



*Integrating  
science, technology  
and fire management.*

## **Wildland Fire Management RD&A**



12/1/2013

FY13 Annual Report

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

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## WFM RD&A PROGRAM CHARTER SUMMARY

The Wildland Fire Management Research, Development and Applications Program (WFM RD&A) serves as a primary point of contact for communication between scientists and participating field fire managers, as a liaison between research, wildland fire planning and operations, interagency wildland fire information technology groups, and as an advisor to program administrators at local, regional, and national levels. The WFM RD&A was initially chartered in 2006 and re-chartered in 2011 for a five year period. The charter is recommended by the Directors of the Rocky Mountain Research Station, Forest Management Sciences, and Fire and Aviation Management and signed by the Deputy Chief of Research and Development, the Deputy Chief of State & Private Forestry as well and the Chief of the US Forest Service. The charter defines the focus areas for the WFM RD&A. They are:

- Coordinate relevant and timely fire science applications.
- Develop and support a Wildland Fire Decision Support System (WFDSS).
- Coordinate technology and development efforts for hazardous fuels and vegetation management and support interagency training in this area.
- Develop applications, disseminate information and conduct training for existing and emergent research priorities.
- Participate in and manage the National Fire Decision Support Center (NFDSC).

## VISION

The WFM 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 and in collaboration with partners. The RD&A Program will sponsor and guide the development and application of wildland scientific knowledge; develop decision support tools; and provide science application services to the interagency wildland fire community.

## MISSION

The RD&A Program will sponsor and guide the development and application of wildland fire scientific knowledge; develop decision support tools; and provide science application services to the interagency wildland fire community. The RD&A Program will 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 agency.

## MESSAGE FROM THE PROGRAM MANAGER—TIM SEXTON



In 2013, the WFM RD&A delivered science-based decision support to the interagency wildland fire community via Decision Support Centers, remote online and telephone help, in-person analysis and interpretation, and operations and maintenance of continuously-improving web-based applications. Additionally, reference publications were released to provide administrators and managers sound advice and guidance on wildland fire policy and practices. Our emphasis has been clear—to assist decision-makers in development and application of risk-based decisions and actions that limit firefighter and public exposure while protecting values and seeking opportunities for using wildland fire to achieve land management goals and objectives.

Keeping pace with technological advances and information management remain a focus of the WFM RD&A. We work closely with the field to identify technical support needs, and with the research community to meet those needs. We will continue to 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. We will continue to improve the delivery of tools we have already developed, and we are expanding our efforts to include fuels management decision support through delivery of guidance for the fuels planning process and applications that provide local planners with a suite of tools for analyzing risk and developing mitigations to reduce risk to acceptable levels.

I am proud of the work that our skilled and dedicated team has accomplished in the last twelve months. I encourage you to read through our annual report to find out more of the details of what we have achieved and our important new projects for the future.

## FY 2013 GOALS

The RD&A has a program of work organized around three Goals. This Report highlights the objectives and accomplishments that support each of these goals:

***Goal 1: Wildland Fire Decision Support Systems are Risk-Based, Relevant, Timely, and Integrated Covering Planning (Fuels) and Incident Response.***

***Goal 2: Technology Transfer Provides Various Methods for Land Management Units to Understand Fire Risk Systems and Use them as a Basis for Project Planning and Incident Management.***

***Goal 3: Connect with Field Practitioners to Understand Management Needs; Researchers to Ensure that Latest Science is Incorporated and is Relevant to Field Needs; and Washington Offices to Ensure National Interagency Coordination in Addition to Local, State, and Non-Government Entities.***



## WELCOME AND CONGRATULATIONS

The RD&A welcomed Andrew Bailey as a Data Manager in October of 2012. His position is funded by the Department of Interior's Office of Wildland Fire and plays a key role within the interagency community.

Andrew most recently worked with the North Carolina Forest Service in Raleigh, and has worked at all levels with geospatial and biological data. He has a wealth of experience in addressing research, science and technology needs gained through his participation on numerous interagency teams and workgroups.

The RD&A congratulated Mitch Burgard in his acceptance of a lead Fire Technology Transfer Specialist position in June of 2013. He previously worked for the RD&A as a Fire Technology Transfer Specialist.

The RD&A also congratulated Ben Butler in his acceptance of a new term position in June of 2013, allowing him to continue working for the RD&A as a GIS Specialist. Ben was funded by the Bureau of Indian Affairs and National Park Service in the past, and is now funded by the Forest Service.

The RD&A hopes to welcome three new members in FY 2014 to fill vacancies from 2012 and 2013.



**FIGURE 1. ANDREW BAILEY JOINS THE RD&A**

**FIGURE 2. THE WFM RD&A, BOTTOM ROW (L-R): MARLENA HOVORKA, LETICIA SHINDELAR, TAMI PARKINSON, TIM SEXTON, TONJA OPPERMAN, MORGAN PENCE, DIANE RAU, KIM ERNSTROM. BACK ROW (L-R): NED NIKOLOV, BEN BUTLER, MITCH BURGARD, ERIN NOONAN-WRIGHT, SAM AMATO, DAN MINDAR, ANDREW BAILEY. NOT PICTURED: LISA ELENZ.**



## GOAL 1: WILDLAND FIRE DECISION SUPPORT SYSTEMS ARE RISK-BASED, RELEVANT, TIMELY, AND INTEGRATED

### 1.1 Objective: Integrate research and technology into decision support systems for better decision making

#### Incident RisC Console

The Risk Console (RisC) is a 'dashboard' concept that was designed at the request of the Washington Office as a tool for quickly assessing eight primary elements of risk on large and emerging wildland fires in real time. The online tool consolidates data from WFDSS, ICS-209 and ROSS. Additionally, RisC incorporates cutting edge research on suppression capability, aviation exposure and probability of containment that are not currently available in any other system. Users of RisC can evaluate and compare overall risk between multiple incidents and further drill down into an individual incident to look at more detailed and specific metrics. RisC will be available to authorized users as an extension of the Enterprise Geospatial Portal (EGP) in 2014. To assist with building the 2013 prototype the WFM RD&A collaborated with WO-FAM, Forest Service Research (Economics and Fire Spread), and FAM-IT.

FIGURE 3. A SCREEN CAPTURE FROM THE INCIDENT RISK CONSOLE (RISC) SHOWS A SUMMARY OF ELEMENT RATINGS FOR THE 2013 BUTLER FIRE.



## Technology Provides an Edge in Fighting Fires

The RD&A Program Manager was interviewed for a July 9th article in The New York Times regarding use of mobile devices for getting real-time fire information to firefighters on the ground. However, burning forests often have no cellphone towers. **“The real big stumbling block we’ve got right now that we’ve got to solve is how to get Internet connectivity to every fire, every time.”** The article went on to highlight better methods of collecting data with technology, such as GPS receivers, unpiloted aircraft with infrared sensors and ad hoc computer networks to allow firefighters to share information. As the Program Manager explained, “We could remotely look at the locations of firefighters in relationship to where the fire is....Sometimes it comes over a ridge, and the crews can’t see it coming.” See the complete article here:

<http://www.nytimes.com/2013/07/09/science/getting-an-edge-on-wildfires.html>

## 1.2 Objective: Assist the field to increase and improve inputs for timely risk based decisions

### Risk Assessment Inventory and Tools

The RD&A worked to increase the fields’ use of risk assessment tools through multiple efforts. The document, USFS Fire Response Protocol’s 7 Standards for Managing Incident Risk & Wildland Fire Decision Support System was written by the RD&A to addresses how the Standards for Managing Incident Risk is supported by WFDSS—available at [www.wfmrda.nwcg.gov](http://www.wfmrda.nwcg.gov). WFDSS Help documentation now includes more information about how to evaluate risk. Briefing materials were provided to the FS Washington Office about WFDSS updates that support incident risk assessments.

**FIGURE 4. A CROSS-WALK OF KNOWN RISK MANAGEMENT MODELS, TAKEN FROM “USFS FIRE RESPONSE PROTOCOL’S 7 STANDARDS FOR MANAGING INCIDENT RISK AND WILDLAND FIRE DECISION SUPPORT SYSTEM (WFDSS)”, 2013.**

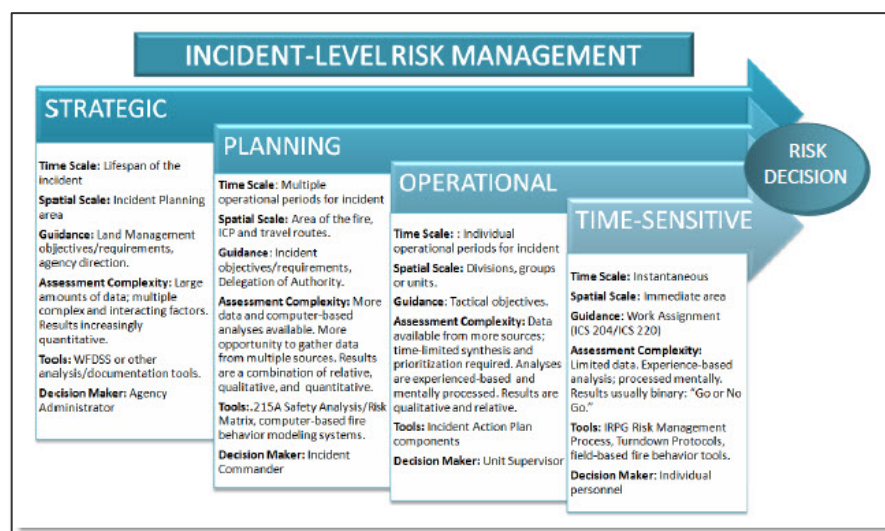
Risk Management Cycle	1 - Situational Awareness	2 - Assessment	3 - Risk Control	4 - Decision	5 - Implementation	6 - Evaluation
Deliberative Risk Informed Decision Model	1 - Problem Formulation	3 – Analysis	5 - Affirmation of Analysis Results	6 - Application-Decision Implementation		
	2 - Information Gathering	4 - Synthesis		7 - Archival Documentation		
Structured Decision Model	1-Frame the Position	2 – Problem Analysis		3 – Decision Point	4 – Implementation & Monitoring	
WFDSS	Information tab	Situation tab	Objectives tab	Validation tab	Objectives tab	Periodic Assessment
	Situation tab	Objectives tab	Course of Action tab	Decision tab	Course of Action tab	
		Relative Risk Assessment			Management Action Points	
USFS Wildland Fire Response Protocol, 7 Standards for Managing Incident Risk		1 – Incident Risk Assessment	2 – Risk Analysis	5 – Risk Informed Decision		7 Monitor & Adjust
	3 – Two Way Communication					
	4 – Risk Sharing Dialogue					
	6 – Document the risk					



Tools	Basic Fire Behavior (BFB)	FlamMap* or Short-Term Fire Behavior (STFB)	FARSITE* or Near-Term Fire Behavior (NTFB)	Fire Spread Probability (FSPro)
Type of Tool	Spatial, only in WFDSS	Spatial, desktop and WFDSS	Spatial, desktop and WFDSS	Spatial, only in WFDSS
General Time Frames	For current burn period	For Next 1-3 Days	For Next 1-7 Days	For 7-30 Days in Future
Fire Behavior Questions	Basic Fire Behavior (BFB)	FlamMap* or Short-Term Fire Behavior (STFB)	FARSITE* or Near-Term Fire Behavior (NTFB)	Fire Spread Probability (FSPro)
How and where will the fire spread with the forecast weather?		Using unchanging weather, wind and fuel moistures provides map of fire spread over next 1-3 days. Identifies fastest fire travel routes.	Using variable (e.g. hourly, diurnal) weather, and fuel moisture, provides a map of fire spread over the next 1-7 days.	
What fire behavior (e.g. flame length, rates of spread, spotting) is expected with known weather and fuel conditions?	Using static weather/wind input and varying fuel models/terrain, provides fire behavior outputs within a "box" drawn around the fire area.	Using static weather/wind input and varying fuel models/terrain, provides output of fire behavior for a "box" around the fire; fire size, and time of arrival also given.	Using variable weather/wind inputs and varying fuel models/terrain, provides output of fire behavior, fire size, and time of arrival. Used with next 1-7 days of forecast weather.	
If a fire reaches a point of concern, what fire behavior can I expect at that location?	Fire behavior outputs are available within a "box" drawn around the point of concern; uses static weather scenario.	Fire Behavior outputs and fastest fire travel routes are available for a "box" around the fire; uses one static weather scenario.	Mapped Fire Behavior outputs are only available if the modeled fire actually reaches the point of concern, if so it is for the weather conditions modeled when the fire reaches that point	
What is the probability the fire may reach a point of concern in the next 1-7 days? In 8 or more days?				Uses forecast weather and climatological probabilities for a probabilistic fire spread output. Outputs best used after calibrating the landscape and tool.
There is a major wind event in the forecast—how far might the fire travel? What is the		A single windspeed and direction (static or gridded) input can show fire growth and behavior	Multiple windspeeds and directions per day can show fire growth and behavior in	

**FIGURE 5. THE LINE OFFICER GUIDE HAS MANY REFERENCES, INCLUDING THIS TABLE OF THE FIRE BEHAVIOR TOOLS USED TO INFORM FIRE DECISIONS.**

six element risk management cycle designed to encourage sound risk-informed decision making in accordance with Federal wildland fire policy, although the process is equally applicable to non-Federal fire managers and partners. The process describes the assessment and control of identified risks, the analysis of benefits and costs, and the risk decision at multiple scales. Decision makers can apply principles from this publication to specific decision documentation structures such as WFDSS or other wildland fire decision documentation systems.



**FIGURE 6. THE "DECISION MAKING FOR WILDFIRES" DOCUMENT CAN BE FOUND AT [WWW.FS.FED.US/RM/PUBS/RMRS\\_GTR298.HTML](http://WWW.FS.FED.US/RM/PUBS/RMRS_GTR298.HTML). (RMRS-GTR-298WWW).**

## Line Officer Guide

The RD&A completed the 2013 edition of the Line Officer Desk Reference for Fire Program Management, in coordination with the Forest Service National Line Officer Team. The document assists line officers with fire management, including sections on pre-season preparedness, incident management and oversight, post fire, and fuels management. The publication compiles existing information, such as directives, policy and guides into one source, available at [www.wfmrda.nwcg.gov](http://www.wfmrda.nwcg.gov).

## Assist Fire Use Sub-committee in writing a Decision Making GTR

Decision Making for Wildfires: A Guide for Applying a Risk Management Process at the Incident Level. This publication focuses on the thought processes and considerations surrounding a risk management process for decision making on wildfires. The publication introduces a

### Decision Support for Special Projects

Staff members supported the Yarnell Hill Fire Investigation team, developing fire perimeters and fire behavior information for July 30<sup>th</sup> since it was not available due to the rapidly changing fire environment. This reconstruction was completed using Moderate Resolution Imaging Spectroradiometer (MODIS), Short Term Fire Behavior modeling, digital photographs, and Wind Wizard outputs. The progression map helped the investigation team determine the fire location and fire behavior at many critical points during the incident. This information was provided in various KMZ files for Google Earth that supported the investigation and can be used in teaching scenarios.

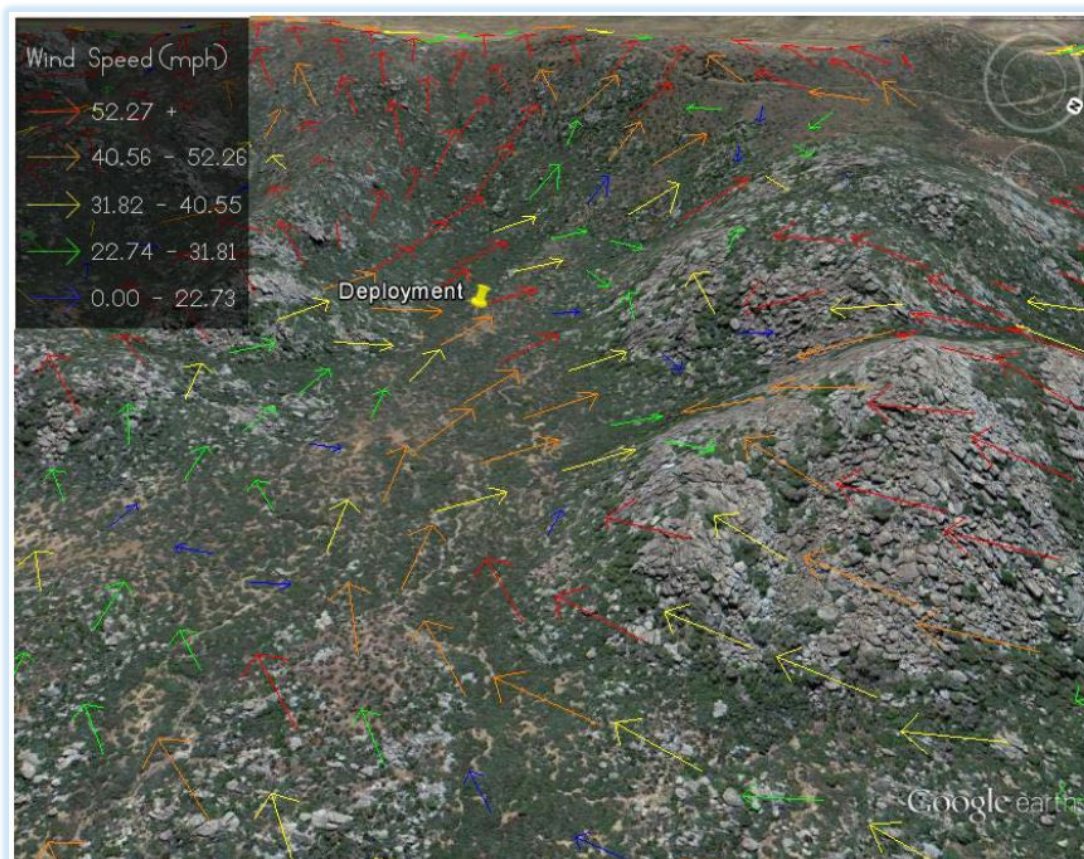
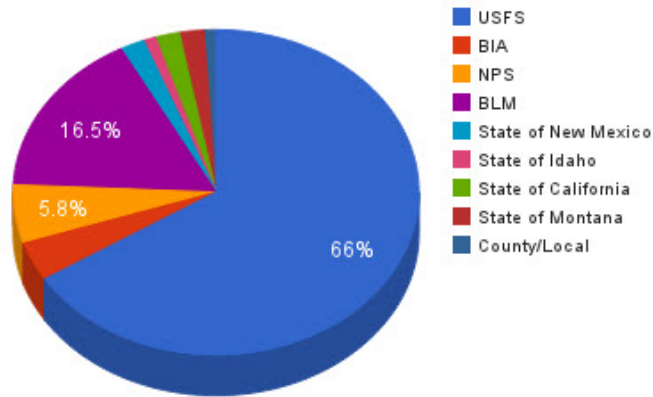


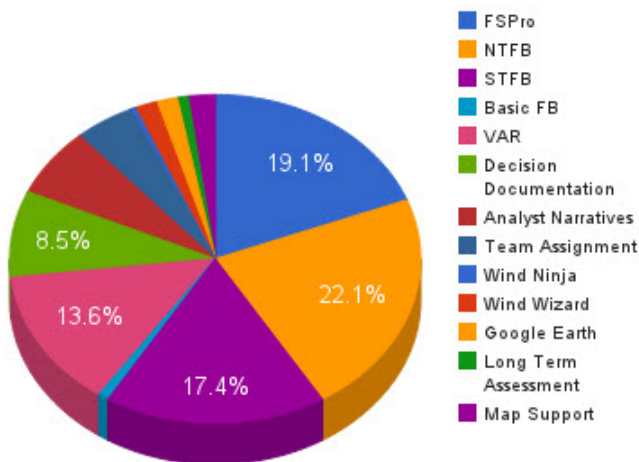
FIGURE 7. THE WIND WIZARD MODELING SOFTWARE WAS USED TO RE-CREATE WIND SPEEDS AND DIRECTIONS ON THE YARNELL FIRE.



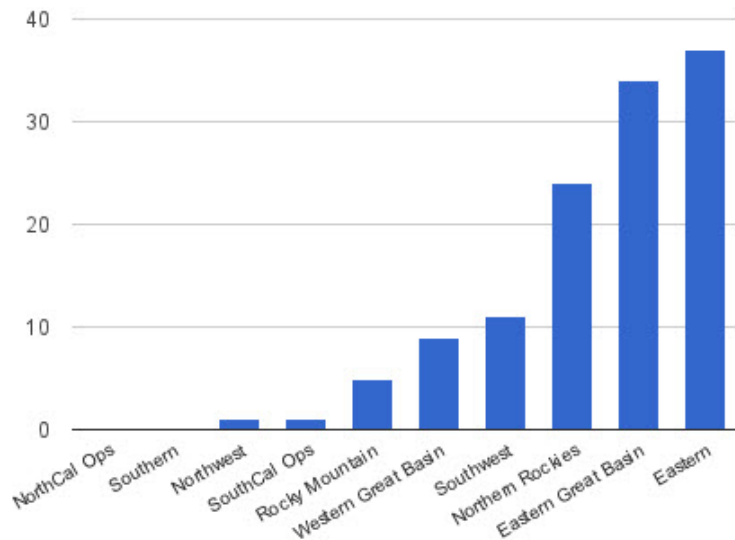
**FIGURE 8. WE PROVIDE DECISION SUPPORT TO ALL AGENCIES, WITH THE MAJORITY TO USFS AND BLM.**

### Provide Timely Decision Support Analyses

We supported 86 incidents in eight geographic areas and staffed one Decision Support Center in the Eastern Great Basin in FY13. Most of our support is to the USFS and BLM. Virtual and on-scene support included fire behavior, decision documentation, and analysis narratives. The RD&A provides daily support to the field through formal and informal means, 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. The total number of formal support tickets for FY13 was 2,342.



**FIGURE 9. MOST OF THE SUPPORT WE PROVIDE IS FIRE BEHAVIOR MODELING--FSPRO, NEAR TERM AND SHORT TERM MODELING. WE ALSO ASSIST WITH VALUES AT RISK (VAR) ASSESSMENT.**

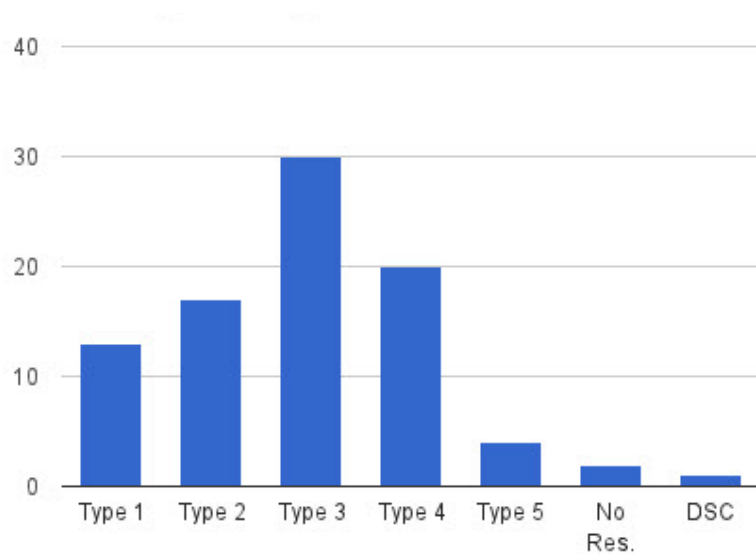


**FIGURE 10. IN FY13, MUCH OF OUR SUPPORT WAS TO THE EASTERN, EASTERN GREAT BASIN, AND NORTHERN ROCKIES GEOGRAPHIC AREAS.**

Formal means for providing Help and Technical Assistance to users include:

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

Informal support includes personal communications with individuals outside of formal methods. The Monthly Informal Support Tally chart shows the informal support provided by month in FY13, with an annual total of 561.



**FIGURE 11. THE DECISION SUPPORT CENTER TENDS TO HELP TYPE 3 INCIDENTS THE MOST. OCCASIONALLY WE ASSIST FIRES WITH NO RESOURCES OR THROUGH A FORMAL DECISION SUPPORT CENTER.**



## GOAL 2: TECHNOLOGY TRANSFER PROVIDES LAND MANAGEMENT UNITS WITH AN UNDERSTANDING OF FIRE RISK SYSTEMS AND THEIR USES

### 2.1 Objective: Train the wildland fire community in utilization of the products that we create or sponsor.

#### Support National or Geographic Area Fire Behavior Workshops

One objective of the WFM RD&A is to train the wildland fire community in utilizing the products we sponsor. This includes workshops and courses. The RD&A continually supports fire behavior training within the wildland fire community. This year RD&A staff supported national and geographic area Fire Behavior Workshops, by coordinating, presenting and participating as subject matter experts in these workshops. The workshops build basic and advanced skills in geospatial fire analysis at the local unit level and above. These skills are critically needed for risk informed decision making on wildland fires. These workshops included the International Association of Wildland Fire (IAWF) Fire and Fuels Conference, Regions 1 and 2 Fire Behavior Workshops, and the Alaska Fire Behavior Workshop.



FIGURE 12. S-495 STUDENTS IN BOTH MISSOULA AND TUCSON WERE TAUGHT SIMULTANEOUSLY, COMMUNICATING THROUGH VIDEO TELECONFERENCE AND GO-TO-MEETING.

#### National and Regional Level Courses

The RD&A supported several National and Regional courses. In FY13 our staff led Steering Committees, developed training materials, taught lessons or gave presentations at Fire Management Leadership, S-400: Incident Commander, S-520: Advanced Incident Management, S-482: Advanced Fire Management Applications, RX-510: Advanced Fire Effects, and S-495: Geospatial Fire Analysis, Interpretation, and Application.

S-495 Geospatial Fire Analysis, Interpretation, and Application began with online distance learning for 60 students in November 2012 and culminated in a hands-on classroom session in April 2013 that was co-taught from the National Advanced Fire Resource Institute in Tucson and the Region 1 Training Center in Missoula. Based on a poll, **the virtual classroom saved Missoula students and faculty approximately \$29,500 in travel costs**. Students who desire a Geospatial Analyst and/or Long-Term Fire Analyst qualification for fire incident management take the intensive course. Five RD&A staff members participate with this course as coaches, mentors, instructors, and steering committee chairs.

The RD&A staff evaluated the online content of the S-491: Intermediate National Fire Danger Rating System, the Weather Information Management System (WIMS), and Fire Family Plus courses. On-line course material will be used as an alternative to classroom instruction and/or will be used as pre-course work to reduce required classroom time. The RD&A also ensured online content was uploaded and available at NIFTT.gov for S-244: Field Observer.

### **Detailer and Mentee Program**

The RD&A provided training opportunities to six mentees this fire season. The RD&A's Mentee program provides field practitioners an opportunity to improve their analysis skills and work with the RD&A on on-going projects. Each mentee worked in 2 week increments from June 17<sup>th</sup> through September 7. Mentees were coached as needed by staff while supporting incidents. In total mentees supported 24 different incidents in 7 geographic areas with fire behavior analysis. While typically these assignments are completed virtually, one mentee had the opportunity to travel to Boise, ID to staff a Decision Support Center and support a Multi-Agency Coordination Group (MAC) in August. While not supporting incidents mentees tested a new release of WFDSS, critiqued WFDSS training videos, provided review of the USFS Line Officer Desk Reference for Fire Program Management, aided the development of a spatial briefing product prototype, and identified incidents to assist with fire behavior model validation.

The RD&A utilized four detailers in FY2013. Two detailers assisted the RD&A with analysis and training support. These detailers functioned as members of the RD&A staff, completing their detail virtually from their home duty station and traveling to support fire incidents as needed. They assisted the RD&A by providing decision and fire behavior analysis support to incidents utilizing WFDSS. They also worked on a number of current on-going projects with RD&A staff. Two other detailers assisted the RD&A in accomplishing fuels work. RD&A detailers assisted with Fire Regime Condition Class (FRCC) and LANDFIRE related projects. This included consolidating and re-working the helpdesk database, testing and reviewing beta versions of online training materials, developing training modules for S-390/RX-341, aiding a fuels treatment effectiveness project, and researching various planning efforts. Detailers also laid initial groundwork for a Fuels Resource Portal website.



**FIGURE 13. THE RD&A'S DIANE RAU GIVES A BRIEFING ON THE FSPRO OUTPUT FOR THE JAROSO FIRE IN NEW MEXICO.**

GOAL 3: CONNECT WITH FIELD PRACTITIONERS TO UNDERSTAND MANAGEMENT NEEDS; RESEARCHERS TO ENSURE RELEVANCY TO FIELD NEEDS; AND WASHINGTON OFFICES TO ENSURE NATIONAL INTERAGENCY COORDINATION

### 3.1 Objective: Communications with collaborators improve WFM RD&A functions

#### Supporting Interagency Spatial Fire Management Planning

RD&A staff worked with the Interagency Fire Planning Committee and the Forest Service National Office to test and support field units who have a need and desire to spatially describe their strategic objectives and management requirements. As fire planning continues to evolve, agencies are looking to move away from static plans that are hundreds of pages long. Several Department of Interior agencies are testing Spatial Fire Management Plans (SFMP), along with several forests.

**“[Spatial Fire Management Planning in WFDSS is a] very nice way to ...articulate a Forest Plan. No need to grab the Forest Plan and go surfing anymore whistling ‘now what does the forest plan say again?’ It is all right there at your fingertips. And feedback from the Line Officer was positive as well. In short, I like it.”**

**--Mike Goicoechea, Forest Fire Management Officer, Beaverhead-Deerlodge NF, Montana**

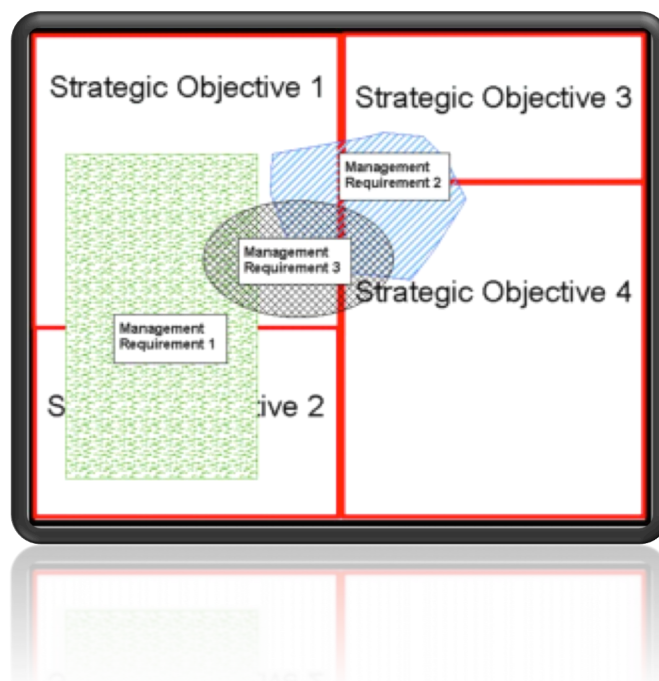


FIGURE 14. THE SPATIAL FIRE PLANNING PROCESS MAKES IT EASIER TO SEE WHERE MANAGEMENT CONSTRAINTS ARE LOCATED IN THE CONTEXT OF STRATEGIC FIRE DIRECTION FOR A LOCAL UNIT.

## Establishing Communications with Research Stations

The RD&A is interested in expanding its collaboration beyond the Rocky Mountain Research Station. This year the RD&A Program Director sent out a formal email to many of the other Forest Service Research Stations as well as the Western Wildland Environmental Threat Assessment center, soliciting interest in collaborating on projects that may fit into one of our program areas. These letters opened dialog with many researchers and research managers. The RD&A is always looking for new and innovative tools or aids that will assist field units with decision support or risk assessment in either wildland fire or fuels.

## Review of the Fire Danger Pocket Card

The RD&A supported analysis and review of the Fire Danger Pocket Card evaluation by the Desert Research Institute (DRI) Climate, Ecosystem, and Fire Applications (CEFA). This tool communicates key index values from the National Fire Danger Rating System to provide greater awareness of fire danger and increased firefighter safety. The Pocket Card provides a description of seasonal changes in fire danger in a local area. It is useful to both local and out-of-area firefighters. It was noted during the 2011 fire season that 1) for some units the pocket cards were not updated annually, and 2) that many fire personnel were not using the cards. This project quantitatively examined how critical it is to update Pocket Cards annually from the data information perspective, and assessed operational use and acceptability of the cards through several questions that were asked via an interview process with firefighters. The results may help facilitate consistent and enhanced use of fire danger information to support management decisions made by wildland fire agencies, effect on the ground activities in fire preparedness, wildfire suppression and management, and improve firefighter safety. This project is a collaborative effort between the RD&A and the NWCG Fire Danger and Fire Behavior Subcommittees, and DRI.

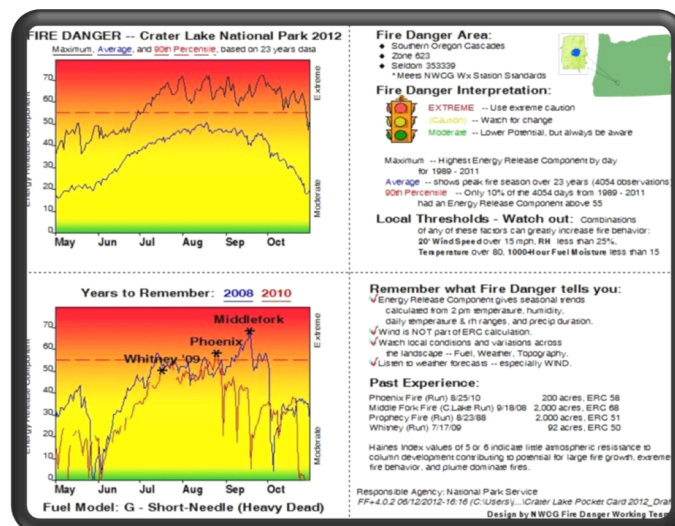


FIGURE 15. THE FIRE DANGER POCKET CARD IS A ONE-PAGE SUMMARY OF AN AREA'S FIRE DANGER THAT IS USED TO INFORM FIREFIGHTERS ABOUT LOCAL CONDITIONS.



## Fire Science Consortia Support

The RD&A is an advisory member of the Northern Rockies Fire Science Network (NRFSN), which is one of 14 consortia across the United States (see <http://nrfirescience.org/> for more information).

The board provides advice on the direction and focus of the NRFSN activities pertinent to the Northern Rockies geographic area. The RD&A provides a management perspective for this consortium that is strongly influenced by the research community. In 2013, the NRFSN sponsored and provided leadership and logistical support to a White bark Pine and Traditional Knowledge and Fire workshops, Integrated Fuel Treatments field trip for managers, and hosted a number of webinars discussing all aspects of fire management.

## Geographic Area Editors Communication and Coordination

The RD&A continues to coordinate monthly with the Geographic Area Editors (GAEs) who represent the interagency fire community. Their role is invaluable in providing feedback and guidance to the RD&A and distributing information and training to the field. Typical calls not only allow the RD&A to present current issues, new developments, and solicit feedback for WFDSS and other related topics but allow for the GAEs to share information, progress, and incident needs amongst themselves. Annually an After Action Review is coordinated to summarize priority tasks for the year for both the WFM RD&A and the GAEs. These tasks support the field users, new development, and remedy identified issues.

## Customer Surveys

The RD&A staff solicited feedback from two user groups in 2013 to aid efforts in improving tools, training, and outreach to these groups. A **Training Survey** was developed to gain information regarding the training media used and to assist the staff with future development and training materials. The survey was posted at: [https://wfdss.usgs.gov/wfdss/WFDSS\\_Training.shtml](https://wfdss.usgs.gov/wfdss/WFDSS_Training.shtml).

Additionally, the link was shared with the geographical editors to pass on to field personnel. The RD&A received comments from Data Managers, Fire Behavior Specialists and Geographic Area Editors. The information obtained from the survey will assist the RD&A with future training and development opportunities.

An **Agency Administrator Survey** gathered information from an Agency Administrator's



**FIGURE 16. DAVE CAMPBELL, WEST FORK DISTRICT RANGER ON THE BITTERROOT NF IN MONTANA, HAS MANAGED WILDERNESS FIRES FOR 17 YEARS. HERE, HE INSPECTS LINE THAT WAS CONSTRUCTED TO PROTECT INFRASTRUCTURE OUTSIDE OF WILDERNESS WHERE THE GOLD PAN FIRE BURNED IN 2013.**

perspective regarding their uses of WFDSS, what is/isn't working, familiarity of RD&A's NFDSC, WFDSS Lite, training participation, and suggestions to make WFDSS better for this specific user community. The survey was sent out through the FS National Line Officer Team, and the National Fire Directors, and was shared through agency specific mailing lists.

Information gathered from the survey helped develop some of the contractual task orders for 2014, to make the system more usable and

applicable for agency administrators.

Feedback will help drive new training materials or modules for future implementation.

## Collaborate and Support LANDFIRE

RD&A staff continue to provide support and collaborate with the LANDFIRE program, providing management of the LANDFIRE Help Desk and the GIS and Data Management tools located at [www.nifft.gov](http://www.nifft.gov). The LANDFIRE Help Desk is staffed by University of Idaho personnel fielding user questions and locating subject matter experts as needed. Staff are working to revise management of the Help Desk to allow users to search a knowledge base and participate in user forums and discussion boards. This effort is being managed by The Nature Conservancy with support from the staff at the University of Idaho. A Beta knowledge base and discussion forum was constructed and is currently being tested.

## LANDFIRE Online Course Development

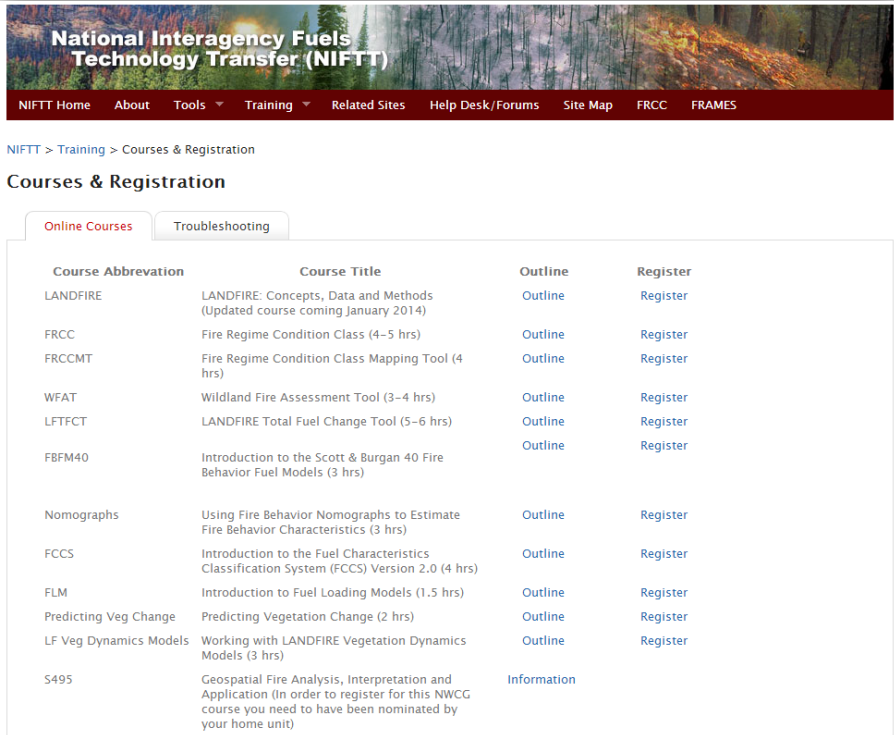
The UI staff managed by the RD&A developed and updated LANDFIRE courses to reflect the 2010 LANDFIRE data release. The online course is designed for individuals with knowledge and skills with LANDFIRE data that range from considerable to none. Modules include “Accessing Data, Versions, and User Guidance, BPS Models, Existing Vegetation Layers, Ecological Systems and NVCS Exercise, existing Vegetation Methods, Reference Data Base, and Topographic Layers.

## Analysis of DOI Fire Program Effectiveness

The Department of Interior, Office of Wildland Fire (DOI-OWF) has engaged the RD&A to assist with an analysis of the agency’s wildland fire costs. Working with OWF staff and economists, the RD&A provided fire behavior modeling output (Fire Spread Probability and Near-term Fire

Behavior) to help answer the questions, “What values would have been impacted, how much money would have been spent and where would this fire have spread if it hadn’t been put out?”

Analysis and supplementary data was collected for approximately 30 fires. This has been an ongoing project initiated in 2012 with continued support provided to DOI OWF until a fire report is produced.



**National Interagency Fuels Technology Transfer (NIFTT)**

NIFTT Home About Tools Training Related Sites Help Desk/Forums Site Map FRCC FRAMES

NIFTT > Training > Courses & Registration

**Courses & Registration**

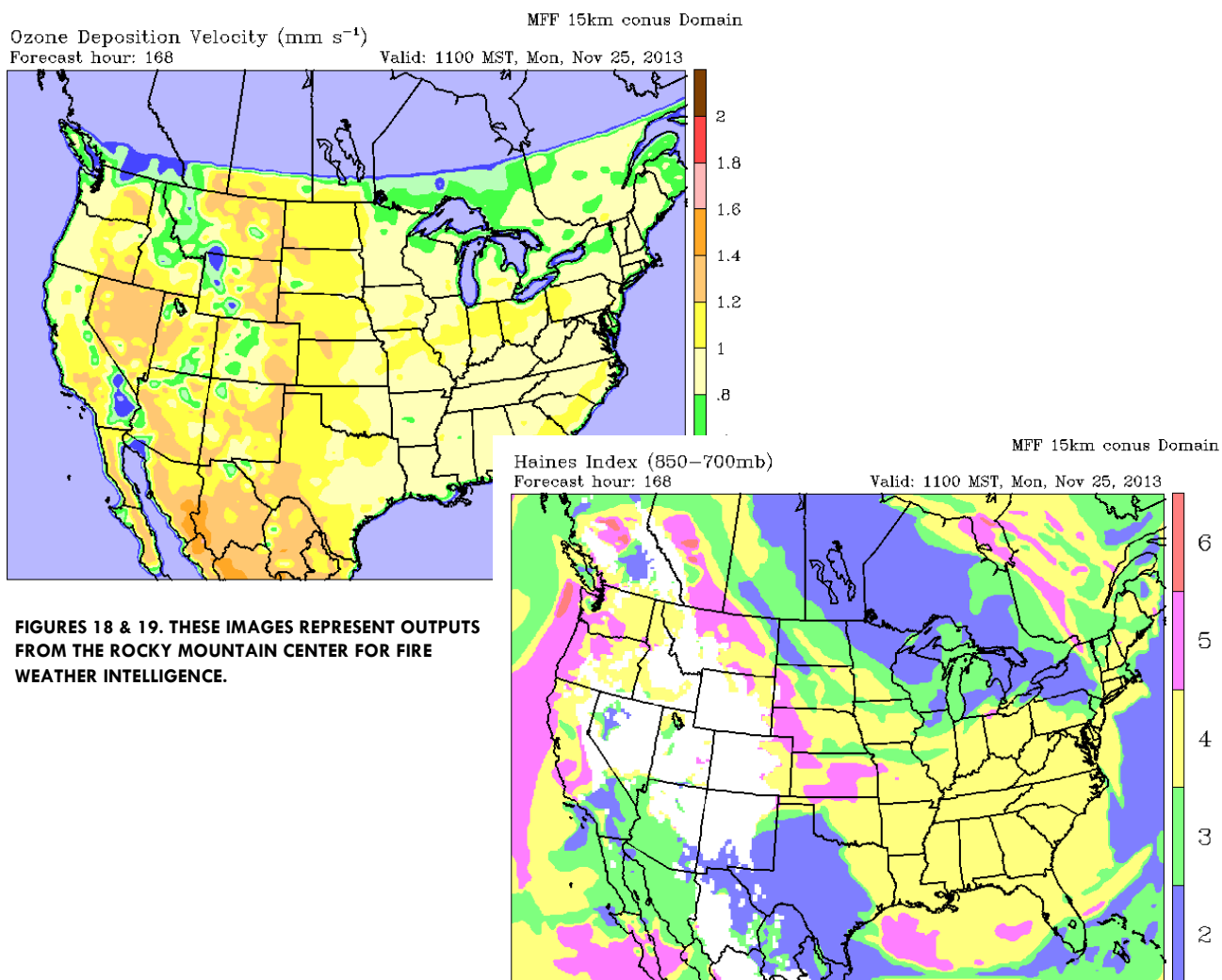
Online Courses Troubleshooting

Course Abbreviation	Course Title	Outline	Register
LANDFIRE	LANDFIRE: Concepts, Data and Methods (Updated course coming January 2014)	<a href="#">Outline</a>	<a href="#">Register</a>
FRCC	Fire Regime Condition Class (4–5 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
FRCCMT	Fire Regime Condition Class Mapping Tool (4 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
WFAT	Wildland Fire Assessment Tool (3–4 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
LFTFCT	LANDFIRE Total Fuel Change Tool (5–6 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
FBFM40	Introduction to the Scott & Burgan 40 Fire Behavior Fuel Models (3 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
Nomographs	Using Fire Behavior Nomographs to Estimate Fire Behavior Characteristics (3 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
FCCS	Introduction to the Fuel Characteristics Classification System (FCCS) Version 2.0 (4 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
FLM	Introduction to Fuel Loading Models (1.5 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
Predicting Veg Change	Predicting Vegetation Change (2 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
LF Veg Dynamics Models	Working with LANDFIRE Vegetation Dynamics Models (3 hrs)	<a href="#">Outline</a>	<a href="#">Register</a>
S495	Geospatial Fire Analysis, Interpretation and Application (In order to register for this NWCG course you need to have been nominated by your home unit)	<a href="#">Information</a>	

**FIGURE 17. THE NIFTT WEBSITE IS MANAGED BY THE RD&A AND HOSTS ONLINE TRAINING COURSES RELATED TO FUELS AND FIRE BEHAVIOR.**

## High-Tech Collaboration to Analyze Weather and Air Quality Data

The Rocky Mountain Center (RMC) for Fire-Weather Intelligence ([www.fireweather.info](http://www.fireweather.info)), a unit of the RD&A, has joined forces with the WO Division of Wildlife, Fish, Water, Air and Rare Plants (WFWARP) in a unique long-term partnership that involves complex analysis of weather & air quality data using Forest Service supercomputers. RMC signed a formal agreement to collaborate on atmospheric modeling projects aimed to enhance the understanding of impacts by smoke, fire, and climate on air quality and ecosystem health. Areas of mutual interest include downscaling of forecast and observed meteorological fields to improve real-time fire behavior simulations and smoke dispersion, effect of smoke emissions on tropospheric ozone and visibility, and impact of future climatic changes on regional fire potential and air quality. The new partnership was kicked off with the purchase of a new supercomputer that was successfully integrated into the RMC existing infrastructure. RMC provided logistical assistance to a litigation effort that required an air quality assessment based on 3D simulations of weather, atmospheric chemistry, and pollution transport. The effort finished successfully with the delivery of a comprehensive air pollution transport assessment.





## External communications

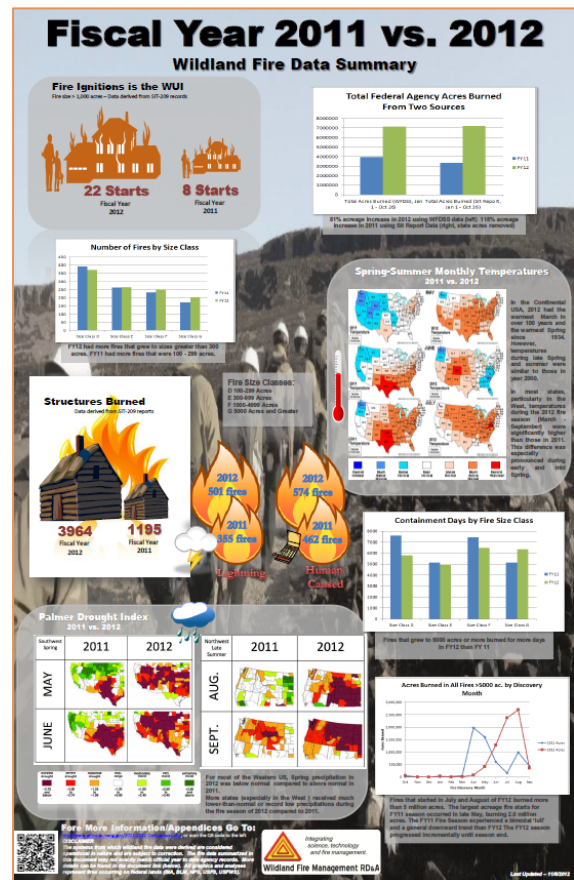
Wildland fire expenditures increased in Fiscal Year 2012 as compared to the prior year. At the request of the Washington Office, the RD&A gathered weather and fire to determine to what extent environmental factors may have contributed to the cost difference. Climate, weather, fire danger, distance to communities, wildland fire acreage, duration and additional factors were examined. A wide variety of data sources were utilized; WFDSS proved to be particularly valuable for obtaining accurate federal wildland fire statistics on a national scale. Human behavior and decision making were not analyzed but results showed that the 2012 fire season saw significantly more burned acres, greater impacts to the urban interface and weather conditions that were hotter and drier than the 2011 season. In lieu of a white paper, the results were distributed to the Washington Office through a web page that contained an illustrative infographic and links to a graphical presentation and further documentation. Learn more at:

[http://www.wfmrda.nwcg.gov/docs/FireSeasonComparison\\_infographic.pdf](http://www.wfmrda.nwcg.gov/docs/FireSeasonComparison_infographic.pdf)

Some RD&A staff attended the Association for Fire Ecology's 5th International Fire Ecology and Management Congress December 3-7th, 2012 in Portland, Oregon. The RD&A's presence at the conference included a staffed booth to explain our services. We hosted workshops related to the National Interagency Fuels Technology Transfer (NIFTT) Program; displayed posters and gave several formal presentations, including one regarding insights on ten years of advancement in research collaboration and decision support systems. The conference was an excellent opportunity to share the accomplishments and abilities of the RD&A and gave all in attendance an opportunity to interact with both the scientific and management communities. Attendance ensured both a strong connection to the field and allowed for in-person collaboration.

RD&A staff attended 4th Fire and Fuels Conference  
February 18-22nd, 2013 in Raleigh, North Carolina.

Staff served on the conference program committee to develop a wide-ranging agenda. An RD&A booth was staffed which provided opportunities to interact with participants and provide information about the group's role in coordinating and fostering science application in wildland fire. Attendees used a touch-screen display to feature various aspects of the RD&A. Staff coordinated a workshop on advanced fire and moderated a plenary session where the RD&A's P fire environment. The conference provided a great opportunity for scientists in the wildland fire community, and raise awareness for research, fire managers and decision makers.



**FIGURE 19. THIS INFOGRAPHIC WAS PREPARED BY THE RD&A TO COMMUNICATE DIFFERENCES IN FIRE SEASON COSTS.**

## Outreach: Getting Girls Interested in Fire Management Careers



**FIGURE 20. OVER 700 WYOMING GIRLS CAME TO A WORKSHOP TO LEARN ABOUT SCIENCE, INCLUDING WILDLAND FIRE MANAGEMENT AND ECOLOGY.**

RD&A staff were invited to the 2012 Wyoming Council for Women's Issues "Women in Science Conference" in Riverton, Wyoming (October 2012) that aims to teach teen girls about careers in science, as many teen girls in rural Wyoming do not have access to female role models in science careers. Staff developed a curriculum to teach the girls about fire weather, fire behavior, and fire ecology and helped them understand what types of jobs and career paths are available in fire management. The students went outside for a hands-on workshop using belt weather kits. Two workshops were taught with 20 girls in each.

## 3.2 Objective: Improve data delivery mechanisms for broader audiences.

### Integrated Reporting of Wildland Fire Information (IRWIN) Collaboration

The RD&A has been engaged in a significant partnership with the interagency fire data community through the IRWIN project, and as a result, transformative data delivery capabilities for WFDSS are on the horizon. The IRWIN project, sponsored by the Department of Interior Office of Wildland Fire, will serve as a conduit for real-time fire information between computer aided dispatch (CAD) systems, financial systems, operational fire reporting systems, and decision support systems. The groundwork, including definition of authoritative sources for data elements, development of data standards, and collaborative identification of business rules, has been laid this year, with implementation taking place in 2014. WFDSS will begin receiving fire information from authoritative systems, reducing workloads on dispatchers and other users who have had to manually enter fire information into WFDSS in the past, and improving data quality.

### WFDSS Data Coordination

The RD&A continued providing management oversight of the geospatial data sets included in WFDSS, processing and updating 53 individual data sets. A general data management plan and cadastral data plan were developed to cover future goals for data in the RD&A. Several new data sets were included in WFDSS to support decision-making on large wildland fires. One highlight: the RD&A partnered with the National Park Service (NPS) to incorporate into WFDSS a new "Estimated Ground Medevac Time" dataset, to encourage thoughtful decisions about risks to firefighters and how to mitigate those risks. Incorporating the layer into WFDSS had the dual benefits of eliminating the need for expensive, technical desktop software for users wishing to view the data, and including risk exposure to firefighters in the consideration of values at risk when planning fire management activities. For more information on the layer, including modeling techniques and source data, visit:

[http://wfdss.usgs.gov/wfdss\\_help/WFDSSHelp\\_Est\\_Grd\\_Medevac\\_Time.html](http://wfdss.usgs.gov/wfdss_help/WFDSSHelp_Est_Grd_Medevac_Time.html).

### 3.3 Objective: Develop applications for fuels treatment planning.

#### Evaluation of Interagency Fuels Treatment Decision Support System (IFT-DSS)

RD&A staff assisted with coordinating an independent review of IFT-DSS. RD&A staff collaborated with the various Regional Fire Science Consortia to conduct a series of nationwide workshops to solicit user feedback on IFT-DSS. Both webinar based and in-person workshops were held through the winter and spring. Over 120 users representing the five federal fire agencies, state fire programs, The Nature Conservancy and Universities attended the workshops to learn about IFT-DSS and fill out surveys that were included in the software evaluation.

#### Planning for Fuel Treatment Effectiveness

The RD&A fuels and the Forest Service Washington Office fuels staff is developing a process to evaluate implementation of fuel treatment projects and how to quantitatively measure effectiveness. A literature review on past successes and failures demonstrated how fuels treatments can be effective. Steps were outlined to guide managers through a process that begins with developing concise, measurable objectives and ends with thorough fire behavior analysis that articulates outcomes based on given fire behavior of concern. An evaluation of the strengths and weaknesses of the Interagency Fuel Treatment Decision Support System (IFT-DSS) was used as an example to develop a basic spatial process to evaluate fuel treatments.

Work on this subject has just begun and will continue in FY2014.



FIGURE 21. UNDERSTANDING THE EFFECTIVENESS OF FUEL TREATMENTS IS A TOPIC THE RD&A HAS BEEN INVESTIGATING.

#### Fire Regime Condition Class (FRCC) Survey

Management of the [www.frcc.gov](http://www.frcc.gov) website has been transferred from NIFTT to the RD&A, so an effort was undertaken to evaluate current use and effectiveness of the website, the various GIS data management tools, online courses and tutorials as well as the FRCC products that the LANDFIRE program produces. The NWCG Fuels Management Committee (FMC) in collaboration with the RD&A designed a questionnaire requesting user feedback on FRCC. Approximately 400 responses were collected to gain information on the following: How fire managers are assessing the condition of their landscapes; The effectiveness of FRCC training, and resources; FRCC software tools; Needed enhancements to FRCC; and How FRCC is used among agencies.

The results of the survey are being analyzed and will be summarized in a journal article and on the FRCC website. This information will contribute to the future direction of FRCC, or perhaps the development of a different indicator of land health or fire regime integrity.

## Support for Fire Regime Condition Class (FRCC) and National Interagency Fuels and Technology Transfer (NIFTT)

RD&A Staff manage six University of Idaho (UI) personnel under a Cost Reimbursable Agreement. The UI agreement was established to support cumulative development, maintenance, and improvements of a comprehensive curriculum for assessing fire behavior, fire effects, fire regimes, and vegetation dynamics. Curricula include online and classroom courses, classroom workshops, web information and help aids, and skill development tools for indoor and outdoor learning applications. Staff from UI continued to maintain information contained on the [www.nifft.gov](http://www.nifft.gov) and [www.frcc.gov](http://www.frcc.gov) websites. It is anticipated that in early spring 2014 the nifft.gov website will be fully incorporated into the RD&A's website ([www.nwcg.wfmrda.gov](http://www.nwcg.wfmrda.gov)).

UI participation in the RD&A fuels management projects allows for independent review and feedback of fuels technology transfer products as well as links to professional education resources. The UI staff updated the Vegetation Dynamics Learning Pathway and completed an introductory module, tested *Articulate* software for use in creating learning modules for fuels management and fire ecology applications, and implemented a Learning Management System called "Moodle" on FRAMES in order to host in-house online courses. This will streamline user registration and allow for more freedom and control by course administrators and instructors.

### 3.4 Objective: Support training for fuels treatment planning

#### Support for Current Fuels Treatment Planning Applications

Support for fuels treatment planning applications has continued. UI Staff developed Frequently Asked Questions (FAQs) for each of the Fuels and Data Management Tools offered on the NIFTT.gov website and provide customer support via three helpdesks: [helpdesk@nifft.gov](mailto:helpdesk@nifft.gov), [helpdesk@frcc.gov](mailto:helpdesk@frcc.gov), and [helpdesk@landfire.gov](mailto:helpdesk@landfire.gov).

The following table conveys the status of the current tools.

Tool	Version	Status
Wildland Fire Assessment Tool (WFAT)	v. 2.4.0	New version released; compatible with ArcMap 10.1/10.2
Fire Regime condition Class Mapping Tool (FRCCmt)	v. 3.2.0	New version released; compatible with ArcMap 10.1/10.2
Area Change Tool (ACT)	v. 3.2.0	New version released; compatible with ArcMap 10.1/10.2
Multi-Raster Mapping Tool (MRCT)	v. 1.1.0	New version released; compatible with ArcMap 10.1/10.2
S-Class Mapping Tool	Beta	To be tested in 2014 to modify LANDFIRE data when analyzing FRCC data layers.



### **Fuels Professional Resource Portal**

The RD&A staff with the assistance of detailers began work on a fuels and fire ecology website to provide “one-stop” opportunities for fire managers working on fuels and fire related projects to find information and resources related to their work. Career development information including education and training offerings will be highlighted so users can identify resources related to Interagency Fire Program Management (IFPM) standards.

### **Integrate 40 Fire Behavior Fuel Models and Nomograph Online Courses into NWCG Fire Behavior Curriculum**

There is a recognized lack of formal instruction of the Standard 40 Fire Behavior Fuel Models in NWCG curriculum or other trainings. RD&A Staff developed a Beta module of the 40 Fire Behavior Fuel Models and will work to incorporate the materials into NWCG courses S-390 and RX341 in FY2014.

### **Participate on Fuels Management Committee Task Team - Fuels Specialist Workforce Development**

The NWCG Fuels Management Committee solicited the RD&A to assist with reviewing, updating and delivering a current Fuels Management Workforce Development plan. In the spring of 2013 a series of webinars were conducted to define the current state of fuels management training and available resources. The goal of this initiative is to make it easier for any employee who has fuels management responsibilities to understand what competencies are needed to perform in their current or desired position and where to go in order to gain the requisite knowledge and skills. The end-state is seen as a workforce with a higher overall skill-set and a reduction in the time necessary to reach competency due to a better defined and more focused development program. The RD&A with its expertise in developing online training, decision support tools and technology transfer products will continue to actively participate and coordinate efforts in fuels workforce development.



**FIGURE 22. FIREFIGHTERS IGNITE FLASHY GRASS FUELS PRIOR TO IGNITION OF THE FORESTED FUELS THAT MIGHT THROW EMBERS.**



**FIGURE 23. COORDINATING FUELS PROJECTS OFTEN REQUIRES INTERDISCIPLINARY TEAMS MEETING AT FIELD SITES.**

### 3.5 Objective: Evaluate, test, identify and suggest WFDSS enhancements that support the field.

#### WFDSS Awarded



WFDSS, an initiative led by the Forest Service, with support from the Department of Interior, assists fire managers and analysts in making strategic and tactical decisions for wildland fires. It integrates fire modeling software

applications into a single, one-stop-shopping web-based system, accessing high performance computers for modeling and streamlining the sharing of analyses and incident decisions across all levels of management. **The development and application of WFDSS has received the 2013 Award for Excellence in Technology Transfer.** WFDSS was developed by the RD&A and other RMRS scientists and collaborators. This award, presented annually by the Federal Laboratory Consortium (FLC), recognizes lab employees who have accomplished outstanding work in technology transfer. The Wildland Fire Management RD&A and cooperators have worked extensively to train and educate more than 8,000 users in WFDSS since 2009. The award was presented during a ceremony on April 25, 2013 at the FLC national meeting in Colorado.

#### Improvements and Enhancements to WFDSS Continue

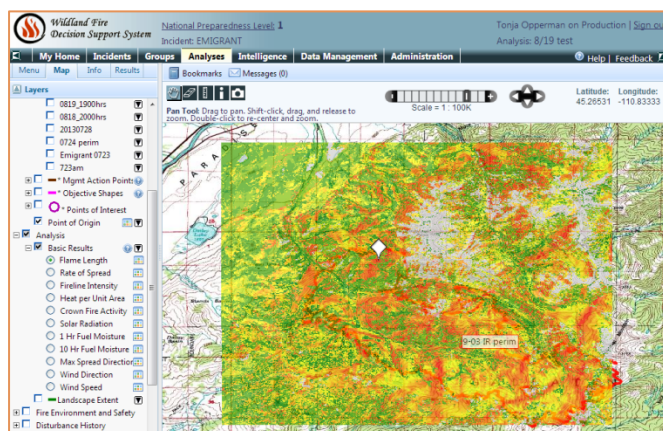
WFDSS is continually updated to provide user enhancements and address software issues. Documentation and help files are updated to reflect recent changes to WFDSS as new versions were released in December, March, May, and August. Features were added to allow for bookmarking, grouping fires for "complexes", and managing fires with a spatial fire management plan. Several enhancements to WFDSS also take place behind-the-scenes. This year the ArcGIS

licenses were updated to version 10.1 to bring WFDSS into alignment with other services it utilizes. Several validation projects are ongoing to test Near Term Fire Behavior and FSPro.

The RD&A initiated a WFDSS enhancement in coordination with the Monitoring Trends in Burn Severity (MTBS) program managed by the Remote Sensing Application Center.

Although the application is not fully functional, coordination will continue to

improve this web service feature.



**FIGURE 24. WFDSS FIRE BEHAVIOR TOOLS ARE USED FOR DECISION-MAKING.**

#### WFDSS Mobile Improvements

The RD&A tested and developed a mobile application called 'WFDSS Lite,' allowing Agency administrators a quick way to view key components of the fire decision, and update the periodic assessment or approve a decision from a mobile device. The Lite application, initially was released in 2012, had enhancements and improvements made in FY2013. WFDSS Lite is not specific to a single operating system, allowing managers increased mobility while keeping informed and approving decisions throughout the fire season.



## THE FUTURE OF THE RD&A FROM THE DEPUTY PROGRAM MANAGER—LISA ELENZ



The RD&A looks forward to the future of wildland fire management as chartered focus areas continue to be defined and new paths forward are identified. The team is moving ahead with new ideas and relationships while always keeping an eye on efforts developing in research and in the field. Close coordination with groups beyond the RD&A will lead to innovations and improvement of decision making tools in wildland fire and fuels management.

Continual efforts to partner with the National Oceanic and Atmospheric Administration, Predictive Services, the research community and a new chartering of the National Fire Decision Support Center (NFDSC) will further new developments and ideas. Some areas identified for resolution and development include: planning for the update and maintenance of Cadastral Data; testing and completion of the Incident Risk Console; working with NOAA and National Centers for Environmental Prediction (NCEP) to build a historic gridded weather data set for use in fire behavior analysis and research; coordination with the IRWIN project as it moves forward to seamlessly pass data between various reporting and analysis systems; and working with the Interagency Wildland Fire Information & Technology organization to assist with future technological development needs. Underlying many of the above listed tasks is the continued support to the risk based approach to wildland fire management, supporting further refinement of utilization of the iterative risk process in WFDSS and assisting with training of Line Officers in risk decision making.

2014 will bring new opportunities to the RD&A as we fill three vacant positions. We will continue to focus on strong partnerships and effective communications with the field, with research, with management and with collaborators, as these actions are essential to supporting the interagency fire community.



**FIGURE 25. A FIRE BEHAVIOR ANALYST MONITORS FIRE BEHAVIOR DURING A BURNOUT OPERATION ON A WILDLAND FIRE.**



## APPENDIX A: FY13 ACTIVITIES

### Cooperative agreements/partnerships

- Air Fire Program, Pacific Northwest Research Station, <http://www.airfire.org>
- LANDFIRE Program, [www.landfire.gov](http://www.landfire.gov)
- Cooperative agreement and development of Board of Directors for oversight of DOI Fire Application Specialists and their participation in the WRM RD&A and the NFDSC
- Desert Research Institute (DRI), <http://www.dri.edu>
- National Oceanic and Atmospheric Administration (NOAA) and the National Weather Service NWS
- Fire, Fuel, and Smoke Science Program, RMRS, <http://firelab.fire.org>
- Human Dimensions Program, RMRS
- 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](http://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](http://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](http://www.firescience.gov)
- Northern Rockies Fire Science Network, <http://nrfirescience.org>
- National Wildfire Coordinating Group (NWCG), [www.nwcg.gov](http://www.nwcg.gov)
- National Predictive Service Program (NIFC), [www.predictiveservices.nifc.gov](http://www.predictiveservices.nifc.gov)
- USFS Fire & Aviation <http://www.fs.fed.us/fire>
- Pacific Southwest Research Station, [www.fs.fed.us/psw](http://www.fs.fed.us/psw)
- Pacific Northwest Research Station, [www.fs.fed.us/pnw](http://www.fs.fed.us/pnw)
- The Nature Conservancy (TNC), [www.nature.org](http://www.nature.org)

### Publications

- "LANDFIRE"—a national vegetation/fuels data base for use in fuels treatment, restoration, and suppression planning" Forest Ecology and Management, Volume 294, 15 April 2013, Pages 208-216.
- Kevin C. Ryan (Missoula Fire Sciences Lab), Tonja S. Opperman (WFM RD&A)
- "Leveraging the Geospatial Advantage", Wildfire magazine, March/April 2013, Ben Butler and Andrew Bailey.

- “Decision making for wildfires: A guide for applying a risk management process at the incident level”, Gen. Tech. Rep. RMRS-GTR-298WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. Station ID: GTR-RMRS-298 Pages 58, 2013 Taber, Mary A.; Elenz, Lisa M.; Langowski, Paul G.
- “Fiscal Year 2011 vs. 2012”. Fire Season Comparison Infographic. Wildland Fire Management RD&A <http://www.wfmrda.nwcg.gov/2011-2012%20Comparison.php>
- Linking a Fire Probability Model to Management Decisions: Outcomes from Recent Fires in Yellowstone National Park. Co-Author Tonja Opperman. Paper presentation at 11th Biennial Scientific Conference on the Greater Yellowstone Ecosystem, Mammoth, WY. October, 2012.

## **Presentations (Oral/Poster)**

- Advanced Fire Behavior Practices- Workshop presentation, facilitators Erin Noonan-Wright and Dan Mindar. Raleigh, North Carolina. 4th Fire Behavior and Fuels Conference, Feb. 18-22, 2013.
- Fuel Treatment Effectiveness and Longevity in California Coniferous Forests, Erin Noonan-Wright. Raleigh, North Carolina. 4th Fire Behavior and Fuels Conference, Feb. 18-22, 2013.
- A Day in the Life of a Virtual Analyst- STFB and Holloway Fire, Erin Noonan-Wright. S-495 Missoula, Montana, April 12th, 2013.
- Risk Assessment in WFDSS, Erin Noonan-Wright. Local Fire Management Leadership. Missoula, April 9th, 2013.
- Effectiveness and Longevity of Fuel Treatments in Coniferous Forests across California. Erin Noonan-Wright. Webinar presentation to California Joint Fire Science Consortium, May 16th, 2013.
- Estimated Ground Medevac Layer and intended use in WFDSS. Andrew Bailey and Ben Butler. NWCG Risk Management Committee, January 30th, 2013.
- Fire Ecology and History. Mitch Burgard. Fire Ecology in the Crown of the Continent, Polebridge, Montana. January 22, 2013.
- Refresher on WFDSS Analysis for Alaska users, Mitch Burgard. Webinar for Alaska Modeling Workshop.
- Fire Weather and Fire Ecology. Tonja Opperman. Workshop presentation for Wyoming Women in Science. October 12, 2012.
- Use of the Wildland Fire Decision Support System for Implementation of the Greater Yellowstone Coordinating Committee’s Whitebark Pine Strategy, Co-Author Tonja Opperman. 5th International Fire Ecology and Management Congress: Uniting Research, Education, and Management. Portland, Oregon. December, 2012.

## **2013 Projects Organized by Charter Focus Areas**

### **Coordinate relevant and timely fire science application**

- Incident Risk Console (RisC) Development
- Coordination with the Pacific Northwest AirFire team and support protocols and planning
- Outreach with Research Stations
- Collaboration with Desert Research Institute (DRI) Climate, Ecosystem, and Fire Applications (CEFA)
- Collaboration with LANDFIRE

- Collaboration with Fire Science Consortia
- Collaboration with DOI Fire Program Effectiveness
- Collaborate with the Interagency Reporting of Wildland-Fire Information (iRWin) project
- Collaborate with the Wildland Fire I&T workgroup

#### **Develop and Support a Wildland Fire Decision Support System (WFDSS)**

- Integrate Remote Sensing Application Center's Monitoring Trends in Burn Severity grids and polygons into WFDSS Analysis Maps
- Query of Line Officers and Fire Managers on WFDSS/Decision Support understanding and use
- Improve, update, and support Risk Assessment and Inventory Tools
- WFDSS data coordination and documentation
- Incorporate available cadastral datasets and increase awareness of data utility
- Implement Interagency Data Standard
- Improve/Enhance WFDSS Mobile
- Improve Near Term Fire Behavior Analysis Tool
- Continue FSPro Validation efforts

#### **Coordinate technology and development efforts for hazardous fuels and vegetation management and support interagency training in this area**

- Continue integration of NIFTT with the WFM RD&A
- USFS Region 5 Fuel Treatment Effectiveness and Effects Monitoring
- Non-forested lands fuel model transition research project collaboration
- Develop Information for Implementation of the Interagency Fuels Treatment Decision Support System (IFTDSS)
- Participate in IFTDSS Evaluation
- Manage NIFTT Contracts
- Developed Survey of Fire Regime Condition Class (FRCC) use among fire managers
- Coordinate with interagency partners regarding planning for effective fuels treatment
- Provide Helpdesk support for NIFTT tools and online courses
- Participate on FMC task team regarding fuels specialist workforce development

#### **Develop applications, disseminate information and conduct training for existing and emergent research priorities**

- Assist Fire Use Subcommittee in writing a Decision Making General Technical Report
- Updated the USFS Line Officer Desk Reference for Fire Program Management
- Support National and Geographic Area Fire Behavior Workshops
- Support National and Regional level Courses
- Mentee and Detailer Training Opportunities
- Coordinate with NWCG Training

#### **Participate in and manage the National Fire Decision Support Center (NFDSC)**

- Coordinate monthly NFDSC research calls
- Provide on-call fire behavior and decision support assistance to the field 24/7/365
- Maintain Specialist (LTAN, FBAN, GSAN, Tech spec) skills list

- Coordinate with National Fire Offices regarding annual fire season direction
- Communicate Decision Support Center Standard Operating Procedures
- Geographic Area Information Coordination

## Workshops & Conference Attendance

- 5th International Fire Ecology and Management Congress: Uniting Research, Education, and Management. Portland, Oregon. December 3-7, 2012.
- 4th Fire Behavior and Fuels Conference, Raleigh, North Carolina. Feb. 18-22, 2013
- Regional Fire Behavior Workshop, Forest Service Region 1 and 2, Spring 2013.
- IFTDSS (Interagency Fuels Treatment Decision Support System) Evaluation Workshops. Twelve workshops throughout winter/spring 2012/2013.

## Training/Course Instruction:

- Rx-510 Advanced Fire Effects, Tucson, AZ, February, 2013
- S-495 Geospatial Fire Analysis, Interpretation, and Application, Tucson, AZ, April 2013.
- Local Fire Management Leadership (FML), Missoula, Montana, April, 2013 and Boise, Idaho February, 2013
- NAFRI Fire Management Leadership, Tucson, AZ March, 2013
- S-400 Incident Commander, Boise, Idaho, February, 2013
- S-520 Advanced Incident Management, March, 2013
- S482 Advanced Fire Management Applications, Fall, 2013

## Organizational Representation

- NWCG Forest Service Executive Board Representative
- NWCG Fire Behavior Subcommittee Chair
- NWCG Fire Planning Subcommittee Representative
- NWCG Fire Reporting/209 Subcommittee Representative
- NWCG Fire Danger Subcommittee Member
- NWCG Geospatial Subcommittee
- LANDFIRE Liaison
- 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 Chairmen, 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
- MobilTechnologies Working Group member
- 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
- Cohesive Strategy Team Member
- Interagency Fuels Treatment Decision Support System Liaison
- 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
- Wildland Fire Institute Liaison
- Enterprise Geo-spatial Portal (Fire Common Operating Picture) Representative
- Fire Reporting Mobile Application Development Team Representative
- Dashboard WFM RD&A Representative

## APPENDIX B: FY14 PROGRAM OF WORK

### Integrate Research and Technology into Decision Support Systems for Better Decision Making

- Develop an online application for real-time downscaling of forecast winds
- Evaluate the Rocky Mountain Center gridded forecast versus the National Digital Forecast Database (NDFD) forecast and its potential use in WFDSS
- Work with partners to support and improve the Risk Console (RisC)
- Support Interagency Spatial Fire Management Planning efforts

### Assist the Field to Increase and Improve Inputs for Timely Risk Based Decisions

- Work with the Rocky Mountain GACC to develop a new dynamic Predictive Services Website
- Provide incident decision support to the field
- Work with NFDSC members to develop training modules for decision-making and risk gaming
- Provide direct support to field in Risk Assessment: update/improve maps, tools, models, training

### Evaluate, Test, Identify and WFDSS Enhancements that Support the Field

- Investigate and evaluate WFDSS enhancements and improvements for field, area, and national managers including: utilizing User Center Design Review, model improvements, risk assessment, improved fuel and weather data

### Develop Applications for Fuels Treatment Planning

- Coordinate with partners on existing fuels risk assessment tools/processes
- Develop and support planning for effective fuels treatment in coordination with Forest Service Fire and Aviation Management Fuels/Fire Ecology program
- Prepare for IFTDSS implementation as interagency involvement is determined
- Manage NIFTT Contractors and University of Idaho agreement and staff

### Incorporate Fire Effects into Decision Making

- Investigate methods to help units incorporate fire effects objectives in decision-making on wildland fires.

### Train the Wildland Fire Community in Utilization of Sponsored Products

- Coordinate with National Wildfire Coordinating Group (NWCG) training
- Provide training/support on RisC and risk products in WFDSS
- Evaluate, assess, improve the materials and training for field users regarding WFDSS as a risk assessment tool
- Support national and geographic area fire behavior (or other) workshops
- Support national and regional level courses
- Provide training opportunities for field through WFM RD&A detailer/mentee program

### Increase Awareness of the Rocky Mountain Center (RMC)

- Develop RMC Training & Outreach
- Continue RMC integration into WFM RD&A

### Support training for Fuels Treatment Planning

- Assist with integration of 40 FB Fuel Model and Nomograph Online Courses into NWCG fire behavior curriculum
- Provide Help Desk Support for NIFTT tools and online courses
- Participate on Fuels Specialist Workforce Development Task Team
- Coordinate Interagency data standards and support improved Cadastral data
- Coordinate with Wildland Fire Information and Technology (I&T) and support Integrated Reporting of Wildland fire Information (IRWIN)
- Support data acquisition and automation, new imagery layers for WFDSS, and LANDFIRE futuring efforts