



Wildland Fire Management Research Development and Application (WFM RD&A)

Fiscal Year 2012 Report



*Integrating
science, technology
and fire management.*

Wildland Fire Management RD&A

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VISION

The Wildland Fire Management RD&A is a highly effective organization providing exemplary fire science integration and wildland fire management support to management agencies and personnel through proactive and timely response in collaboration with partners.

MISSION

The Wildland Fire Management RD&A Program will sponsor and guide the development and application of wildland scientific knowledge; develop decision support tools and hazardous fuels planning applications; and provide science application services to the interagency wildland fire community.

The Wildland Fire Management RD&A Program will manage the National Fire Decision Support Center and serve as a primary point of contact for communication between scientists and participating field managers, and as an advisor to program administrators at local, regional, and national levels.

With integrity, professionalism, safety, and mutual respect as our core values, we serve as leaders, role models, and mentors within our resource management agencies.

Message from the Program Manager



As the new Program Manager of the Wildland Fire Management Research, Development and Application program (WFM RD&A), I ask that you spend a few minutes reviewing the challenges, innovations, expansion, and accomplishments we experienced in 2012.

The Wildland Fire Decision Support System and the WFM RD&A assistance to the field in using it was challenged by the most severe fire season since the application became available. Despite extreme peaks in large fire activity, the application performed well and the WFM RD&A staff met all support requests in a timely manner. WFDSS continues to evolve with additional tools being added to help decision-makers assess impacts on firefighter safety (exposure to hazards) and overall efficiency associated with strategic alternatives for managing a wildfire.

While development and management of WFDSS has been a large part of the WFM RD&A workload, we are expanding into new areas of Technology Transfer and Decision Support. We are working with Homeland Security and White House staff to share data and applications for use in planning and response to non-wildfire disasters. We have developed online training and applications for planning and implementing prescribed fires, and expect this portion of our program to continue to expand to meet demands for improvements in prescribed fire risk management and documentation of decisions. The WFM RD&A provided leadership in testing mobile technologies for use in collaborative decision-making and enhanced situational awareness for tactical decision on the fireline. Mobile devices are demonstrating great utility in making better informed decisions and in providing an increasingly accurate “common operating picture” of incidents for all organizational levels.

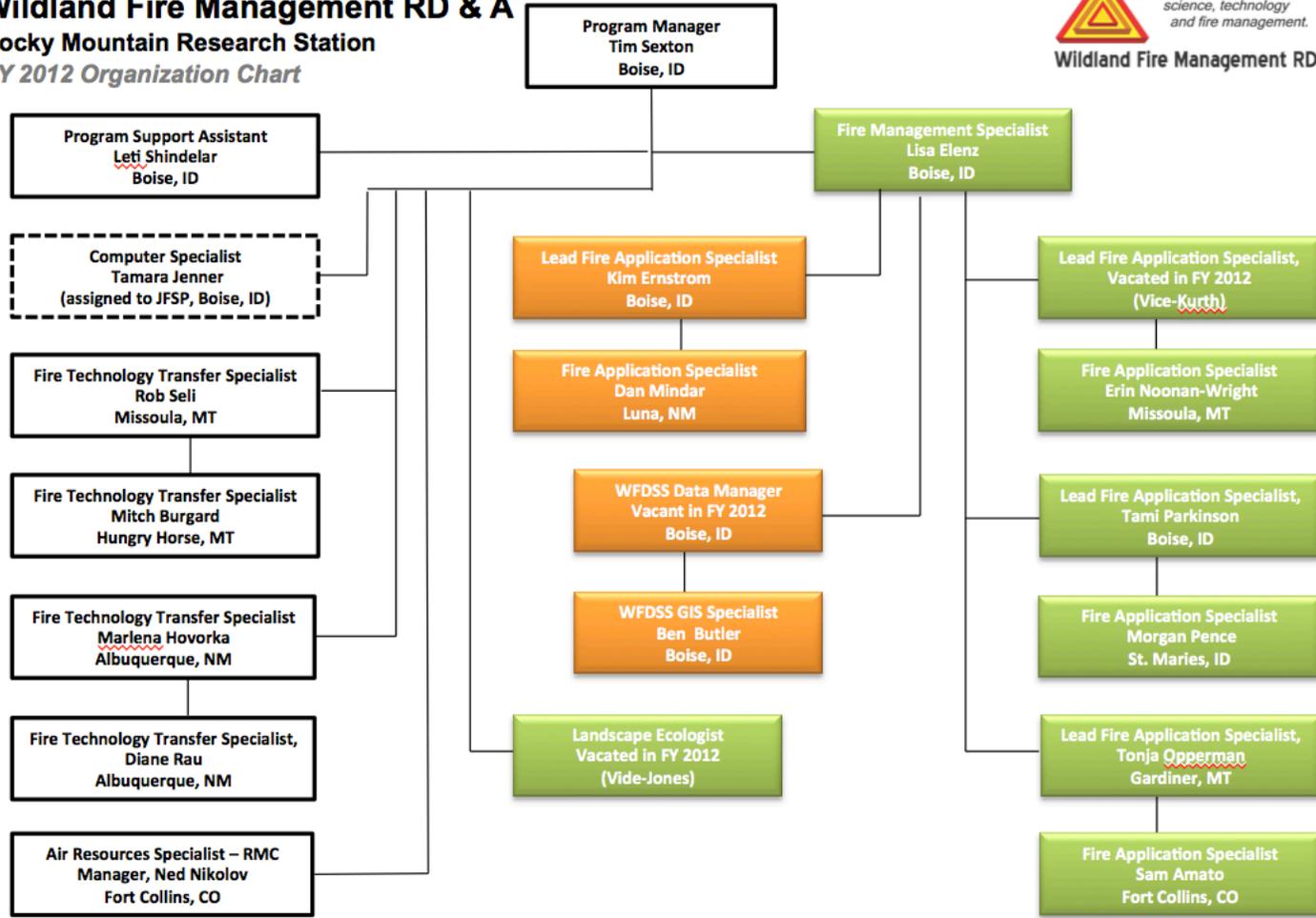
The high level of accomplishment of the WFM RD&A staff and previous program manager is being recognized by our winning the 2013 “Award for Excellence in Technology Transfer”. There are over 700 programs that can compete for this award.

The WFM RD&A staff looks forward to meeting the challenges of 2013 with integrity, professionalism, safety, and mutual respect as our core values. We will continue to focus on our mission to sponsor and guide the development and application of wildland fire scientific knowledge and develop decision support tools for wildfire and fuels management. We will serve as a primary point of contact for communication between scientists and participating field managers, and as an advisor to programs administrators at local, regional, and national levels.

Tim Sexton,
Program Manager



Wildland Fire Management RD & A
Rocky Mountain Research Station
FY 2012 Organization Chart



RD&A staff, RMRS positions

DOI Partnership positions assigned full-time

S&PF positions

Who We Are, Where We Are

The WFM RD&A is part of the Rocky Mountain Research Station (RMRS) but headquartered at the National Interagency Fire Center (NIFC). RMRS hosts the WFM RD&A Program Manager, the Program Support Assistant and six other permanent positions working in Fire Science and Decision Support Development. The US Forest Service Washington Office Fire and Aviation Management (WO-FAM) program provides seven full-time individuals to the WFM RD&A as part of the National Fire Decision Support Center (NFDSC) and the National Interagency Fuels Technology Transfer (NIFTT) group Program Coordinator. The Department of Interior funds three positions, two Fire Application Specialists are funded by the the Office of Wildland Fire (OWF) as National Park Service FTEs while the third was funded by the National Park Service and the Bureau of Indian Affairs as a GIS Specialist. Much of the WFM RD&A team is virtual, working from offices across the western United States.

2012 was a year of transition with many changes in personnel. In January, the Program Manager, Tom Zimmerman, retired. Tom is credited with building the WFM RD&A into the organization that it is today. Jeff Jones managed the National Interagency Fuels Technology Transfer program, and retired in August after many years of hard work and dedication. His insight, long-term perspective and thoughtfulness will be missed. Laurie Kurth moved to the Forest Service Washington Office as an Applied Fire Ecologist, and we will remain in close coordination with her in the future. Lastly, Rob Seli, the WFDSS business lead will be retiring in January 2013. He has been a key player in behind-the-scenes WFDSS development, continually looking for new innovations, coordinating with other projects and programs, and moving the project forward. Although a transition plan is in place for Rob's retirement, the WFM RD&A organization will not be the same without him. We congratulate them all in their new endeavors and wish them the best! We also want to acknowledge and thank them for contributions to the success of the WFM RD&A.



In June, 2012 we welcomed Timothy Sexton as the Program Manager for the WFM RD&A to his duty station in Boise, ID. Tim comes to the WFM RD&A from his most recent position as the District Ranger on the LaCroix Ranger District, Superior National Forest. He brings national, regional and local leadership experience in fire policy and management, as well as actively engaging with the fire science community to advance solutions to the most important issues facing land managers. Tim has served on numerous national interagency task forces, and strategic planning efforts including the National Cohesive Wildland Fire Management Strategy and National Wildfire Coordinating Group Committees. His efforts have helped to align policies and procedures among agencies, streamline efforts, and reduce complexity of fire management across boundaries. We welcome Tim to his new role within the WFM RD&A.

Kestrels and GPS units are now accompanied by even more high-tech equipment on the fireline. It's more and more common to see firefighters with electronic tablets, smartphones, and remote data uplinks.



Support to the field is enhanced with more computing power and connectivity than ever before. This summer, Ben Butler (WFM RD&A) and Sam Amato (WFM RD&A) provided Decision Support to the Great Basin.

Advancing Fire Technology and Support in 2012

In 2012, four different regional decision support centers were set up, a decision-support phone line to assist with decision-making and analyses was staffed 7 days a week, utilized many trained call-when-needed analysts, and trained detailers in providing decision-support assistance. The detailer support helped the WFM RD&A with staffing throughout the entire fire season, not only helping to provide service to the field but also allowing hands-on training. The WFM RD&A staff had opportunities to participate with Incident Management Teams in various capacities that included: decision documentation, long-term fire behavior analyst, operations section chief, fire behavior analyst, field observer, firing boss, IC Type 4, and engine boss. These assignments have been critical in ensuring the WFM RD&A remains engaged and informed of users' needs.



The WFM RD&A continues to focus efforts on expanding and further refining decision support services. The Wildland Fire Decision Support System (WFDSS) is continually being updated to provide an improved user interface including training that is hosted in various media formats and ongoing technological enhancements. The overall use of WFDSS and the new creative ways the data are being used continues to demonstrate the benefit of this program. The 2012 fire season saw new uses of the information and an expansion of ways to use the data. To date, state and federal land management agencies have entered over 48,000 fire incidents in WFDSS Production with 14,500 incidents entered in fiscal year 2012. Never in the history of fire management have fire managers had so much information accessible so quickly.

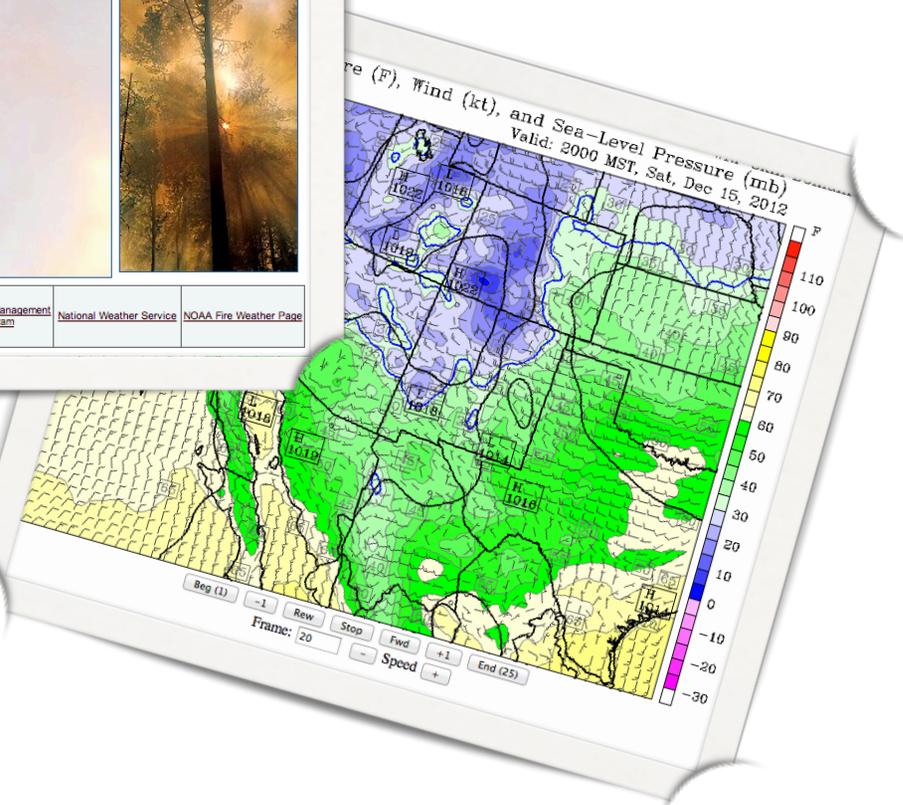
The Rocky Mountain Center (RMC) is providing products for the field (weather and smoke). These efforts have been coordinated with Predictive Services, The Air Fire Team and the National Academy of Sciences.

The National Interagency Fuels Technology Transfer program (NIFTT) is becoming more and more integrated within the WFM RD&A, as staff continue to work and evaluate the various models and training.

Need Fire Weather? Visit

www.fs.fed.us/rmc/

Users of the RMC website can access fire-weather products in a customized format based on their individual user profile. Users can easily obtain detailed weather information, including smoke forecasts for their region of the country with a few simple mouse clicks.



What We Do

There are five focus areas that are chartered for the WFM RD&A, to guide the definition and scope of projects. This section describes what we do and how we do it. The work of the WFM RD&A in FY12 has focused on Integrating Research and Decision Support Systems, Continuing Improvements to Decision Support Systems, Incident Support, Technology Transfer, and Teaching Others and Developing WFM RD&A Staff.

1. Integrating Research and Decision Support Systems

The Rocky Mountain Center (RMC)–Mesoscale Fire-Weather Research, Predictions, Development, & Delivery

Fire-weather forecasts are now generated for short-term and mid-term time frames. Short-term forecasts go out to 3 days (75 hours) and are produced by the new NCAR WRF model at 8-km resolution, while mid-range forecasts go out to 7 days (160 hours) and are generated by the MFF meso-scale model at 12-km resolution. Both weather forecasts cover the entire Conterminous USA. Fire-danger (NFDRS) indices are now forecast out to 7 days using output from the MFF model. In addition, RMC produces smoke dispersion forecasts in a Google Earth (KMZ) format using the latest version of the BlueSky Modeling System. Smoke forecasts were extended from 2 to 3 days and are based on weather fields generated by the WRF and MFF models. The web interface to the RMC point-forecast product was upgraded to Google Maps to allow users a much easier navigation and the ability to quickly find target points. RMC received positive feedback from Predictive Services in regard to the new fire-weather products and upgrades. Work with the Predictive Services Group to incorporate RMC's fire-weather intelligence and data stream into the mid-range fire risks products of Predictive Services at a National Level.





NFDSC Seminar Series

A new, internal monthly Seminar Series for the NFDSC facilitates communication between research scientists and developers of field fire applications. The WFM RD&A organized the virtual seminars in a presentation/Q&A format. Topics included: “Estimating US Federal Wildland Fire Managers’ Preferences Toward Competing Strategic Suppression Objectives” by Dave Calkin, NFDSC; “Fire Modeling Fundamentals Update” by Mark Finney, NFDSC; “Firefighter Exposure, Production Capacity and the Dashboard” by Dave Calkin (NFDSC); Recent and Ongoing Applications of a Spatial Risk Assessment at Multiple Planning Scales” by Matt Thompson (NFDSC); “Human Factors and Risk Management” by Anne Black (NFDSC); and “Recent Work with FPA” by Darek Nalle. The Seminar Series has been successful in opening lines of communication within the NFDSC.

Non-Forest Landscape Fuel Mapping Project

Dan Mindar (WFM RD&A) is involved with the Non-Forest Landscape Fuel Mapping Project, focusing on establishing protocols to map annual fuel model transitions in western non-forest landscapes. These transitions are triggered by changes in vegetation production (biomass, fine dead fuels) that may be due to drought or above-normal precipitation. The project will re-classify existing LANDFIRE surface fuel models where environmental conditions indicate a need. Future application of the transition matrix holds promise for improving fire modeling results, and may be used with other forecasting indices to forecast fire risk on western rangelands. Dan has worked closely with Research Ecologist Matt Reeves (RMRS) to identify local subject matter experts (Fuels Specialists) to provide input as to how these fine fuels transition in particular geographic areas.

Incorporating New Research in Decision Support: Growing Season Index

Live Fuel Moisture (ratio of water weight to dry plant material) influences wildland fire growth and fire spread model outputs. Live fuels are measured by clipping, oven drying and weighing field samples. These results are intermittent and can vary considerably over short distances; therefore, calculated inputs from the National Fire Danger Rating System were traditionally used as for fire behavior model defaults. But calculated values were notoriously low, contributing to over-prediction. Matt Jolly (RMRS, Missoula Fire Lab) developed an improved live fuel moisture calculation called the Growing Season Index (GSI) using calculated moisture, temperature, and hours of daylight. Regional inputs for calculating GSI were developed by Mitch Burgard (WFM RD&A) and others, and GSI was incorporated into all of the WFDSS fire behavior modeling systems in Spring 2012. Feedback from Fire Behavior Specialists has been favorable regarding the new defaults and subsequent improvements to model outputs. Work will continue in FY13 to further refine the live fuel moisture calculations at a finer, more localized

scale.

2. Continuing Improvement to Decision Support Systems

Testing Mobile Technologies

The WFM RD&A was involved in a partnership with the Mobile Technologies Integration group to test iPads for Fire and Aviation Management applications. Phase 1, completed in January 2012, indicated that the iPad doesn't fully replace the laptop, but is nevertheless a viable tool for fire managers. Benefits of the iPad include: increased mobility, field worthiness, quick referencing and note taking. Limitations of the device include: less ability to fully utilize map programs, Google Earth, and fire behavior programs and applications. In response to the feedback generated from this study the Forest Service Chief Information Office contacted the Mobile Technologies group regarding the development of an application to support fire management. This development is still in the initiation phase and will hopefully be ready for beta testing during the 2013 field season.

WFDSS Lite

WFDSS Lite is intended to give managers a quick way to view key components of a decision, update the periodic assessment or approve a decision from a mobile device. While additional tasks can be performed using WFDSS Lite, the focus of it's development was for Agency Administrators. The Lite version has no access to the map pages, analysis maps, intelligence information or data management tabs but still provides a valuable mobile interface that is useable on all mobile devices without being specific to a single operating system. This functionality allows managers increased mobility while keeping informed about fire decisions.

RMRS Dashboard Accomplishments

RMRS and the WFM RD&A cooperated with WO-FAM to develop what has become simply known as the "Dashboard", a prototype for a high-level risk-informed web-based view of wildland fire activity. The Dashboard is targeted for the national leadership, and compiles, combines, synthesizes, and displays data from existing fire systems (ROSS, ICS-209, WFDSS) in a simplified way without requiring additional manual inputs. The Dashboard pulls data from the contributing systems and updates as frequently as every 10 minutes. Various metrics and concepts developed at RMRS through the National Fire Decision Support Center are utilized in the Dashboard, including Probability of Containment, Values at Risk, FSPro, Exposure Index, and Stratified Cost Index. Continued development for the 2013 fire season will focus on early identification of significant fires using a combination of expert knowledge and existing data, reducing the latency of data updates, and prioritization of significant fires.



Success Story: Decision Support for Bureau of Indian Affairs

Working with the Bureau of Indian Affairs Fire Planning team, the WFM RD&A provided GIS and technical assistance to help create a spatial fire management plan for the Eastern Nevada Agency. These efforts set the stage for future spatial FMP creation and served to build a template. Ben Butler (WFM RD&A) also provided support to create, edit, and process existing Fire Management Unit (FMU) polygons. In many cases individual Agencies/Reservations do not have strong GIS support on the ground. BIA Fire Planners requested support in building and entering the pre-planning information (FMU polygons, Strategic Objectives, and Management Requirements) into WFDSS. These efforts ensure that when large, extended attack fires occur in Indian Country the data are in WFDSS and are ready to use to make strategic decisions to manage these incidents. Throughout fiscal year 2012 the WFM RD&A data management staff assisted the BIA's Western, Navajo, Southwest, and Rocky Mountain Regions.

Spatial Fire Management Plan Prototype

Members of the WFM RD&A Team were involved with spatial fire management conceptual planning in WFDSS. Along with staff from the Payette National Forest, the group examined fire direction in the Land Resource Management Plan (LRMP) to see how they could spatially represent the information in WFDSS. It was important not to vary from the direction provided in the LRMP, as this is the guiding policy document for the Forest. The group examined the strategic objectives for the Payette NF and summarized them in two new shapes. The Payette NF utilized the new shapes and re-vamped their forest guidance through the 2012 fire season; testing the viability of this new process. The WFM RD&A continues to work with the Interagency Fire Planning Committee (IFPC) to outline future developments to WFDSS using both the Payette NF lessons learned and the work being completed by DOI Bureaus to create spatial fire management plans.

Partnering With Geographic Area Editors

Geographic Area Editors (GAEs) representing all federal wildland fire management agencies are an integral WFM RD&A partner, facilitating and coordinating decision support for the field. The WFM RD&A hosted monthly GAE conference calls to facilitate two-way communication. The group discusses items that may impact the field and decision support, including current fire issues, upcoming WFDSS changes, training needs or opportunities, and geospatial data updates. The call provides an opportunity for the GAEs to discuss successes or hurdles with field use and integration of various decision products. In addition to monthly conference calls the WFM RD&A hosts an annual After-Action Review (AAR), allowing open discussion and feedback regarding the previous fire season as experienced at the regional or field level. Previous AARs have provided specific feedback regarding WFDSS enhancements and operating procedures; as a result, the WFM RD&A and WFDSS continue to improve decision support to the field. Throughout the 2012 field season, WFM RD&A supported or coordinated with all geographic areas to assist.

Validation of Near Term and FSPro Fire Modeling Systems

Throughout 2012, work has been accomplished by the WFM RD&A to provide validation of the Near-Term Fire Behavior Model (NTFB) and the Fire Spread Probability Model (FSPro) in WFDSS. In late 2012, every wildland fire incident in WFDSS Production since 2010 will be run, from the date of discovery, through a 5-day simulation using the NTFB Model. Outputs will be analyzed to validate the model against actual fire spread to improve the default model inputs. After calibration, NTFB may be automated to run an analysis on every new 2013 fire that is input into WFDSS. WFM RD&A staff are currently running NTFB on recent fires, establishing model inputs, building file structures and working with programmers, developers and system administrators in preparation for this effort.

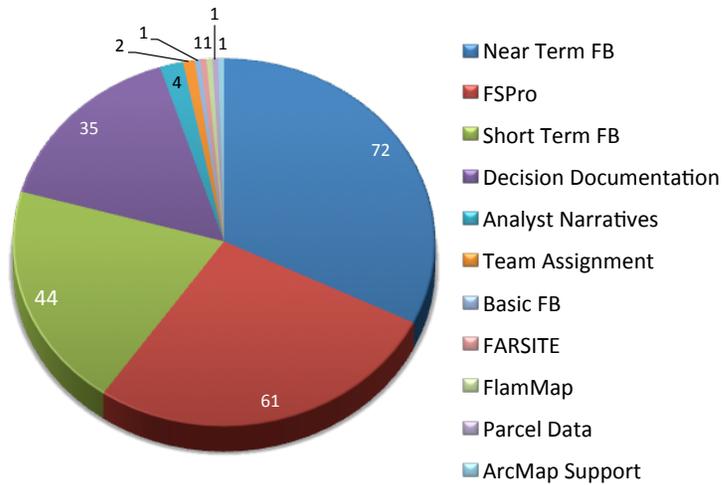
FSPro Validation compares two sets of 90 FSPro runs that had been completed in 2007, 2008, and 2009 with fire perimeter files 7 to 14 days apart and uninfluenced by suppression. The analysis compares the original inputs from a trained fire behavior specialist with output from a “default” FSPro run for the same fire, utilizing a standard set of parameters. The comparisons will help determine which FSPro parameters are sensitive to user-inputs, where better defaults could be provided to the user, or where parameters could be automated without negatively impacting results. Preliminary results suggest analysts tend to use parameters that over-predict the probability of fire spread, while the initial set of defaults tend to under-predict. Testing will continue throughout FY13.

A Project to Evaluate Costs and Benefits on DOI Fires

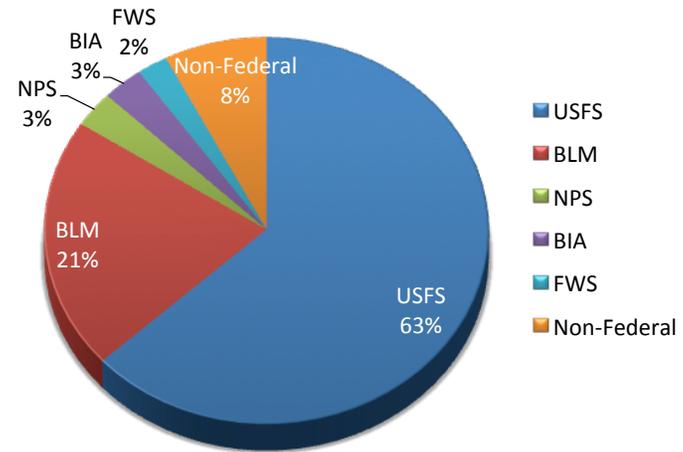
In coordination with the DOI Office of Wildland Fire (OWF), the WFM RD&A has been working to evaluate the costs and benefits associated with a select number of wildland fires that have occurred on areas managed by the DOI. A random sample of fires from the BLM, BIA, NPS, and FWS ranging from greater than 0.1 acre to greater than 5,000 acres were modeled in Near-Term Fire Behavior (NTFB) in WFDSS and the Fire Spread Probability model (FSPro) modeling systems to assess the value at risk and fire size that could have resulted in a fire had not been suppressed. The stratified cost index (SCI) is also being used to evaluate actual versus historical costs based on the final fire size. This project is ongoing and will continue throughout FY13.



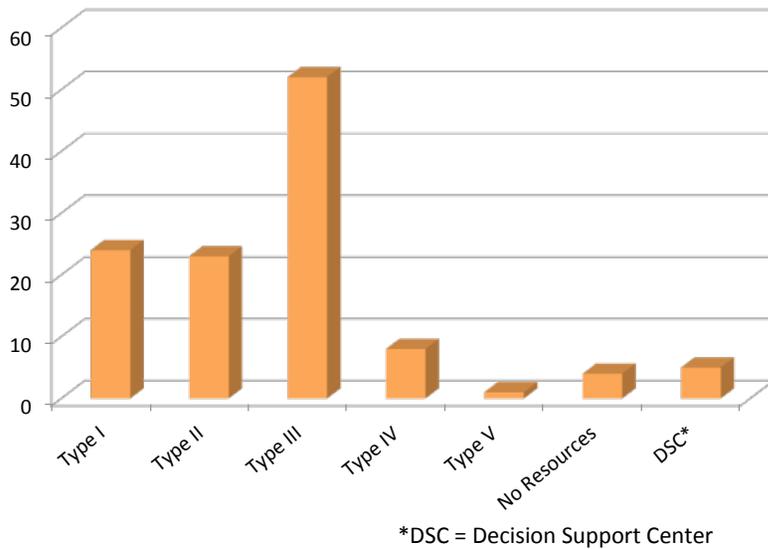
Support Products Provided - FY2012



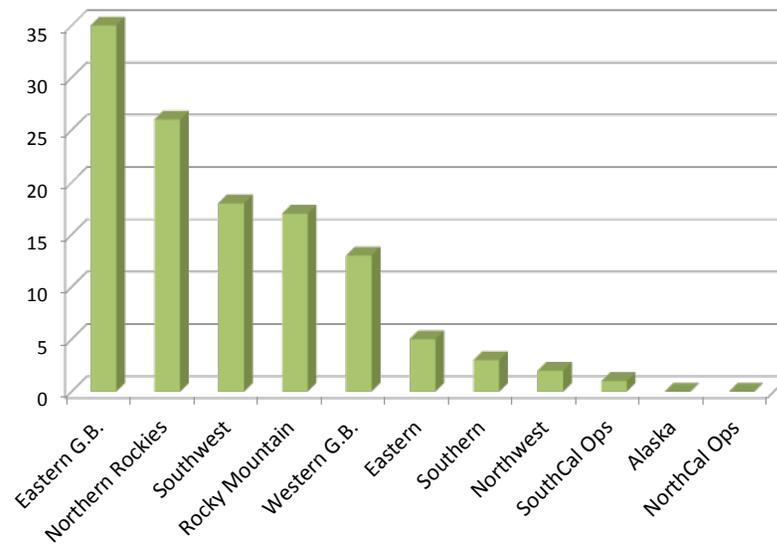
Support Provided by Agency - FY2012



Incident Type Supported - FY2012



Support by Geographic Area - FY2012



3. Real-Time Fire Management Support

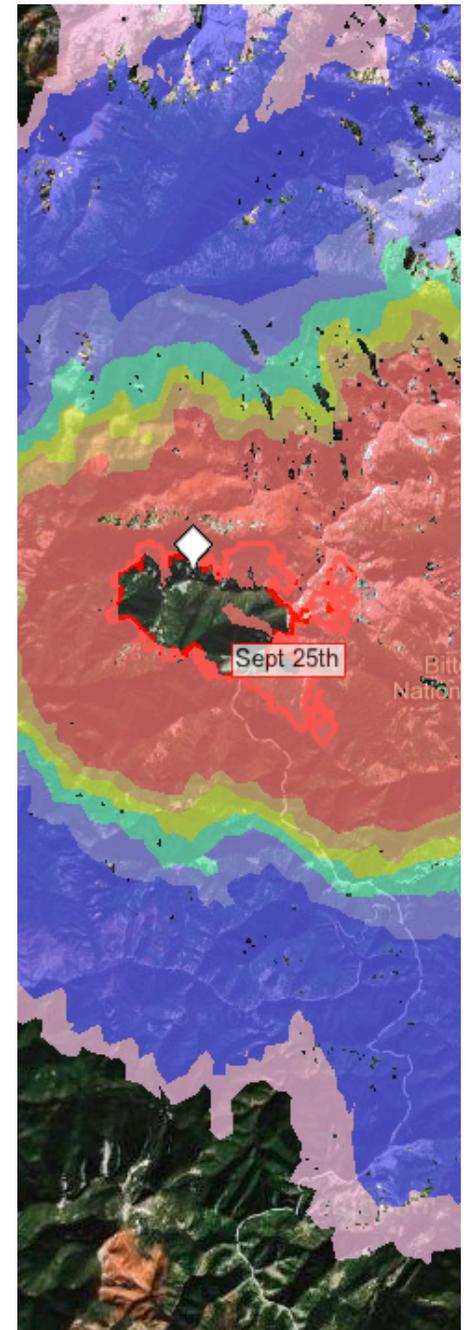
Incident-Level Support

In FY12 the WFM RD&A provided virtual and on-scene support to 113 incidents in nine Geographic Areas. The type of support varied depending on the needs of the incident. Figures on the preceding page summarize the support products provided, the agency distribution, the incident type, and the geographic area. The tools and products most frequently supported by WFM RD&A analysts include Near Term Fire Behavior analyses, FSPro analyses, Short Term analyses, and Decision Documentation support. Other requested products and support included Analyst Narratives, Team Assignments, Basic Fire Behavior, FARSITE, FlamMap, Parcel Data support, and ArcMap Support.

The WFM RD&A supports all agencies, fire types, and geographic areas. The majority of the incidents supported were USFS fires (63%), with BLM making up the next highest majority at 21%. Non-Federal fires were supported for the State of Montana, the State of Idaho, Southern Idaho Timber Protection Agency, Albany County WY, the State of Wyoming, the State of Washington, Boulder County CO, and FEMA. Most requests in FY2012 were to support Type 3 incidents for a total of 52 fires (44%). Type 1 and 2 fires were the next most frequently supported at 24 (21 %) and 23 (20%) respectively. Most of incidents the WFM RD&A supported were in the Eastern Great Basin Geographic Area (35 incidents). Other 'hot spot' areas included the Northern Rockies (26 incidents), the Southwest (18 incidents), the Rocky Mountains (17 incidents) and Western Great Basin (13 incidents).

Virtual Support

The WFM RD&A is often able to provide support to incidents virtually, rather than directly on-scene at the incident. This can result in faster support timeframes and reduced incident costs as no travel is needed. In some cases analysts are able to support more than one incident at a time by taking advantage of down-times when supporting incidents, resulting in greater efficiency of analysts. However, sometimes on-scene incident support is requested to better aid communication and facilitates more in-depth understanding and knowledge of specific incident concerns and needs. In FY2012 the WFM RD&A supported 102 incidents virtually from locations other than on-scene and supported 11 incidents while working on-scene at a fire's location.



Success Story: Decision Support for the Great Basin MAC Group

For the first time, a Decision Support Center was staffed by the WFM RD&A at the request of a MAC Group to support decision-making at broad, strategic levels. Decision Support Centers were set up for the Great Basin GACCs (Eastern and Western Great Basins combined) on two separate occasions as fire activity increased in the geographic area. Analysis products were produced to support local units, Incident Management Teams, Area Command and the MAC Group. To aid the MAC Group with decisions on allocation of scarce resources on emerging fires, the Decision Support Center produced Near Term Fire Behavior assessments for fires of concern overlaid on maps displaying values information such as buildings, power lines, gas lines, major highways and land ownership. This helped the MAC Group assess fire potential over the next several days and potential impacts to values, allowing the MAC Group to prioritize resources where fire threats were the greatest. As out-of-area aviation resources were released, the Decision Support Center developed a Priority Release and Reassignment List based on each geographic area's Predictive Services 7-Day Significant Fire Potential Outlook to prioritize reassignment of aviation resources to areas with the greatest fire potential.

Support Centers at Geographic Area Level

In addition to single incident support, the WFM RD&A provides on-going support to larger areas as requested, such as a Geographic Area or regional office. In 2012 the WFM RD&A supported five of these Decision Support Centers (DSC): four Geographic Area Coordination Centers and one Forest Service Regional Support Center.

Decision Support Centers were established in the following areas:

- Southwest (Albuquerque, NM): June 17th -July 1st.
- Rocky Mountains (Denver, CO): June 26th- July 8th.
- Great Basin, Multi-Agency Coordination Center Support (Salt Lake City, UT): July 9th-17th.
- FS Northern Rockies (Missoula, MT): August 2nd-15th.
- Great Basin, Multi-Agency Coordination Center Support (Salt Lake City, UT and Boise, ID): August 10th- 24th

Support provided at the centers varied depending on the needs of the requesting unit. In general, support included Decision Analysis Support, Decision Documentation Support, Information Dissemination, and Situation Monitoring. In addition to the DSC Coordinator, centers were staffed with Fire Behavior Analysts (FBAN), Long Term Analysts (LTAN), Geospatial Analysts (GSAN), Strategic Operational Planners (SOPL), WFDSS Decision experts, and smoke modelers depending on the area's needs. Center coordinators and analysts coordinated with on-going and emerging incidents, provided briefings and materials to incoming fire personnel and agency representatives, produced fire behavior alerts and products, provided guidance on policy questions, and worked with smoke management personnel, GACC personnel, and Predictive Services.

Mentoring

The WFM RD&A provided mentoring and training to 57 individuals while supporting incidents in FY12. One of the roles of the WFM RD&A within the framework of the National Fire Decision Support Center (NFDSC) is to provide practical mentoring and other means to strengthen decision support capacity at the regional and field levels, and achieve refresher and currency training for non-WFM RD&A analysts. This goal is accomplished by pairing or grouping WFM RD&A analysts with local and other non-WFM RD&A analysts while supporting incidents.

Providing Help to WFDSS Users

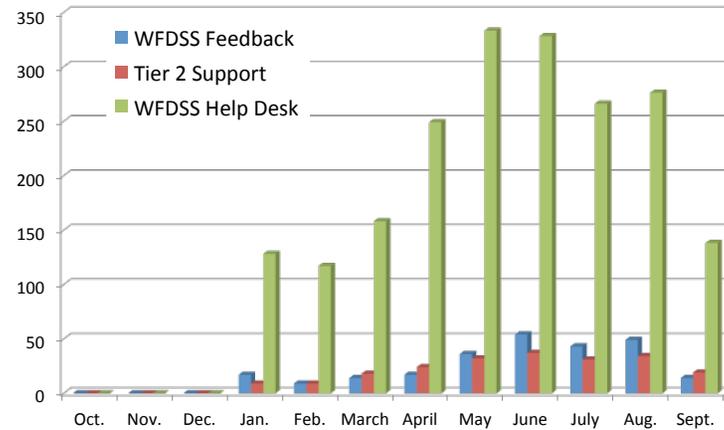
The WFM RD&A staff provide year-round, daily support to the field through formal and informal means. Support varies widely, from answering technical questions about how the WFDSS program works, to providing information about fire modeling systems and training, to providing policy guidance and references. Formal means include the:

- WFDSS Help Desk, through helpdesk@dms.nwccg.gov or 1-866-224-7677
- Tier 2 Support (when above Help Desk is unable to resolve questions)
- WFDSS Feedback, through the WFDSS system for logged-in users by selecting the “Feedback” button

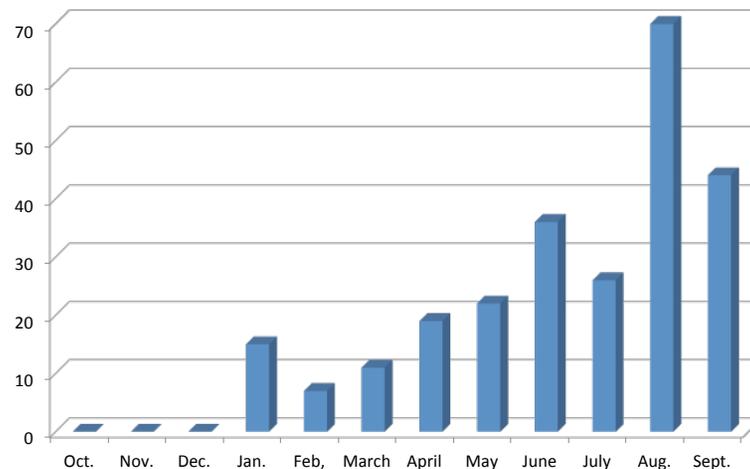
The top figure to the right breaks down the formal support provided to the field by month in FY12. The total number of formal support tickets for FY2012 was 2,459. Documentation of these statistics began in January of 2012.

Informal support includes phone calls, emails, and face-to-face communications WFM RD&A personnel have with individuals outside of the formal methods listed above. The figure on the lower right shows informal support provided to the field by month in FY12--the total number of informal support incidents was 250. Documentation of these statistics first began in January of 2012.

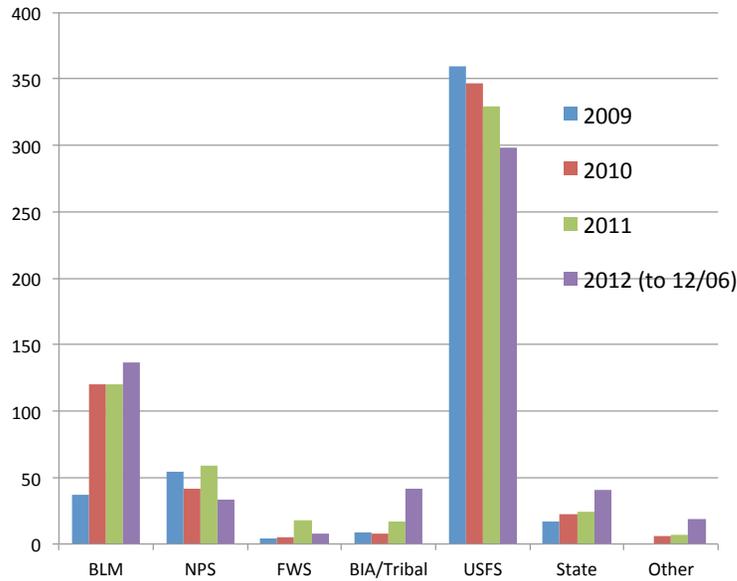
Monthly Formal Support Tally - FY2012



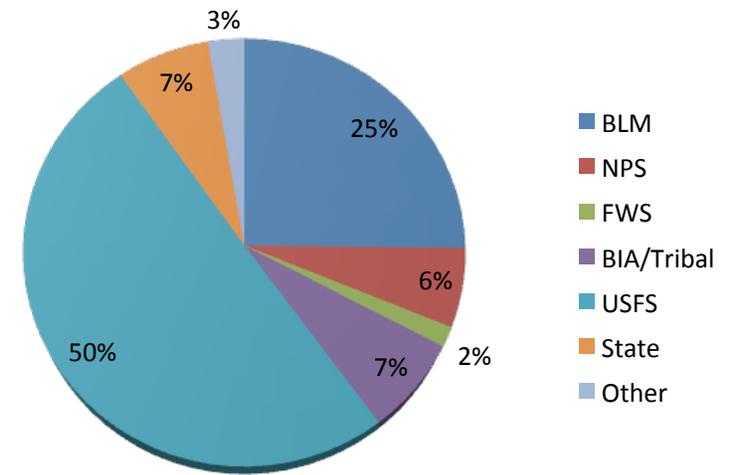
Monthly Informal Support Tally - FY2012



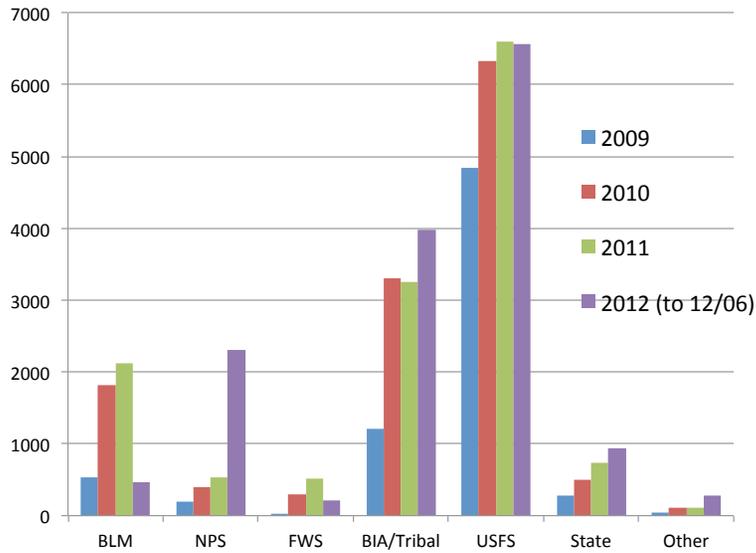
WFDSS Decisions 2009 - Dec 2012



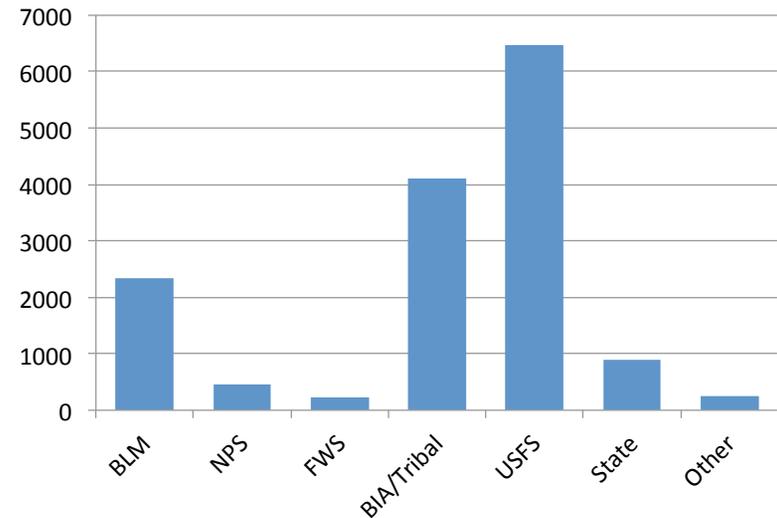
FY 2012 Incidents with at Least 1 Decision



WFDSS Incidents by Calendar Year



Number of Incidents in WFDSS for 2012



WFDSS Use Statistics for FY12

In FY12 (October 1, 2011 through September 30, 2012), 14,759 fire incidents were entered into WFDSS, which is 1,000 more than last fiscal year. The majority are from the five federal land management agencies, though there continues to be use by state, county, and local governments who used WFDSS for over 1,152 incidents in the same period (see graph opposite, lower right). For all incidents entered into the system, 584 had at least one “published” decision; 56 of these were from state and local governments (see graph opposite, upper right). WFDSS has tracked calendar year statistics since 2009. WFDSS incidents have increased for most agencies over the past four years, either due to numerous fire starts or agency policy requirements (see graph opposite, lower left). There is not a universal trend in the number of published decisions by agency (see graph opposite, upper left) due to early adoption of WFDSS by some agencies, varying fire load by year, or policy direction as to when decisions need to be published.

There were 5,839 fire behavior analyses in WFDSS in FY12; 1,733 of these were “Completed” as acceptable to inform decision-making. WFDSS was designed around a risk-based deliberation process, which can be supported by fire behavior analyses. There is currently no way to quantify whether decision-makers utilize risk-assessment outputs. However, the general trend is that more fire behavior modeling is occurring in the WFDSS interface each year.

Data Management to Support Field Users and Decisions

The WFM RD&A continued providing management oversight of the geospatial data sets included in WFDSS, processing and updating 36 individual data sets. Several new data sets were included in WFDSS based on specific requests from individual agencies. These data sets were typically identified as major drivers of decision-making on large wildland fires. One such data set, provided to the WFM RD&A by the USFS Fire and Aviation Management, the Aerial Fire Retardant Avoidance layer was included in WFDSS in April of 2012; in time for the peak wildfire season throughout much of the country. Data sets like these ensure that fire managers and decision makers have the necessary data to make better-informed decisions in a timely manner.

Efforts to better portray structure locations and the potential for these structures to be affected by fire continue to be a high priority item for the WFM RD&A Data Management staff. Throughout the peak of the Colorado fires the WFM RD&A continued working with the FGDC Cadastral Data Sub-Committee. Working in unison with this group the WFM RD&A was able to obtain attributed parcel data from many of the counties affected by large wildfires. These data were then turned around in a matter of days and provided back to fire managers within WFDSS where they were then leveraged to steer strategic decisions being made on the ground. Throughout this process every effort is made to be agile enough to handle increases in data needs when fire season presents the opportunities and the WFM RD&A was able to deliver the data to the field in a timely and accurate manner.

Publications and References to Support Fire Management

Line Officer Guide for USFS

The Draft Line Officer Desk Reference Guide for Fire Program Management was identified by the Forest Service National Line Officer Team for Fire (LOT) as a high priority for 2012. The LOT determined a need for Forest Service line officers to have a guide to help maintain knowledge and understanding of roles and responsibilities for the fire management program. Development of the guide was a coordinated effort between The WFM RD&A and a sub-group of the LOT. Information in the reference guide is not new, but extracted directly from existing directives, policy, and guides; referencing the original direction (Forest Service Manual, Forest Service Handbook, and Interagency Standards and Guide (i.e. the Red Book)) consolidated in one location. Feedback was gathered throughout the 2012 field season and will be used to update and improve the document in FY13. Look for the most recent version of the Desk Reference guide at the WFM RD&A website: <http://www.wfmrda.nwcg.gov>

Decision Making for Wildfire Incidents: A Reference Guide for Applying the Risk Management Process at the Incident Level

The WFM RD&A co-sponsored a reference guide with the NWCG Fire Use Subcommittee to assist fire managers, resource specialists, and agency administrators in developing and communicating timely and sound risk-based

Tools	Values Inventory (VI)	Values at Risk (VAR)	Stratified Cost Index (SCI)
Time Period of Interest (must be same as analysis period)	1 – 3 days	Next 7 – 30 days	Immediate and cumulative
Time Needed to Complete Analysis	Less than one minute upon completion of STFB and NTFB, immediate upon drawing planning area	Completed with FSPPro simulation	A few minutes
Analysis Type	Automated	Automated	Manual
What are the Values at Risk near this fire?	Lists the number of values by specific type within a planning area or STFB/NTFB Arrival Time footprint.	Lists the number of values by specific type and their probability of being affected by fire.	
How do costs on this fire compare to similar fires?			SCI is a table that compares costs of similar fires based on jurisdiction fuel model at point of ignition, and fire size.
What values are in the predicted fire movement over the next day or two?	X		
What is the probability and count of values being affected in the next week or two?		X	
Most values in FMUs are included. Primarily values related to land management agencies	X	X	
Buildings on federal land	X	X	
Local values data preloaded as Unit Shapes in the fire's vicinity such as species of concern, no dipping areas, specific habitat etc.			
Partial county building cluster data	X	X	

Among many other things, the Line Officer Guide provides information about how to choose the right tools for an economic analysis.

decisions for managing wildfires. Although it will be formally published in the spring of 2013, this draft document represents the work of several fire professionals who developed content, integrated existing references, and sought feedback from others with experience in wildfire decision making, risk management, and long-term incident planning. The publication provides guidance on the risk assessment and risk management process, flow, and points to consider in making informed, sound risk-based decisions. It emphasizes the thought process behind sound fire management decisions in a risk-management framework without tying the process to a specific decision documentation structure (e.g., the Wildland Fire Decision Support System [WFDSS] or former Wildland Fire Situation Analysis [WFSa]). The guide serves merely as an aid in determining methods to make fire management decisions consistent with the policy directives to base those activities on sound risk management. You can find a copy of the document at the WFM RD&A website: <http://www.wfmrda.nwcg.gov>

Planning Rules, Terminology, Interagency Fire Planning Committee

Throughout fiscal year 2012 the WFM RD&A had representation on the Interagency Fire Planning Committee (IFPC). The group worked on several projects with the IFPC: providing updates on the new USFS planning rule, helping to define planning terminology, providing USFS planning policy subject matter experts, supporting the Spatial Fire Management Planning effort and developing fire planning learning pathways for the Wildland Fire Institute (WFI). WFM RD&A's involvement with the spatial planning efforts prompted new development within WFDSS to accommodate recommendations from the field after testing the spatial planning concepts.



Website Improvements

This year improvements were made to the WFM RD&A website, www.wfmrda.nwccg.gov, to make information easier to find. Among these improvements was the division of the site into WFM RD&A focus areas: Decision Support; Climate, Weather & Smoke; Fuels & Fire Effects; Decision Support Tools; and "About the WFM RD&A." Banners with the most relevant news and updates make site navigation simpler and more intuitive. WFM RD&A continues to incorporate new programs into the website, such as National Interagency Fuels Technology Transfer (NIFTT) and Rocky Mountain Center (RMC).

Decision Support



- **Decision Making Guide**
- **Line Officer Guide**
- **Fire Decision Support**
- **Reference & Guidance**
- **WFDSS GA Editors**
- **Data Management**

Technology Transfer & Training



- **Tools - Software**
- **Training**
- **NFDSC**
- **NIFTT**

Climate, Weather & Smoke



- **RMC**
- **AirFire Group**
- **Air Quality Tools**

Fuels, Ecology & Fire Effects



- **FRCC**
- **LANDFIRE**
- **Learning Pathways**

Success Story: Training and Mentoring

My detail with WFM RD&A began as a simple two week virtual detail from my home office. At the end of the second week I was given the opportunity to travel to the Eastern Great Basin to do further analysis with other WFM RD&A folks. So all told, my detail was nearly 4 weeks long. My experience during this time has opened my eyes to parts of the fire world that I was not fully aware of. I had the opportunity to be involved in trainings and discussions that expanded my knowledge base of fire behavior analysis as well as my ability to communicate effectively. I feel that this experience has helped me professionally on many levels including my geospatial fire analysis skills, written and verbal communication skills, and my understanding of the fire organization and how it branches across agency boundaries."

--Kaari Carpenter, a WFM RD&A detailer, and now the new Program Manager for the National Fire Desk



The Kafue training was a combination of classroom instruction, demonstrations, and field exercises.

4. Technology Transfer

Geographic Area Fire Modeling System Workshops

WFM RD&A staff participate in a variety of Geographic Area-based WFDSS and Fire Behavior Modeling Systems workshops to teach Near-Term and FSPro along with WFDSS navigation. WFM RD&A staff typically support these workshops in person, however in some cases it was more economical and as effective for WFM RD&A staff to participate via web conferencing tools like GoToMeeting to provide the training. In FY12, Tonja Opperman (WFM RD&A) helped teach a workshops in Alaska, Sam Amato (WFM RD&A) taught in the Southwest, and Morgan Pence (WFM RD&A) taught in the Pacific Northwest.

Detailer Program for Analysts

This year the WFM RD&A paired inexperienced analysts with experienced analysts to provide mentoring in the areas of fire science application, fire modeling, and fire management. Additionally, the WFM RD&A focused on building the capacity of the fire management community at the local level through a two-week detailer program during the busy fire season. Detailers work side-by-side with analysts to run many of the fire behavior modeling systems in WFDSS and assist fire managers with decision support. Five detailers supported the WFM RD&A in 2012, and all noted a positive experience (See “Success Story” on the previous page).

Using Technology to Improve Fire Management in Africa

The WFM RD&A Charter includes an international information sharing and assistance component. In FY12, Tonja Opperman (WFM RD&A) was invited by Forest Service International Programs to participate in two missions to Kafue (kah-FOO-ee) National Park in central Africa. Kafue is a 5.5 million acre protected area in western Zambia with a seasonally flooded river system supporting elephants, cheetah, lion, antelope, wild dogs, and hundreds of bird species. The park is plagued by frequent human-caused fires and has tried to develop a blacklining fire break network to curtail fire spread during the worst part of the fire season. The first mission, in October 2011, was to ground-truth remote sensing burn severity data provided by the Remote Sensing Applications Center (RSAC) to determine if it is a viable strategy for monitoring fire history; the team determined it was indeed an effective way to see when and where fires occur, as well as size and severity. This will aid the park in targeting unwanted fires. A second trip took place in May 2012 in partnership with The Nature Conservancy to teach fire application and monitoring techniques to a Kafue staff of 25 game wardens, ecologists, tour guides, and GIS specialists. Students learned techniques for igniting backing fires by monitoring wind direction and developing an appropriate firing plan, allowing them to achieve objectives quickly and safely.



FY12 New & Updated NIFTT Tools

Online Courses

- NIFTT Vegetation Dynamics Learning Pathway: a series of online and live courses designed to teach natural resource professionals how to use state-and-transition modeling concepts and the LANDFIRE models to predict vegetation change on real landscapes.
- Review and posting of NWCG course material for S-244 (Part I+II), S-491, and S-495 on the FRAMES web site.
- Fire Regime Condition Class (FRCC) Online Course
- Fire Regime Condition Class Mapping Tool (FRCCmt) Online Course
- Wildland Fire Assessment Tool (WFAT) Online Course

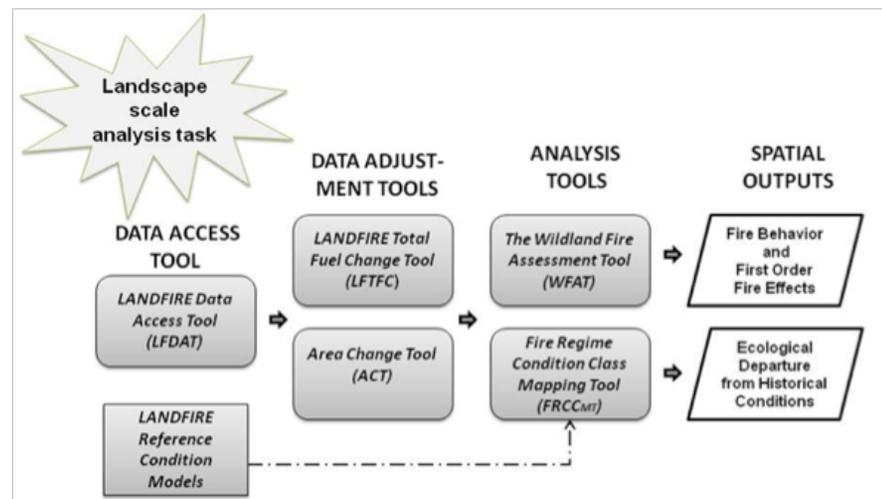
Tools at NIFTT.gov & fire.org

- Fire Regime Condition Class Mapping Tool (FRCCmt) version 3.1.0 for ArcMap 10, Tutorial and User Guide
- Wildland Fire Assessment Tool (WFAT) Version 2.2.0 for ArcMap 10, Tutorial, and User Guide
- Continued development work on FuelCalc
- Multi- Raster Reclassification Tool

The National Interagency Fuels Technology Transfer (NIFTT) Program

NIFTT became a component of the WFM RD&A in FY11 and is now incorporated as another focus of the organization in FY12. NIFTT coordinates technology development efforts and provides training regarding hazardous fuels and vegetation to transfer consistent, efficient, science-based assessment tools and training opportunities to the field. NIFTT's primary sponsor is Forest Service, Fire & Aviation Management, but additional funding is provided by the National Interagency Fuels Committee and LANDFIRE. NIFTT works closely with the University of Idaho, The Nature Conservancy, and the Fire Modeling Institute.

NIFTT tools are designed to help users learn how to access, edit, and analyze input data to assess fire behavior, fire effects, fire regimes, and ecological departure. All tools are compatible with ArcGIS software. Landscape-scale analysis requires spatial data inputs provided by LANDFIRE. NIFTT supports users by managing two websites (niftt.gov and frcc.gov) and a Help Desk, responding to questions pertaining to NIFTT tools, curricula, FRCC, and LANDFIRE. NIFTT provides training opportunities using a variety of media including online courses, classroom workshops, videos, and published guidebooks or tutorials.



WFDSS Content Management System

New "WFDSS 101" Lessons for Self-Study

Responding to users, the WFM RD&A created a series of online, downloadable WFDSS lessons to provide new and experienced users with a thorough and linear WFDSS training experience. The suite of lessons provides instruction through a combination of explanation and exercises, stepping a user through the development of a decision and its content. Although the lessons were intended to be used with a training incident that a user creates, WFDSS users are using the exercises as reference when developing documentation for real incidents. The field response for the lessons has been very favorable and additional lessons covering more topics will be added in the coming year.

WFDSS YouTube Channel Hosts Training Videos

The WFM RD&A provides numerous resources for users to learn and gain skills and abilities with WFDSS, the decision process, and the fire behavior tools within it. Beginning in May, short training videos were published on YouTube to aid users with the WFDSS fire behavior tools. Videos are accessed from the WFDSS Support Videos page on YouTube at: <http://www.youtube.com/user/WFDSSSupportVideos?feature=watch> Users can subscribe to the WFDSS Support Videos page to be notified when new videos are posted. Links to the videos are also available from the WFDSS Training page under the heading "Videos", http://wfdss.usgs.gov/wfdss/WFDSS_Training.shtml The videos are approximately 10 minutes each, there are 18 users subscribed to the site thus far, and videos have been viewed 378 times. Video topics include:

- FSPPro ERC Classes
- Initial Fuel Moistures
- FSPPro Winds
- FSPPro ERC Streams
- Weather & Wind Streams for Basic, Short Term, and Near Term
- Weather Station Selection for Short Term & Near Term
- Weather Station Selection for FSPPro
- Editing a Landscape
- Landscape Critique
- Creating & Utilizing Barriers and Masks
- WFDSS Fire Behavior Landscape Overview
- WFDSS Updates and Reminders Spring 2012



Organizational Representation

The WFM RD&A Staff provide representation on many committees, cadre, and working groups to enhance opportunities for technology transfer and personal development. The list below highlights the organizational representation of the WFM RD&A throughout FY2012.

- NWCG Fire Behavior Subcommittee Chair
- NWCG Fire Planning Subcommittee Representative
- NWCG Fire Reporting/209 Subcommittee Representative
- LANDFIRE Liaison
- NWCG Fire Danger Subcommittee Member
- Predictive Services/Intelligence Liaison
- RMRS Science Application and Integration (SAI) WFM RD&A Representative
- Fire Research And Management Exchange System (FRAMES) Liaison
- Air/Fire Group Liaison
- S495 Geospatial Fire Analysis, Interpretation, and Application Steering Committee Chairpersons, Cadre, Mentors, Coaches
- S590 Advanced Fire Behavior Interpretation- Steering Committee Chairmen, Cadre, Mentor, Coach
- Rx510 Advanced Fire Effects Instructor
- Geospatial Equipment and Technology Applications (GETA) Liaison
- National Incident Management Organizations (NIMO) Liaison
- National Performance Measures Task Group Members
- Interagency IT Roadmap Project Liaison
- USFS Mobile Technologies Integration for Fire & Aviation Management
- Fuels Transition Research Representative
- Northern Rockies Consortium Liaison
- NWCG Forest Service Executive Board Representative
- Cohesive Strategy Team Member
- Interagency Fuels Treatment Decision Support System Liaison
- NWCG Geospatial Subcommittee
- Wildland Fire Science Partnership Liaison
- Fire Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS) Representative
- Desert Research Institute (DRI) Liaison
- BLM Data Standards Committee Member
- Interagency Fuels Planning Committee Representative
- Technical Fire Management Representative
- Wildland Fire Institute Liaison
- Enterprise Geo-spatial Portal (Fire Common Operating Picture COP) Representative
- Fire Reporting Mobile Application Development Team Representative
- Dashboard WFM RD&A Representative



5. Training Others and Developing Our Staff

Many of the WFM RD&A staff participated on fire assignments related to Decision Support and fire behavior modeling. Some of the staff also had opportunities to pursue other interests related to their individual career development interests. Individuals within the WFM RD&A are encouraged to develop their skill sets in various ways.

Staff Rides

Tonja Opperman, as a former fire ecologist at Grand Canyon National Park had a unique opportunity to visit the North Rim with a cadre of current managers, past managers, NPS Intermountain Regional staff, and scientists from Northern Arizona University. The group toured prescribed burns and fuel treatments that were accomplished in the last 20 years, viewing maps and data depicting the history of management and fire on the North Rim and discussing future management options that consider landscape-scale fire effects and trends. According to recently published research papers, some mixed-conifer areas that have received multiple-entry treatments are now considered restored to the historic range of variability.

Joint Fire Sciences

Erin Noonan-Wright is staying current with fuel treatment research, analyses, and monitoring by working with managers and researchers on a Joint Fire Science Project, evaluating fuel treatment effectiveness in California. In coordination with the Western Wildland Environmental Threat Assessment Center (WWETAC) and the Adaptive Management Services Enterprise Team (AMSET), this project evaluates fuel treatment succession, effectiveness, and fire behavior for ten years of monitoring data encompassing 14 National Forests in California. Fuel treatments include mastication, prescribed fire and overstory thin with a surface fuel treatment in coniferous forests. In addition, all associated data, pictures, calculated fuel loading, summarized stand structure, and spatial data for each fuel treatment project will be delivered to each fire manager along with their monitoring data stored in FFI (Firemon/FEAT Integrated), to allow for further analysis and future monitoring.

Disaster Assistance Support

Laurie Kurth (former WFM RD&A) completed a two month detail working in the USFS Disaster Assistance Support Program (DASP) in Washington, DC in November-December 2011. She served as a Disaster Operations Specialist with the US Agency for International Development Office of Foreign Disaster Assistance, the avenue through which US assistance is provided to foreign countries during disasters such as the Japan tsunami, Indonesia volcanic eruptions, Tanzania flooding, and African drought. She reviewed grant proposals from non-governmental organizations to provide latrines, hand washing stations, plastic temporary shelters, agriculture assistance, cooking kits, treatment for malnourished children, and emergency medical support. Laurie's main focus was to update a database that tracks funding, activities, and the number of beneficiaries.



Participating as Fire Training Instructors

Many WFM RD&A members play an active role in training current and future fire managers. One way they do this is by teaching, coaching, mentoring, and participating on steering committees in the wildland fire curriculum.

S-590: Advanced Fire Behavior Interpretation. This two week course is taught at the National Advanced Fire and Resource Institute in Tucson, AZ in “even” years. It is targeted toward fire managers training to be Fire Behavior Analysts (FBAN) and Long Term Analysts (LTAN). The course teaches the skills needed to analyze, interpret, display, and communicate fire behavior information and its implications. Six WFM RD&A staff members participated as instructors, coaches, or steering committee members in 2012. In the 2012 class, three WFM RD&A staff members were also students.

S-520: Advanced Incident Management. This course is taught at the National Advanced Fire and Resource Institute in Tucson, AZ, targeting individuals filling national level Type 1 Incident Management Team positions such as Incident Commander, Planning Section Chief, Operations Section Chief and more. Rob Seli participated as an instructor for this course.

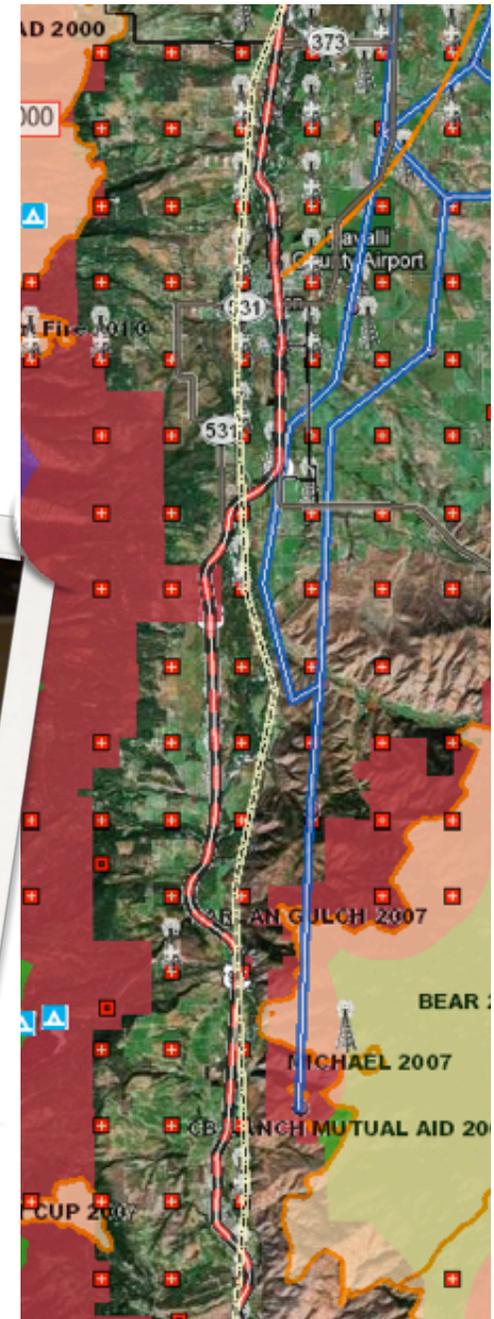
Rx-510: Advanced Fire Effects. The curriculum for this course is primarily developed for wildfire operations personnel and fire practitioners. It supports the knowledge and skills needed for Prescribed Fire Burn Boss, other Single Resource Bosses, Prescribed Fire Manager, and Strategic Operational Planner, as well as other positions that plan and implement fire management decisions. This course is taught at the National Advanced Fire and Resource Institute in Tucson, AZ. Tonja Opperman (WFM RD&A) participated as an instructor for this course.



FML: Fire Management Leadership. This course is directed to USFS Forest Supervisors and Deputy Forest Supervisors, NPS and BIA Superintendents and Deputy Superintendents, BLM Field Office and District Managers, and FWS Refuge Managers. The course provides students with a common understanding of national policy, agency administrator responsibilities and authorities, skills in fire management leadership, and skills to balance land management goals with costs and safety. This course is taught at the National Advanced Fire & Resource Institute in Tucson, AZ. Lisa Elenz participated as an instructor for this course.

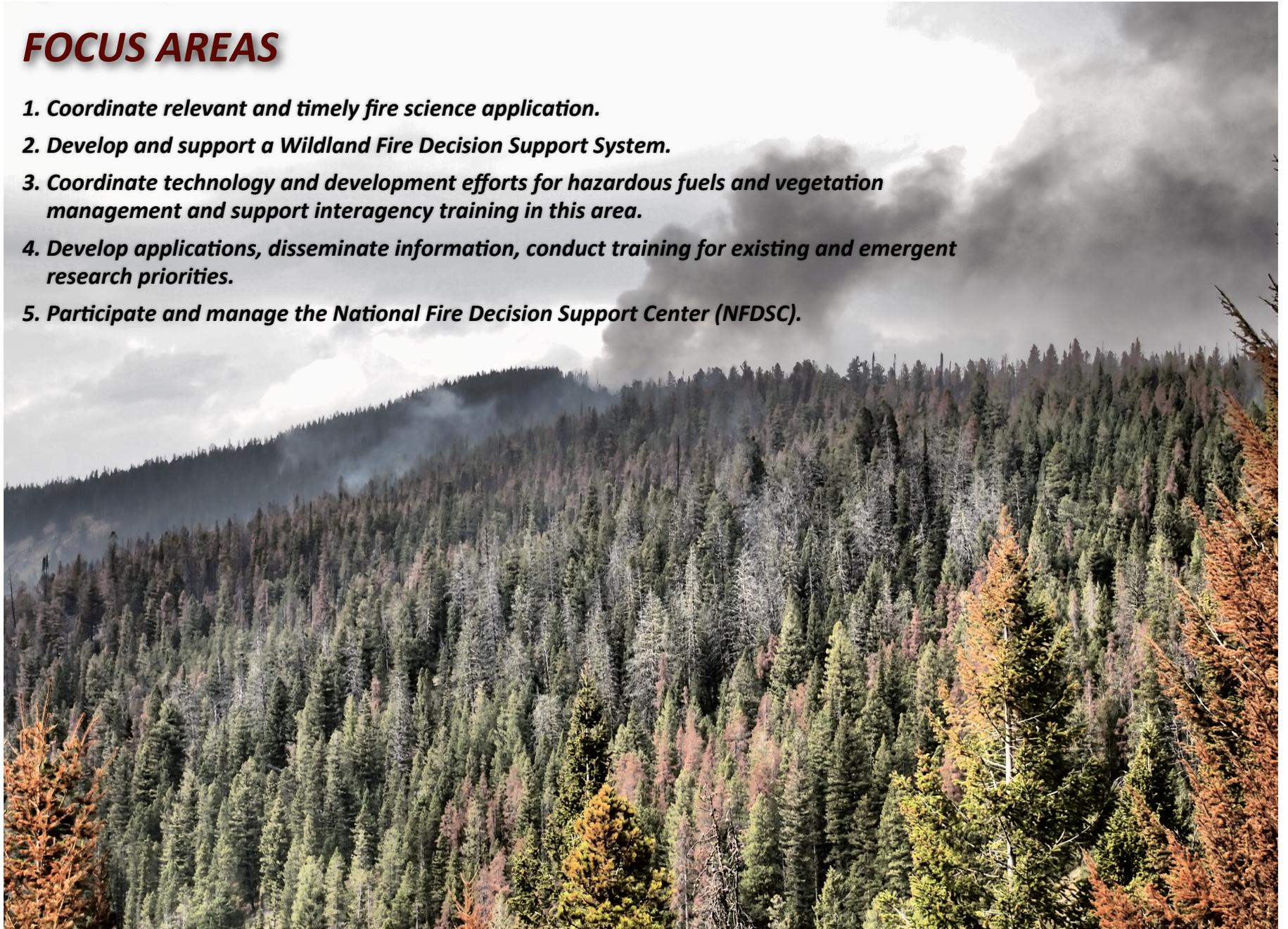
S-495: Geospatial Fire Behavior Analysis, Interpretation, and Application. S-495 is a national level course taught online through the University of Idaho with an in-residence classroom portion at the National Advanced Fire & Resource Institute in Tucson, AZ. The target audience is fire managers working toward Long Term Analyst (LTAN). In FY2012, Laurie Kurth and Tonja Opperman (WFM RD&A) participated as Steering Committee Co-Chairs to update content for the November 2012 course start date.

S-490: Advanced Fire Behavior Calculations. S-490 is a regional level course often taught at multiple regional locations each year. The target audience is fire managers working toward Fire Behavior Analyst (FBAN) and Long Term Analyst (LTAN), and other fire personnel needing skills and knowledge in fire behavior calculations. In FY2012 WFM RD&A staff participated as instructors at a regional S-490 course in the Southwest.



FOCUS AREAS

- 1. Coordinate relevant and timely fire science application.***
- 2. Develop and support a Wildland Fire Decision Support System.***
- 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 and manage the National Fire Decision Support Center (NFDSC).***



Looking Ahead: The Future of the WFM RD&A



Where We're Going in FY13 & Beyond

We have seen several areas of growth over the past year. Collaboration with the National Predictive Services group increased through the inclusion of Rocky Mountain Center's services within the WFM RD&A. Work with research scientists in the development of the USFS "dashboard" will provide new ways to capture fire activity and risk management at a larger scale. We are now able to provide diverse support to fuels management planning and implementation tools for decision making through the seamless inclusion of the NIFTT within the WFM RD&A. Our involvement in mobile technology usage and feedback mechanism testing has helped to improve user access to necessary internet-based support systems, such as WFDSS. Continued improvements in the web interface have improved the usefulness of WFDSS, while we continuing to seek out ways for units to represent fire management plans in a spatial context for improved decision-making. The smoke portal has been linked to WFDSS to improve tool availability for managers looking at fire effects, and sensitivity analysis of FSPro and Near Term fire behavior are being used to improve user outputs. Finally, detailer opportunities within the WFM RD&A are helping to expand user knowledge of WFDSS and develop experienced analysts for the field.

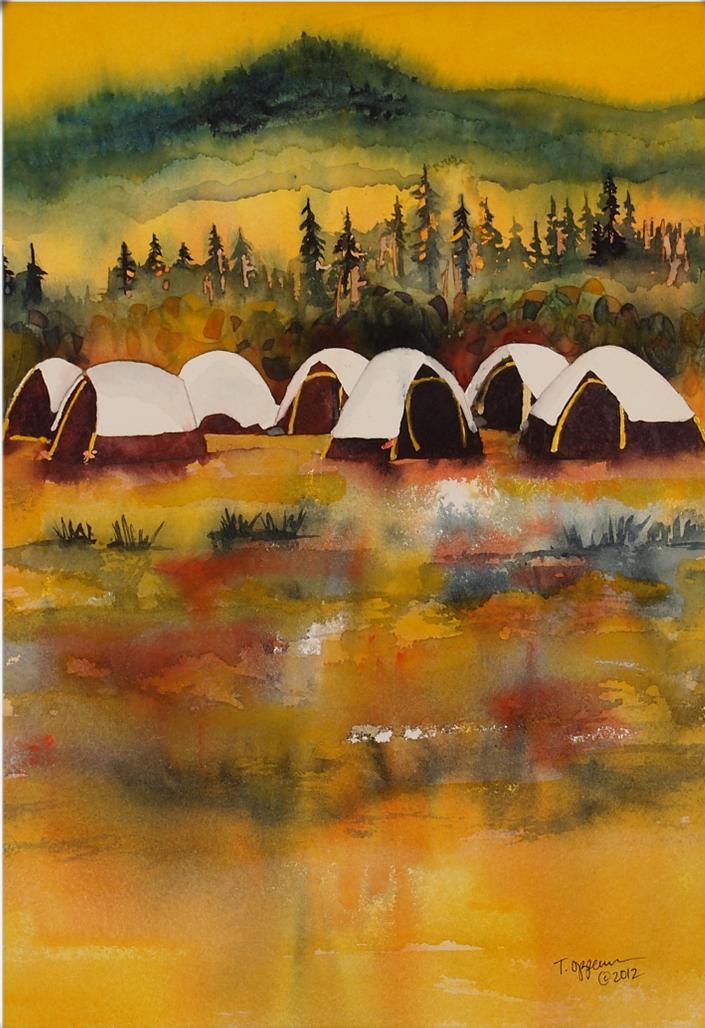
As the team moves to 2013, changes in staffing will bring new ideas and innovations to the WFM RD&A to help us deliver improved tools and decision-making assistance to the field. These changes are welcome as we look to broaden our support of the five focus areas recently chartered for the program. We are ready to handle new challenges to support wildland fire managers and staff in these areas.

We look forward to the changes 2013 will bring and the new opportunities to work with new staff and the interagency community, and will continue to strive to effectively communicate with the field, research, management, and cooperators to build a stronger relationships and a program that will support interagency fire needs.

Lisa Elenz

Deputy Program Manager





Art by Tonja Opperman, "A Welcome Rain in Fire Camp"

The Appendices offer detailed information regarding accomplishments of the WFM RD&A in the 2012 fiscal year (Appendix A), and planned activities for 2013 (Appendix B).

Appendix A. Summary of FY2012 Activities

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>
- Fire, Fuel, and Smoke Science Program, RMRS, <http://firelab.fire.org>
- Human Dimensions Program, RMRS
- Fire Program Analysis (FPA), <http://fpa.nifc.gov>
- University of Idaho Wildland Fire Science Program
- 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>
- Technical Fire Management (TFM), sponsored by the Washington Institute, <http://www.washingtoninstitute.net>
- 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

PUBLICATIONS

- Fire Use Subcommittee with assistance from Lisa Elenz and the WFM RD&A. In press. Decision-making for Wildfire Incidents: A Reference Guide for Applying the Risk Management at the Incident Level
- Opperman, Tonja. 2011. Assistance to Zambia. RMRS Explorer Newsletter, November 2011.
- Zimmerman, Tom. 2012. Zimmerman and Elenz talk WFDSS. Explorer Newsletter, January 2012.
- Kurth, Laurie. 2012. Disaster Assistance Support Program. RMRS Explorer Newsletter, January 2012.
- Zimmerman, Tom. 2012. Zimmerman on Fire Review Team. RMRS Explorer Newsletter, April 2012.
- Opperman, Tonja, 2012. Opperman called on to assist with fire monitoring in Zambia, RMRS Explorer Newsletter July 2012.
- Campbell, D., Opperman, T., Lecker, J., and Mangham, R. Kafue National Park Fire and Remote Sensing Trip Report, October 2011.
- Wildland Fire Management RD&A (main authors Parkinson, Tami and Pence, Morgan). 2012. Draft Line Officer Desk Reference for Fire Program Management (USFS). Produced by the WFM RD&A in coordination with the FS National Line Officer Team. Draft release June 1, 2012.
- Rau, Diane. 2012. WFDSS 101 lessons. <http://wfdss.usgs.gov>

PRESENTATIONS, ORAL/POSTER

- Opportunities for Change and Influence within the Framework of Wildland Fire. Interment. West Fire Ecology Conference, Snowbird, UT, Nov. 2011
- Spatial Fire Management Planning within WFDSS. Intermountain West Fire Ecology Conference, Snowbird, UT, November 2011
- WFDSS Use and Issues. National Multi-Agency Coordinating Group & Geographic Multi-Agency Coordinating Group Meeting, Boise, ID, Dec. 2011
- National Interagency Fuels Technology Transfer (NIFTT) status. National Fuels Committee meeting, Boise, ID, April 2012
- WFDSS long term weather. Russian Scientist Visit, Boise, ID, December 2011
- Draft Line Officer Desk Reference for Fire Program Management (USFS). National Line Officer Team Meeting, Virtual Presentation, March 2012
- WFM RD&A and WFDSS status update. WO FAM & R&D, Washington D.C., November 2011
- WFDSS and the National Fire Decision Support Center. National Predictive Services Subcommittee Meeting, Virtual Presentation, October 2011
- WFDSS, National Fire Decision Support Center, WFM RD&A. Pacific Northwest Fire Behavior Workshop, Vancouver WA, January 2012
- Question and Answer session. Secretary Vilsak visit, Boise, ID, July 2012
- Fire Ecology in Glacier NP, fire modeling and WFDSS. University of Montana, Crown of the Continent Course, Kalispell, MT, June 2012
- WFDSS Updates. National Park Service FMO Meeting, Virtual Presentation, June 2012
- WFDSS Landscape Editing. Northern Rockies Fire Behavior Workshop, Virtual Presentation, April 2012
- WFDSS. New Zealand and Australian Fire Managers Visit, Boise, ID, September 2012
- WFDSS. WO Executives and Staff Briefing, Washington D.C. June 2012
- WFDSS. Presentation to International Visitors, Boise, ID, February 2012
- WFM RD&A goals and mission. NIFC FS Staff, Boise, ID, July 2012.

PROJECTS BY CATEGORY

Integrate research and technology into decision support systems for better decision making

- Collaborate with the Desert Research Institute (DRI) Climate, Ecosystem, and Fire Applications (CEFA)
- Collaborate with the PNW Air Fire group
- Support FAM IT Dashboard program
- Rocky Mountain Center (RMC) Continental-Scale Evaluation and Verification of Fire-Weather Forecasts
- Integrate historical gridded weather into WFDSS, replacing WIMS
- DOI Cost Benefit Analysis Project

Assist the field to increase and improve inputs for timely risk based decisions

- Incident/Decision Support
- Risk Assessment Inventory and Tools
- Line Officer Desk Reference for Fire Program Management
- Line Officers Survey- WFDSS/Decision Support
- Maintain FBAN/LTAN/GSAN/Tech. Spec. list
- Assist Fire Use Subcommittee in writing a Decision Making GTR

Develop the following applications for fuels treatment planning:

- WFAT Tool 2.2.0 including User Guide and Tutorial
- FOFEM 6.0
- Evaluation of Fuel Loading Models (FLM) or Fuel Classification System (FCCS) fuel loads for use in estimating fire effects
- Evaluate merits of FOFEM vs. Consume
- Multi-Raster Re-class Tool
- FuelCalc 1.1 and User Guide
- LANDFIRE S-Class Mapping Tool
- FRCCmt 3.1.0
- Coordinate fuels data incorporation into the WFDSS interface
- JFSP Fuel Treatment Effectiveness Project

Incorporate fire effects into decision making

- Manage the Air resources portal linked to WFDSS to improve access to smoke modeling tools.

Evaluate, test, identify and suggest WFDSS enhancements that support the field

- WFDSS Development
- WFDSS mobile application
- WFDSS website content
- WFDSS fire behavior “playground”
- FSPro validation
- Improve NTFB analysis tool
- SQL database

Improve data delivery mechanisms for broader audiences

- Collaborate with IT Road Map planning effort
- Coordinate WFDSS Data
- Coordinate/support Cadastral Data as necessary
- Support interagency data standards
- Integrated Reporting of Wildland Fire Information (iRWin) Collaboration

Train the wildland fire community in utilization of products created/sponsored by the WFM RD&A

- Coordinate with the National Fire Offices regarding annual fire season direction
- Provide WFDSS training
- Develop a Decision Support Knowledge Base
- Support National or Geographic Area Fire Behavior (or other) Workshops
- Support National and Regional level NWCG Courses
- Coordinate the WFM RD&A Detailer Program
- Coordinate with NWCG Training

Increase awareness of the Rocky Mountain Center (RMC)

- Provide RMC Training and outreach

Support training for fuels treatment planning

- Support and identify SMEs of the NIFTT Tools
- Support FRCC and FRCCmt Workshops
- Support WFAT Workshops
- Support NWCG course delivery on NIFTT.gov
- Provide WFAT 2.2.0 online course and tutorial
- Provide FRCCmt Online Course
- Provide FRCC Online Course
- Support WIMS Course Development
- Provide “A Guide to Creating Fuel Moisture, Weather, and Wind Files”
- Support LF Total Fuel Change Tool Online Course
- Support LF Total Fuel Change Tool Case Study
- Revise the LANDFIRE Online Course
- Support the Guide to Modifying LF Data for Local Applications
- Provide Helpdesk Support for NIFTT Tools and Online Courses
- Improve the efficiency of NIFTT’s HelpDesk

Provide Assistance to Other Countries as Invitees, Participants, and Contributors

- Assist Kafue National Park, Zambia and Africa’s The Nature Conservancy in ground-truthing burn severity data from Remote Sensing Applications Center (Oct. 2011), and teach firing techniques and monitoring at workshop in Kafue (May 2012).

Integrate WFDSS, RMC, and NIFTT into the WFM RD&A

- RMC Website Coordination/Integration
- Develop mid-term and long-term objectives for RMC - Fire Consortia for Advanced Modeling and Smoke (FCAMMS)
- NIFTT Website Coordination/Integration
- Continue NIFTT Integration in WFM RD&A

Ensure employees are cognizant of current procedures and polices

- Prepare and maintain Internal Decision Support SOPs
- Prepare and maintain External Decision Support SOPs
- Prepare and maintain an Employee Handbook
- Improve Internal Communications
- Provide WFM RD&A Project Management

Communicate with collaborators to improve WFM RD&A functions

- Coordinate GA Editors Monthly Calls
- Facilitate external communications
- Utilize the WFM RD&A website
- Utilize a WFM RD&A Content Management System
- Provide points of contact for Committees/other needed representation
- Collaborate with LANDFIRE
- Coordinate/Collaborate Research and Technology
- Collaborate with Fire Science Consortia

Evaluate and modify strategic direction to incorporate known and perceived future needs

- Maintain the WFDSS strategic direction
- Maintain the WFM RD&A strategic plan

WORKSHOP AND CONFERENCE ATTENDANCE

- Intermountain West Fire Ecology Conference, Snowbird, UT
- Northern Rockies Fire Behavior Workshop, Missoula, MT
- Pacific Northwest Fire Behavior Workshop, Vancouver, WA
- Geographic Area Editor After Action Review, Virtual format
- Fire Fighter Performance Measures Workshop, Salt Lake City, UT
- Alaska FSPRO Workshop, Virtual attendance
- Payette National Forest Fire Behavior Workshop, McCall, ID
- Personality Styles in the Workplace and Time Management Workshops, Boise, ID

TRAINING COURSE INSTRUCTION

- Fire Management Leadership (FML), Tucson, AZ, March 2012
- S-590 Advanced Fire Behavior Interpretation, Tucson, AZ, March 2012
- Technical Fire Management (TFM) 26, Bothell, WA October 2012
- S-490 Advanced Wildland Fire Behavior, Tucson, AZ, February 2012
- Rx-510 Advanced Fire Effects, Tucson, AZ, February 2012
- Alaska FSPRO Workshop, Virtual, March 2012.
- Fire Effects Monitoring in Kafue National Park, Zambia, Africa, May 2012
- Payette National Forest Fire Behavior Workshop, McCall, ID, April 2012
- WFDSS YouTube Fire Behavior Videos, virtual, Spring 2012
- S-520 Advanced Incident Management, Tucson, AZ, February 2012

Appendix B. FY2013 Planned Activities (Program of Work)

FOCUS AREA 1: COORDINATE RELEVANT AND TIMELY FIRE SCIENCE APPLICATION

Continue communication, information sharing and dissemination, education, outreach and website maintenance for the WFM RD&A program and relevant partnerships. A list of partners is available at www.wfmrda.nwcg.gov

- Expand outreach opportunities to define the WFM RD&A and increase awareness.
- Support analysis and review of the Fire Danger Pocket Card evaluation by the Desert Research Institute (DRI)
- Support Alaska Interagency fire behavior webinars.
- Continue coordination with the Fire Consortia for Advanced Modeling of Meteorology and Smoke (FCAMMS).
- Increase use of the Rocky Mountain Center Products in WFDSS.
- Increase awareness and use of Rocky Mountain Center's products, including the www.fireweather.info website.
- Support an Operational System for Continental---Scale Evaluation and Verification of Fire---Weather Forecasts by the USFS Rocky Mountain Center.
- Continue coordination with the Fire Research and Management Exchange System (FRAMES), including utilization of file sharing, document, data storage, fuels websites and miscellaneous training.
- Participate as a member of the Wildland Fire Science Partnership (WFSP).
- Continue collaboration with the Pacific Northwest Research Station's Air Fire program for smoke dispersal models and seek opportunities to further integrate products for field use.
- Coordinate and cooperate with the National Predictive Services and Intelligence groups.
- Provide information as requested regarding use of LANDFIRE data and incident decisions to research partners.
- Stay abreast of the latest risk assessment processes and research. Provide feedback to the various efforts and ensure inclusion in decision support tools.
- Provide support and expertise to the development of performance measures for wildland fire management decision making and risk.
- Establish new and maintain current collaborative activities with universities, fire management groups, and other research projects to review and acquire additional decision support tools and evaluate 2013 operations. Collaborative efforts are underway with the Universities of Idaho and Montana; University of Nevada; Joint Fire Science Program; and Eastern Great Basin, Southwest, and National Interagency Coordination Center Predictive Services Units.
- Provide representative to the JFSP sponsored Northern Rockies Fire Science Network (NRFSN) Consortia.
- Support research for defining the southwest monsoons in terms of fire business being completed by the Desert Research Institute (DRI).
- Support the research to update critical fire weather patterns which is underway with the Desert Research Institute (DRI).

- Collaborate with the USFS Air Resources Management Program (USFS ARM) to perform meteorological and air quality modeling support.
- Continue work with the Geospatial Subcommittee to ensure coordination of data and standards to be used in WFDSS and other systems being developed which would include but is not limited to fire origin, ownership, unique fire identification, and fire perimeters.
- Work with IT Roadmap project management team to ensure WFDSS and other science is supported within the IT structure.

FOCUS AREA 2: DEVELOP AND SUPPORT A WILDLAND FIRE DECISION SUPPORT SYSTEM (WFDSS)

Development for FY2013 will focus on maintaining system reliability by making adjustments and improvements as funding allows. Evaluation and improvement of this system will continually take place through user feedback and will be addressed as needed.

- Improvement of map display on mobile devices.
- Evaluate new user roles to aid oversight capabilities.
- Increase risk assessment and management inputs to decisions.
- Continue to improve system help topics and content with overview information on landing pages and descriptions of available features and functions.
- Implementation of Unique Fire Identifiers for future integration into other fire management applications which will improve interoperability of systems.
- Test fire behavior analysis improvements such as ensemble Near Term analysis.
- Continue after action reviews (AARs) of WFDSS with field and Geographic Area Editors.
- Coordinate monthly GA Editors conference calls to disseminate information to field and enlist user feedback.
- Incorporate updates to national data layers and LANDFIRE data as necessary.
- Increase use of web services for data acquisition.
- Work with the Enterprise Geospatial Portal development to ensure connectivity with WFDSS prepare for future ingestion of data.
- Continue work on spatial fire management planning efforts in WFDSS to ensure coordination and implementation with the field and the Interagency Fire Planning Committee's work. Ensure common messages are distributed regarding this effort.
- Roll out spatial fire management planning effort and training in a timely manner to ensure field adoption as is feasible.
- Continue to support the migration of IBM Help Desk and provide training as necessary.
- Continue to work with FAM IT to maintain collaborative efforts with other software architectures, migration of systems, and compliance with security requirements within WFDSS.
- Work with the dispatching community to provide information for the ICS 209 to reduce redundant field entry and improve accuracy of information.
- Continue work with the IRWIN project to ensure data sharing capabilities and where feasible reduce data entry for the field.
- Consolidate wind and weather tables and provide a more detailed weather summary in the Short Term Fire Behavior model.
- Continue researching, studying and testing gridded weather products for use in the WFDSS fire behavior models.

- Incorporate maps, visual cues, logic rules and validation to assist users in creating more accurate fire locations and Unit ID's.
- Update the WindNinja software in WFDSS and provide a gridded wind option with Near Term Fire Behavior.
- Continue coordination with the Cadastral Data Subcommittee to ensure longevity of the project and ease of incorporation in to WFDSS.
- Provide critical information and expertise for the development of the "Dashboard" for national level risk management and decision information. This will include automated analysis, development of the "star chart" as an overview of fires, implementation of and early warning system for emerging fires and other analytics.
- Run automated-NTFB analysis on every fire in 2013 to improve the model outputs and input defaults.
- Test avenues to obtain computing resources such as Amazon Web Services or other.

FOCUS AREA 3: COORDINATE TECHNOLOGY AND DEVELOPMENT EFFORTS FOR HAZARDOUS FUELS AND VEGETATION MANAGEMENT AND SUPPORT INTERAGENCY TRAINING IN THIS AREA

- FY 2013 will focus on a long term plan for the WFM RD&A's involvement in fuels planning and development of fuels planning curricula and tools.
- Migrate various supported tools to Arc 10.1.
- Revise LANDFIRE Online Course.
- Update WFAT Tools 2.3.0 for ArcMap 10 which will add a report writer and incorporate FOFEM 6.0.
- Through contracting and collaboration with the Fire Modeling Institute, further develop Fuelcalc 1.1 to include a data import utility for FIREMON as well as incorporating Torching and Crowning Indices.
- Develop the LANDFIRE S-Class (Succession Class) mapping tool. This tool will aid in the mapping of the Succession Classes (SCLASS) layer of LANDFIRE data which characterizes current vegetation conditions with respect to the vegetation species composition, cover, and height ranges of successional states that occur within each biophysical setting.
- Develop FOFEM 6.0 to include the latest Fuel Characteristic and Class System (FCCS) data and upgrade to be compatible with Windows 7.
- Continue to provide FRCC instruction for the Washington Institute's Technical Fire Management Program.
- Conduct interagency workshops on FRCC and related planning tools including the Wildland Fire Assessment Tool (WFAT).
- Develop an FRCC user survey to gain understanding of user base, field needs and future development.
- Develop a methodology and training outline to guide fuels managers in the development of fuels treatments that are effective based on clearly articulated objectives.
- Complete guides for the field, including "A Guide to Creating Wind, Weather and Fuel Moisture Files" for use in Fuels Management planning and fire behavior analysis, and "Guide to Modifying LANDFIRE data for local applications".
- Produce a publication of case studies outlining the use of The Landfire Total Fuel Change Tool as it applies to landscape level fuels management planning.

- Develop an online course for the Weather Information Management System (WIMS).
- Continue partnership with the University of Idaho in developing training materials (online courses, videos, webinars, posters, etc.), developing marketing materials, monitoring the effectiveness of online courses, and providing workshop instructors.
- Develop an Introduction to Vegetation Dynamics online course for use in the Vegetation Dynamics Learning Pathway.
- Develop LANDFIRE Total Fuel Change Tool Online Course.
- Collaborate on technology transfer of LANDFIRE products with The Nature Conservancy.
- Continue providing user support with websites and a helpdesk for tools and curricula, FRCC, and LANDFIRE.
- Support the Interagency Fuels Treatment Decision -- Support System (IFT--DSS) by assisting the contractor to evaluate the system through a series of user workshops.
- Evaluate merits of tools and software programs to provide helpful information to field users—FOFEM vs CONSUME, and Fuel Loading Models vs Fuel Classification System.
- Continue to participate in the development of the Cohesive Strategy as requested.
- Coordinate with LANDFIRE as needed, (fuel Model Transition project, calibrations, user feedback, data refresh and updates).

FOCUS AREA 4: DEVELOP APPLICATIONS, DISSEMINATE INFORMATION, CONDUCT TRAINING FOR EXISTING AND EMERGENT RESEARCH PRIORITIES

- The WFM RD&A focuses on developing applications and disseminating information that will provide assistance with decision support. This is completed through training in both wildland fire decision and long term fuels planning.
- Participate in the FS CIO and Fire and Aviation Management's Mobile Technologies Integration testing phases of tablets and smart phones to improve information and applications for fire management.
- Continued development of WFDSS curriculum for NWCG and other courses and regional workshops (S495- Geospatial Fire Analysis, Interpretation, and Application, S590 – Advance Fire Behavior Interpretation, Technical Fire Management (TFM), Regional FB workshops and S490), as it relates fire behavior, decision support, and risk analysis.
- Continue to expand and revise current WFDSS online training curriculum, videos, and presentation media.
- As travel allows continue presentations at conferences, workshops, and other venues appropriate for the subject area.
- Continue FsPro and Near Term Fire Behavior Validation to provide feedback to researchers on model revisions and automation
- Provide representation and collaboration to the RMRS Science Application and Integration (SA&I) peer network.
- Support LANDFIRE Fuel Model Transition project.
- WFDSS training materials will be evaluated and improved as needed; and will include an exercise on an Introduction to WFDSS.
- Add WFM RD&A employees as cadre and steering committee members to national and regional training courses pertaining to decision support

analysis, risk assessment, and incident management. Develop and prepare materials for training delivery in FY2013.

- Work with Department of Interior Office of Wildland fire to evaluate a wildland fire cost benefit analysis.

FOCUS AREA 5: PARTICIPATE IN AND MANAGE THE NATIONAL FIRE DECISION SUPPORT CENTER (NFDSC)

- The WFM RD&A will support the field with analysis and decision support while also providing feedback to research on analytical tool use and improvements.
- Continue to expand detailer opportunities to emphasize training to field analysts and knowledge of WFDSS and the WFM RD&A
- Support interagency fire requests for fire behavior analysis and decision publication.
- Manage Geographic Area Editor conference calls to aid in information dissemination and to seek field and user input.
- Coordinate and collaborate with other NFDSC members: Fire Spread Research, Fire Economics Research, Human Factors and Risk Management RD&A, and Fire and Aviation Management.
- Conduct evaluation of 2013 fire season activities, review procedures and develop improvements as appropriate, develop 2013 accomplishments and input for annual reports.
- Maintain an FBAN/LTAN/technical specialist list for use by the NFDSC, Geographic Area Editors and Geographic areas for determining support and training opportunities.
- Continue to assist with training and refresher information for future and current analysts from IMTs, field units, GACCs, etc. through detail assignments, direct field support, and other means as appropriate.
- Evaluate field use, output, and performance of decision support analysis tools. Provide appropriate feedback to research and the field.
- Develop stronger SOPs for use of Decision Support Centers in Geographic Areas.
- Finalize the Line Officer's Reference Guide in cooperation with the Line Officer's Committee.
- Develop a survey to obtain Line Officer feedback on the decision support provided to them and their staff as well as on the WFDSS.
- Support development of the Line Officer's Guide for the Department of Interior.
- In cooperation with the Fire Use Subcommittee finalize the Decision Making for Wildfire Incidents: A Reference Guide for Applying the Risk Management Process at the Incident Level.
- Assist with development and testing of the "Dashboard", working with other NFDSC research areas.