Seminar Series

Date	Speaker - *Affiliation*	Seminar Title	Host	Video Recording
Jan 29, 2015	Tom Bansak, Research Scientist/Development Coordinator, University of Montana	The Flathead Lake Biological Station: Sentinel of the Lake	Chuck McHugh	View Recording
Feb 5	LaWen Hollingsworth, Fire Behavior Specialist, FMI	Fire Management and Fire Use in Eastern Province of Zambia	K.Lee	View Recording
Feb 12	Diane Smith, Research Historian, RMRS	100 Years of Wildland Research: Adventures in the Archives	K. Lee	View Recording
Feb 19	Ashley Ballantyne, Assistant Professor of Bioclimatology, University of Montana	Diagnosing the global carbon cycle: what can we learn from satellite and atmospheric observations?	L. Hollingsworth	View Recording
Feb 26	Matt Jolly, Research Ecologist RMRS	A new look at the seasonal dynamics of live fuel physio-chemistry and their potential influence on wildland fire behavior	K. Lee	View Recording
Mar 5	Ann Suter, Statistician, Missoula Technology and Development Ctr	The Forest Service Missoula Technology and Development Center: A Brief Overview of Current Work	K. Lee	Recording not available
Mar 12	Michael Hand, Research Economist, RMRS	The Influence of Incident Management Teams on Suppression Resource Use	K. Lee	View Recording
Mar 19	Mark Finney, Research Forester, RMRS	Influence of buoyant dynamics on wildfire spread	Chuck McHugh	View Recording

Please see page 2 for Seminars offered in March-April 2015

Seminar Series

Date	Speaker - *Affiliation*	Seminar Title	Host	Video Recording
Mar 26	Brad Gillespie, District Fire Management Officer, Swan Lake R.D. Flathead National Forest	Reintroduction of fire in the Mission Mountain Wilderness	C. McHugh	No Video Available
Apr 2	Vince Archer, Soil Scientist, Above and Beyond Ecosystems	Soils analysis to support large-scale range assessment	K. Lee	
Apr 9	No presentation this week			
Apr 16	Sharon Hood, Fire Ecologist, University of Montana	Fortifying the Forest: Roles of Tree Defense, Fire, and Stand Structure in Resistance to Bark Beetles	K. Lee	View Recording
Apr 23	Chuck McHugh, Fire Spatial Analyst, *RMRS*	Comparison of temperature and relative humidity values from Sling Psychrometers and Electronic Weather Meters in an Controlled Environment	D. Lutes	View Recording
Apr 30	Vita Wright, PI *Northern Rockies Fire Science Network*	Fire Science Communication in the Northern Rockies	F.A. Heinsch	

FireLab

Seminar Series

The Flathead Lake Biological Station: Sentinel of the Lake.

Founded in 1899. the University of Montana's Flathead Lake Biological Station (FLBS) is one of the oldest biological stations in the US. FLBS conducts ecological research with an emphasis on freshwater, particularly Flathead Lake and the Flathead watershed. This presentation will provide an overview of what we do at the Bio Station, highlighting research and findings in several areas of expertise. These include Flathead lake ecology, foodweb and invasive species, as well as river and flooplain ecology.

Tom Bansak, Research Scientist/Development Coordinator, Flathead Lake Biological Station University of Montana

Date: January 29, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
5775 West U.S. HWY 10,
Missoula, MT 59808.

For more information, please contact missoula_firelab_seminars@fs.fed.us **or visit** www.firelab.org

FireLab

Seminar Series

LaWen Hollingsworth
Fire Behavior Specialist,
Fire Modeling Institute,
Rocky Mountain Research Station

Date: February 5, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
5775 West U.S. HWY 10,
Missoula, MT 59808.

For more information, please contact missoula_firelab_seminars@fs.fed.us **or visit** www.firelab.org

Fire Management and Fire Use in Eastern Province of Zambia

A team of four natural resource management experts convened in October, 2014 to conduct a fire regime assessment in Eastern Province of Zambia. The team included a multinational assemblage from the United States and Zambia tasked with the following objectives: 1) gain preliminary insights into the current status of fire management and fire use in Eastern Province, Zambia, 2) assess the role of fire in the regeneration and maintenance of the dominant vegetation present in the terrestrial ecosystems, and 3) provide recommendations for fire management training and equipment needs for Zambia Forestry Department and partner agencies in Eastern Province.

This mission was prompted by requests from Forestry Department personnel in Zambia to the United States Agency for International Development (USAID) for formal fire management training. USAID contacted the United States Forest Service's (USFS) International Programs (IP) with the training request. Together, USFS, USAID, and Zambian partners determined that this mission should contribute to understanding how, when, where, and why fire is used in Eastern Province of Zambia.

FireLab

Seminar Series

Diagnosing the global carbon cycle: what can we learn from satellite and atmospheric observations?

Ashley Ballantyne, Assistant Professor of Bioclimatology, University of Montana

The amount of carbon being taken up by the biosphere is clearly increasing; however, the variance in the global carbon cycle also appears to be increasing. This increasing variance may be indicative of C sink instability, or it may simply be noise in the global C cycle. Therefore identifying the mechanisms driving this variance is critical for predicting future behavior of the global C cycle. Here we combine satellite observations of terrestrial productivity and atmospheric observations of CO_2 and its isotopic composition as diagnostics to gain new insight into the changing behavior of the global C cycle. We use these observations to partition net C uptake into photosynthetic gains and respiratory losses. Based on this approach, we conclude that much of the observed variance in the global C cycle appears to be due to the respiratory response of the terrestrial tropics and that much of the recently observed increase in net C uptake is due to diminished respiratory losses during the well documented warming hiatus. Lastly, we use isotopic analyses of CO_2 in this respiratory flux to infer the biosphere's response to changing climate. From these analyses we conclude that water vapor feedbacks present a first-order control on the biosphere's capacity to continue taking up atmospheric CO_2 as Earth's atmosphere continues to warm.

Date: February 19, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
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FireLab

Seminar Series

A new look at the seasonal dynamics of live fuel physio-chemistry and their potential influence on wildland fire behavior

Matt Jolly, Research Ecologist, RMRS

Wildland fires spread through combinations of living and dead vegetation and the largest fires generally occur in fuels that are dominated by living plants. While much is known about the factors that regulate fire spread through dead fuels, the controlling factors of live fuel flammability have proven elusive. Here we present an integrated exploration of the spatial and temporal variations in the live wildland fuel physical and chemical characteristics. We examine how these properties act together to influence spatial and temporal variations in many fuel characteristics that are known to heavily impact flammability. Specifically, we show how seasonal variations in foliar chemistry interact to control key fuel thermo-physio-chemical characteristics, such as foliar density, heat of combustion and moisture content and we demonstrate that live fuel chemistry is vastly different from that of comparable dead fuels. Based on these findings, we suggest that an ecological approach to exploring live fuel flammability is warranted and we show how such an approach can shed light on crown fire potential. Ultimately, our findings show that existing theories of live fuel ignition based on moisture content are heavily flawed and new approaches are needed to better characterize the likelihood of wildland fires spreading through live fuel-dominated landscapes.

Date: February 26, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
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Seminar Series

The Influence of Incident Management Teams on Suppression Resource Use

Michael Hand, Research Economist, RMRS

Wildfire incidents present complex management problems, even for experienced and highly trained management organizations. This paper explores how managers of highly complex incidents - those requiring Type I or Type II incident management teams (IMTs) - adjust suppression resource orders in response to changing conditions. Daily observations of suppression resource orders for incidents where a Type I or Type II IMT was assigned are linked to at least one of approximately 90 IMTs assigned to the incident and daily fire conditions drawn from ICS-209 reports. A panel-data approach is used to model the amount of resources ordered with fireline-building capability as a function of daily incident conditions, regional differences, and individual IMT effects. Results indicate wide variation in the amount of suppression resources ordered by managers after controlling for observable fire conditions. Significant variation in resource orders exists between different regions and among different IMTs. Results may inform decision support activities that seek to identify circumstances where low-cost and low-exposure resource orders are warranted based on fire characteristics; examples using the model in a decision support environment are presented.

Date: March 12, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
5775 West U.S. HWY 10,
Missoula, MT 59808.

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FireLab

Seminar Series

Influence of buoyant dynamics on wildfire spread

Technology has improved our utilization of existing fire models but has contributed little to advancing knowledge of fire spread. The knowledge of physical processes, and their organization in producing fire spread, is essential to reliably modeling wildland fire behaviors beyond current capabilities (crown fire, thresholds etc.). To date, this knowledge has been so incomplete that physical models have been based on assumptions borrowed from other disciplines without considering the unique context of fire and fuels in wildlands. Even now, the roles of radiation and convection have yet to be conclusively determined. This presentation will report results of ongoing experimental research that has revealed how forward convective heating and particle ignition in spreading fires derives from buoyancy-induced instabilities and vorticity.

Mark A. Finney, Research Forester, RMRS

Date: March 19, 2015
Time: 11:00 AM-12:00 PM
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Missoula, MT 59808.

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Seminar Series

Brad Gillespie, DFMO; Justin Kaber, AFMO-Fuels, & Brent Olson, AFMO-Operations, Swan Lake R.D. Flathead National Forest

Date: March 26, 2015
Time: 11:00 AM-12:00 PM
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Re-Introduction of Fire into the Mission Mountain Wilderness

The Mission Upland Burn Project Area lies within the Piper Creek Drainage on the Northern end of the Mission Mountain Wilderness (MMW). Our analysis indicates that a lightning-caused fire in July or August would pose serious threats to life and/or property within or adjacent to the Wilderness. As a result, we completed an environmental analysis to prescribed burn 1036 acres with a maximum manageable area of 2500 cares within and adjacent to the Piper Creek drainage. The purpose of the project was to reduce the amount of fuels within the project area, so future lightning-caused fires would be allowed to play a more natural role within and outside the wilderness. It also reduces the risk of a wildland fire escaping the wilderness.

In the fall of 2014, The District successfully implemented the Mission Upland prescribed burn. The goal of this presentation is to provide a real life example of a landscape level prescribed burn within Wilderness. Specifically, the project area history, NEPA planning efforts, implementation, and need for future projects will be discussed.

FireLab

Seminar Series

Soils analysis to support large-scale range assessment

Vince Archer, Soil Scientist, Above and Beyond Ecosystems

Federal agencies continue to turn to large scale landscape assessments to help prioritize management. For rangelands in the west, there is increased pressure to renew permits; however, mass retirements have taken away staffing resources needed to complete the process. Also, increased scrutiny by stakeholders have demanded greater burden of proof to support analysis. Thus, more attention has turned to using remote sensing as a tool to accomplish range assessment.

New access to remote sensed imagery provided by the google earth engine has now enabled sharper spatial resolution for assessing condition and trend. Climate variables and leaf area index are used as predictors for vegetation condition. However, a water balance approach that relies on soil properties greatly enhances the interpretation. SSURGO datasets, where available, provide baseline data for assessing available water holding capacity. When working on large landscapes, data holes and inconsistencies between soil surveys create roadblocks for conducting these seamless landscape assessments. We as managers are teaming up with the Remote Sensing Analysis Center to (1) critique our formula for calculating available water holding capacity and (2) interpolate soil properties where SSURGO is lacking or inconsistent. A case study on Arizona BLM lands will be presented.

Date: April 2, 2015
Time: 11:00 AM-12:00 PM
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Missoula, MT 59808.

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FireLab

Seminar Series

Comparison of temperature and relative humidity values from Sling Psychrometers and Electronic Weather Meters in an Controlled Environment

Chuck McHugh
Fire Spatial Analyst, *RMRS*

Belt weather kits for recording of weather information have been in use since 1959. The use of a sling psychrometer from these kits is standard practice for the recording of dry and wet bulb temperatures to calculate relative humidity. Electronic based meters for recording weather information could replace belt weather kits for the recording of this information, streamlining the process and eliminate many of the errors often associated with the use of the sling psychrometer. However, anecdotal evidence from fire managers suggest relative humidity values of 5-20% lower from electronic meters compared to a sling psychrometer. Thus contributing to a disbelief and lack of confidence in the data these electronic meters provide field personnel.

We will present preliminary results of a two phase study currently in progress comparing measured temperature and relative humidity values from electronic meters -such as the Kestral®- to measured values of temperature and calculated relative humidity using a sling psychrometer. All measurements are taken in an environmental chamber at specific combinations of temperature and relative humidity. This study comparing values from the two types of measuring devices in a controlled environment is the first that we are aware of.

Date: April 22, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
5775 West U.S. HWY 10,
Missoula, MT 59808.

For more information, please contact missoula_firelab_seminars@fs.fed.us **or visit** www.firelab.org

FireLab

Seminar Series

Fire Science Communication in the Northern Rockies

Since Spring 2012, the Northern Rockies Fire Science Network (NRFSN) has been serving managers, scientists, and others engaged in fire and fuels management in forested ecosystems of Idaho, Montana, and Wyoming. The NRFSN brings people together to strengthen science-management collaborations, synthesize science, and enhance science application around critical management issues. This presentation will provide context for the NRFSN, discuss current activities and projects, and explain how scientists can engage with us to increase awareness, understanding, and use of scientific knowledge and tools.

Vita Wright,
Northern Rockies Fire Science Network

Date: April 22, 2015
Time: 11:00 AM-12:00 PM
Where: The Fire Science Lab
5775 West U.S. HWY 10,
Missoula, MT 59808.

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