee and Data Managers, May 2011
- Fire Policy & WFDSS, Colorado State University Graduate Program, Webinar.
- Monthly GA Editor Call Coordination and presentations, Webinar.

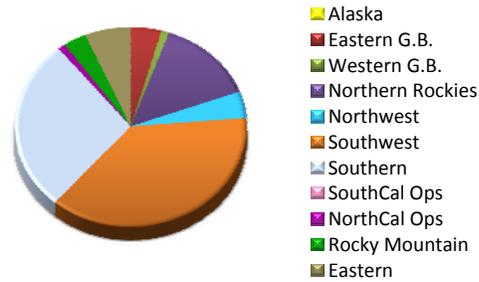
Projects:

- Incident/Decision Support: WFM RDA NFDSC staff supported 90 incidents and 3 Decision Support Centers. Graphs below display the following: support by incident type, support by geographic area, support products and tools provided, support provided by agency, and a breakdown of on-scene vs. remote support with primary support vs. assisted support. Primary support indicates the NFDSC analyst was the main analyst providing support to the incident. Assisted support means the NFDSC analyst was either working for a primary analyst or training another analyst. Assisted support gives local units the opportunity to work with and learn from NFDSC analysts. Although this is desired, local unit personnel and other trainees are not always available to participate.

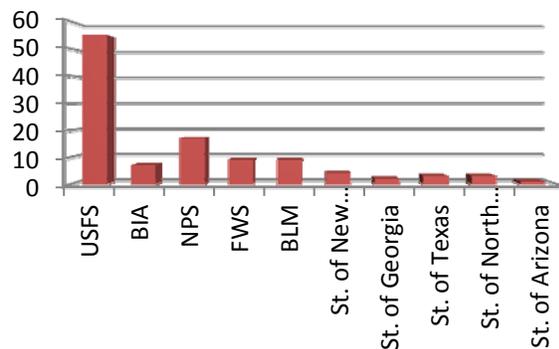
FY 2011 Support by Incident Type



FY 2011 Support by Geographic Area

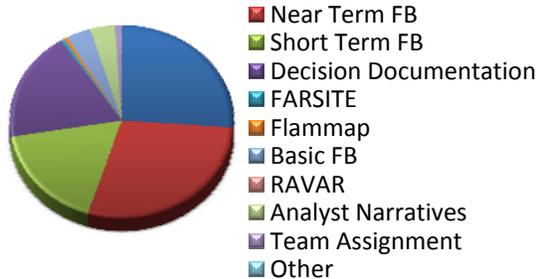


Agency Distribution Support in FY2011

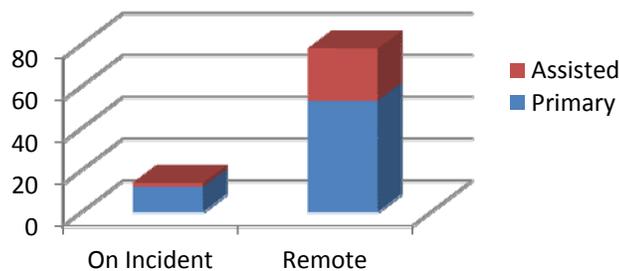


Support Products/Tools Provided in

FY2011



On-scene/Remote Support & Primary Support/Assisting



- WFM RDA's NFDSC website improvement and maintenance. www.wfmrda.nwcg.gov/nfdsc.php
- Training Support / Technical Transfer: Provided support to national and regional training courses pertaining to fire behavior and risk assessment tools. Utilized short detail opportunities to provide training in using modeling tools and exposure of the NFDSC operations and functions for 5 individuals.
- Operational Documentation: Interagency standards for fire and fire aviation operations. Updated fire management planning guidance within the "Red Book" to reflect the role of the NFDSC and wildland fire decision support tools and to update language as it pertains to WFDSS and various guidance documents.
- Supporting research as appropriate. Coordinated and supported an MS course of study with the University of Alaska on determining and evaluating variables contributing to the spread of fire in Alaska.

Workshops/conference attendance:

- Geographic Editor After Action Review, Portland OR
- National Predictive Services Meeting, Pasadena, CA
- Southwest Interagency Fuels Workshop, Flagstaff, AZ
- International Association of Wildland Fire, Fire Behavior and Fuels Conference, Spokane, WA
- Northern Rockies Fire Behavior Workshop, Missoula, MT
- 6th International Forest Fire Research Conference, Coimbra, Portugal. Nov. 2010.
- Professional Technical Writing, Boise ID

Training:

- S495 Geospatial Fire Analysis Interpretation and Applications- Course coordinators, cadre, instructors, mentors, and coaches, Tucson, AZ
- Northern Rockies Fire Behavior Workshop, Missoula, MT
- Rx510 Advanced Fire Effect- Course cadre and instructors, Tucson, AZ
- 5 Webinar training courses on Basic/Unassisted, Short Term, and Near Term Fire Behavior tools, FSPRO, and Values at Risk
- FOR 422 WFDSS Training, Sequoia Kings Canyon National Park
- Technical Fire Management (TFM)- Introduction to WFDSS, Bothell, WA
- Alaska LANDFIRE virtual webinar training on observations on use of LANDFIRE data in fire behavior analysis for Alaska
- Fire Management Leadership Northern Region- WFDSS Overview
- Southern Area fall fire season WFDSS refresher webinar refresher training (twice)
- NPS SE Region WFDSS review webinar training
- WFDSS review, NPS/FWS Refresher
- S430, WFDSS Near Term Fire Behavior support and curriculum.
- S482, provided WFDSS FSPRO support and curriculum
- WFDSS Overview training, in person and webinar, NIFC employees (twice)
- Fire Program Management Course – Presentation on WFDSS use and decision making, Boise ID, March 2011.

Organizational representation:

- NWCG Fire Behavior Subcommittee Chair
- NWCG Fire Planning Subcommittee Representative
- NWCG Fire Reporting/209 Subcommittee Representative
- Landscape Fire and Resource Management Planning Tool (LANDFIRE) project Liaison
- NWCG Fire Danger Subcommittee
- Predictive Services/Intelligence liaison
- Airtanker EIS Science Panel WFM RDA Organizational Rep.
- RMRS Science Application and Integration (SAI) WFM RDA Organizational Representative
- Fire Research And Management Exchange System (FRAMES) Liaison
- Air/Fire Group Liaison
- Disaster Assistance Support Program Representative
- S495 Geospatial Fire Analysis, Interpretation, and Application Steering Committee Chairmen, cadre, mentors, and coaches.
- S590 Advanced Fire Behavior Interpretation – Steering Committee Co-Chair, cadre, mentor, coaches.

- Rx510, Advanced Fire Effects Steering Committee member
- Geospatial Equipment and Technology Applications (GETA) liaison
- National Incident Management Organizations (NIMO) liaison
- National Performance Measures Task Group member(s)
- Interagency IT Roadmap Project liaison
- USFS Mobile Technologies Integration for Fire & Aviation Management – team member
- Fuels Transition Research Representative
- Northern Rockies Consortium Liaison
- NWCG Forest Service Executive Board Representative
- Cohesive Strategy Team Member
- Interagency Fuels Treatment Decision Support System (IFTDSS) Liaison
- NWCG Geospatial Task Group Representative
- FS/Interagency Geo database Data Standards Project Representative
- Research Representative to NWCG
- Wildland Fire Science Partnership member

2012 Planned activities:

- In 2012 the 5 focus areas of work for the RDA are: 1) Coordinate relevant and timely fire science application, 2) Develop and support a Wildland Fire Decision Support System (WFDSS), 3) Coordinate technology and development efforts for hazardous fuels and vegetation management and support interagency training in this area, 4) Develop applications, disseminate information, conduct training for existing and emergent research priorities, 5) Participate in and manage the National Fire Decision Support Center (NFDSC). See the Wildland Fire Management Research Development and Application 2011 Annual Report www.wfmrda.nwcg.gov for 2012 planned activities.

