



Rocky Mountain Research Station
Missoula Fire Sciences Lab
2018-2019 Seminar Series

2018-19	Title/Presenter Click on the Title to view abstract	
Oct 4	An update on the High-Resolution Rapid Refresh model / Joe Olson, NOAA	View Recording
Oct 11	The essential and irrepressible role of fire in western forests / Steve Arno	View Recording
Oct 25	WFDSS and Relative Risk Assessment / Erin Noonan, USFS	View Recording
Nov 1	Improving Parameterization of Combustion Processes in Coupled Fire-Atmosphere Models through Remote Sensing / Scott Goodrick, USFS	View Recording
Nov 8	Wildland Fire Chemicals and Aerial Delivery Systems / Shirley Zylstra, NTDC	View Recording
Nov 15	High survival of small whitebark pine at alpine treeline edges – and in forest interiors – after widespread mountain pine beetle outbreaks in the US Northern Rockies / Colin Maher	View Recording
Nov 29	Coldest observed temperature in CONUS at Rogers Pass / Corby Dickerson, NOAA	View Recording
Dec 6	Atmospheric factors for large plumes on the Rice Ridge Fire / Ryan Leach, NOAA	View Recording
Dec 13	Human Performance & Innovation and Organizational Learning RD&A: The Wildland Fire Meta-Review / Sara Brown, Acting Director of the Human Performance and Innovation & Organizational Learning RD&A Program	View Recording
Jan 10	TBD	
Jan 17	Community Planning Assistance for Wildfires (CPAW) / Eva Karau, Kimiko Barrett, Kelly Pohl	

11:00 AM-12:00 PM

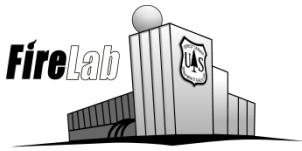
The Fire Science Lab , 5775 West U.S. HWY 10, Missoula, MT 59808.

2018-19	Title/Presenter
Jan 24	Locally Informed Land Use Planning in the Far North of Finland, Lapland / Sini Kantola
Jan 31	MASTIDON: a monster of a mastication project / Bob Keane
Feb 7	Shawn Urbanski
Feb 14	Forest restoration in the Sierra Nevadas / Sean Jeronimo
Feb 21	
Feb 28	Andrew Larson
Mar 7	Phil Higuera
Mar 14	
Mar 21	
Mar 28	
Apr 4	
Apr 11	"The Life in Smoke" thus far / Leda Kobziar
Apr 18	New Zealand project / Mark Finney
Apr 25	



2018-19	Title/Presenter
May 2	Bret Windom
May 9	
May 16	

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



Seminar Series

Joseph Olson,

USFS

Host: Natalie Wagenbrenner

Date: October 4, 2018

Time: 11:00 AM-12:00 PM

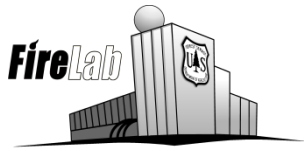
Where: The Fire Science Lab
5775 West U.S. HWY 10, Missoula,
MT 59808.

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

An update on the High-Resolution Rapid Refresh model

The High-Resolution Rapid Refresh (HRRR) is NOAA's real-time operational hourly updating forecast systems run at 3-km grid spacing. The HRRR uses the Advanced Research version of the Weather Research and Forecasting (WRF-ARW) as the model component of the forecast system. During the second installment of the Wind Forecast Improvement Project (WFIP 2), the HRRR has been targeted for the improvement of low-level wind forecasts in the complex terrain within the Columbia River Basin (CRB), which requires much finer grid spacing to resolve important topographic features in/near the CRB. Therefore, this project provides a unique opportunity to test and develop the HRRR physics suite within a very high-resolution nest ($\Delta x = 750$ m) over the northwestern US. Special effort is made to incorporate scale-adaptive flexibility into the HRRR physics suite, with emphasis on the representation of subgrid-scale boundary layer and orographic drag processes.

Many wind profiling and scanning instruments have been deployed in the CRB in support the WFIP 2 field project, which spanned 01 October 2015 to 31 March 2017. During the project, several forecast error modes were identified, such as: (1) too-shallow cold pools during the cool season, which can mix-out more frequently than observed and (2) the low wind speed bias in diurnal thermal trough-induced gap flows during the warm season. Development has been focused on improving these common forecast failure modes, among others, with the criteria of achieving at least neutral impacts in all other operational forecast objectives. This presentation will overview the HRRR forecast system, highlight the testing and development of various model components, and demonstrate improvements in forecast skill over original HRRR physics. Examples of case studies and retrospective periods will be presented to illustrate the improvements. Ongoing and future challenges in RAP/HRRR physics development will be touched upon.



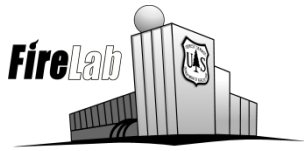
Seminar Series

Date: October 11, 2018

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



Seminar Series

Erin Noonan,

USFS

Date: October 25, 2018

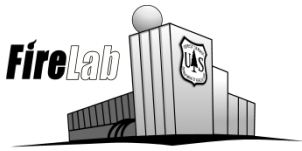
Time: 11:00 AM-12:00 PM

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

Spatial Differentiation of Wildfire Risk in the United States from Systematic Operational Risk Assessments – How Risk is Conceived by Land Managers

This research examines perceptions of risk by decision-makers during wildland fires using newly available data from the Wildland Fire Decision Support System (WFDSS), with an eye toward better understanding how fire managers are considering risk on the fires they manage. It explores preference for and aversion to high, moderate, and low ratings for the risk elements of value, hazard and probability that collectively constitute a measure of relative risk.



Seminar Series

Scott Goodrick,
USFS

Date: November 1, 2018

Time: 11:00 AM-12:00 PM

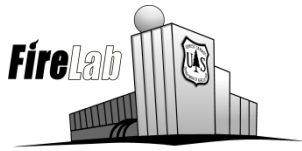
Where: The Fire Science Lab
5775 West U.S. HWY 10, Missoula,
MT 59808.

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

Improving Parameterization of Combustion Processes in Coupled Fire-Atmosphere Models through Remote Sensing

Coupled fire-atmosphere models intended to be used for landscape-scale fires (domains of hundreds of meters to 10s of kilometers), typically divide the simulation domain up into a mesh of grid cells and these grid cells typically range in size from 1-30 meters on a side. As the processes governing combustion of an individual fuel element occur on considerably smaller scales, the gridded model requires a means of describing these smaller scale, or subgrid, processes. Probability distributions are one method of describing the impact of such processes and is the approach used in the HIGRAD/FIRETEC model.

For the solid phase of combustion, the mass loss rate in the model is dominated by turbulent mixing and fraction of a cell combusting as determined by a probability density function based on a grid cell's temperature. We employ both visible and infrared video analysis to estimate these quantities. For the turbulent mixing, optical flow techniques are used in conjunction with particle image velocimetry on the visible videos to estimate a centimeter scale flow field in the vicinity of the fire which can be used to estimate the turbulence. Mass loss rate is estimated from infrared remote sensing techniques developed first in the laboratory and later used with satellites to estimate fire radiative power and fuel consumption. Results from a set of simple idealized fuel beds are shown along with preliminary results from natural fuel beds.



Seminar Series

Shirley Zylstra,
NTDC

Date: November 8, 2018

Time: 11:00 AM-12:00 PM

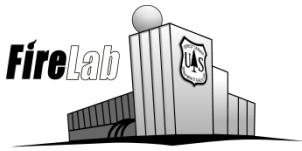
Where: The Fire Science Lab
5775 West U.S. HWY 10, Missoula,
MT 59808.

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

Wildland Fire Chemicals and Aerial Delivery Systems.

In 2017, approximately 57.3 million gallons of retardant was loaded onto airtankers. Of that, approximately 19 million gallons were dropped onto NFS lands. The use of fire chemicals is not without controversy. This presentation will summarize the various categories of wildland fire chemicals, their characteristics, and the environmental implications of their use.

Aerial delivery systems are utilized to distribute fire chemicals, primarily retardant, on the landscape. Knowledge of drop patterns, parameters influencing those patterns, application tactics and reasons for line failure will also be discussed.



Seminar Series

Colin Maher,
University of Montana

Date: November 15, 2018

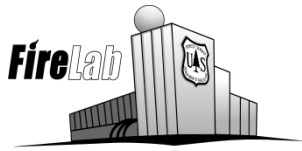
Time: 11:00 AM-12:00 PM

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

High survival of small whitebark pine at alpine treeline edges – and in forest interiors – after widespread mountain pine beetle outbreaks in the US Northern Rockies

Mountain pine beetles (*Dendroctonus ponderosae*; MPB) are causing extensive mortality of whitebark pine (*Pinus albicaulis*) throughout the species's range. In the highest mountains where these trees grow, they reach alpine treeline – the climatic boundary where growth forms transition from trees to shrub-like krummholz. Although treeline whitebark pine exist within a landscape of widespread MPB-caused mortality, these populations appear to have survived the most recent outbreaks. This observation motivated the hypothesis that stunted treeline growth forms escape MPB attack because their stems are too small to attract beetles, and that these habitats serve as refuges for whitebark pine. The purpose of this research was to determine if treeline ecotone populations could serve as refuges for whitebark pine from the most recent MPB outbreaks in the US Northern Rocky Mountains, and whether these populations represent the greatest potential for future whitebark pine population recovery. I surveyed mortality along 500 m transects at alpine treeline and other forest edges at 10 randomly selected sites in the US Northern Rocky Mountains. I found consistent mortality gradients at alpine treelines, but not at other edges. This supports the hypothesis that treeline habitats are refuges, and that treeline whitebark pine may avoid MPBs because of transitions in growth form. I observed limited reproductive output at alpine treelines, but these habitats may still serve as population refuges over long time periods. However, smaller surviving whitebark pine exist at greater density than dead ones (by ~200 per ha) throughout my study region, indicating a strong potential for these forests to recover from the recent MPB outbreaks in the short-term without a treeline refuge.



Seminar Series

Corby Dickerson,
NOAA

Date: November 29, 2018

Time: 11:00 AM-12:00 PM

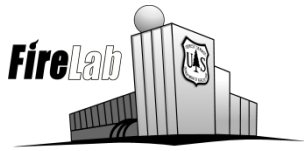
Where: The Fire Science Lab
5775 West U.S. HWY 10, Missoula,
MT 59808.

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

Coldest observed temperature in CONUS at Rogers Pass

One half mile west of Rogers Pass, and just south of the Continental Divide, a humble cabin was nestled next to a fledgling gold mine. The cabin sat within a small, 'saucer-shaped depression' in the landscape. It was 1954. The weather had been unrelenting: heavy, intense snow had fallen near continuously for seven days, totalling over five feet in settled depth, by 5pm on the 19th of January. And the temperature that morning had been a frigid -37F. But, unbelievably, these measurements themselves would ultimately pale in comparison to what would occur later that night.

By morning an incredible record breaking low temperature of -70°F was observed by volunteer observers at the 4 K's Mine near Rogers Pass. During this presentation I will share the meteorology behind this remarkable observation which for 22 years stood as the coldest temperature in the United States and still remains the coldest temperature in the contiguous states, to include Montana, of course. Furthermore I will discuss the story of these miners, the U.S. Weather Bureau's verification of this reading, along with my investigative efforts to locate the precise location where this observation was taken. Finally, I will share our collaborative efforts with the USFS to preserve this cabin as a historic site for future public interpretation.



Seminar Series

Ryan Leach

NOAA

Date: December 6, 2018

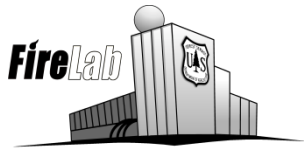
Time: 11:00 AM-12:00 PM

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

Two Days on the Rice Ridge Fire

Abstract: The Rice Ridge fire ultimately burned over 150,000 acres in western Montana in the summer of 2017. Two days stand out in particular, September 2nd and 3rd. Both days were hot, dry, and windy with Red Flag warnings issued by the local NWS office. However, on the 2nd the fire consumed roughly 12,000 acres, whereas on the 3rd it developed a pyrocumulus and burned almost 50,000 acres. In this talk, we will investigate the atmospheric differences between the two days that likely led to the development of a pyrocumulus and propose a technique forecasters can use to track and forecast pyrocumulus potential.



Seminar Series

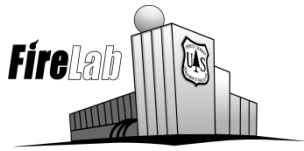
Colin Hardy,
USFS

Date: December 13, 2018

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



Seminar Series

TBA

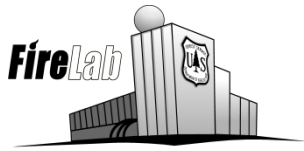
RMRS Missoula Fire Lab

Date: January 10, 2018

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



Seminar Series

**Eva Karau, Kimiko
Barrett, Kelly Pohl**

Affiliation

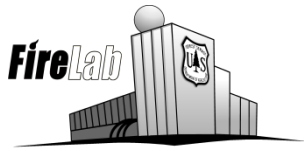
Host:

Date: January 17, 2018

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



Seminar Series

Sini Kantola

Geography Research Unit, University
of Oulu & Natural Resources,
Institute Finland (Luke)

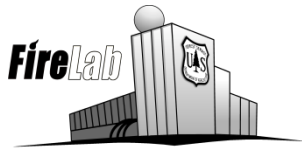
Date: January 24, 2018

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

Locally Informed Land Use Planning in the Far North of Finland,
Lapland– Guest Presentation by Sini Kantola.”



Seminar Series

Bob Keane,
RMRS Missoula Fire Lab

Date: January 31, 2018

Time: 11:00 AM-12:00 PM

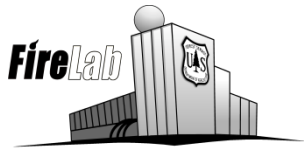
Where: The Fire Science Lab
5775 West U.S. HWY 10, Missoula,
MT 59808.

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

MASTIDON: a monster of a mastication project

Bob Keane, Pam Sikkink, Jim Reardon, Faith Ann Heinsch, Lisa Holsinger

Wildland fuel mastication is rapidly becoming the preferred fuel treatment for many fire hazard reduction projects, especially in areas where reducing fuels with prescribed fire is challenging. Mastication is the process of mechanically modifying the live and dead surface and canopy biomass to lower fuelbed depth and increase bulk density to reduce fire hazard. The problem is that little is known about the changes in masticated fuels as they age. In 2013, we initiated a comprehensive study called MASTIDON (MASTIcated Decomposed fuel Operational Network) to measure the diverse characteristics of masticated fuelbeds at treatment sites of different ages to evaluate effects of different aged masticated fuelbeds on fire behavior, fuel moisture dynamics, soil heating, and smoldering combustion. These investigations were then used to build fire behavior fuel models for masticated fuelbeds for use in operational fire management. This presentation presents an overall summary of the research findings for the MASTIDON project emphasizing the influence of aging on the masticated fuel characteristics and properties. In summary, we found there were minor changes in masticated fuels as they aged for their (1) physical and chemical properties, (2) rate at which they dried, (3) amount of heat they pulsed into the soil, and (4) fire behavior when burned. We also found that the method of mastication had a more pronounced effect than aging on nearly all of our 15 sites.



Seminar Series

Shawn Urbanski

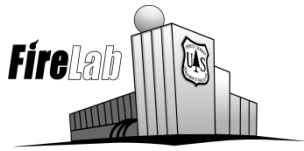
USFS

Date: February 7, 2018

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



Seminar Series

Sean Jeronimo

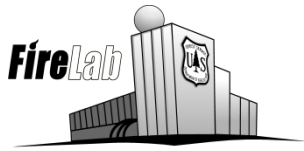
Date: February 14, 2018

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

Forest restoration in the Sierra Nevadas



Seminar Series

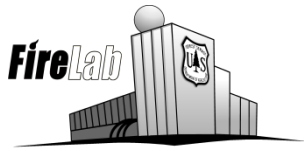
TBD

Date: February 21, 2018

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



Seminar Series

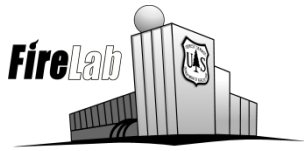
Andrew Larson

Date: February 28, 2018

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



Seminar Series

Phil Higuera

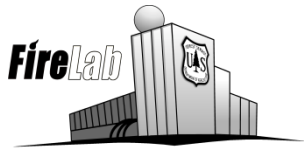
University of Montana

Date: March 7, 2018

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



Seminar Series

Presenter

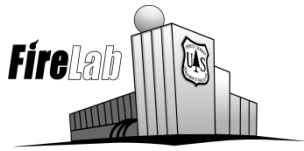
Affiliation

Date: March 14, 2018

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



Seminar Series

Presenter

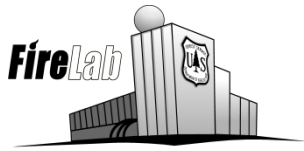
Affiliation

Date: March 21, 2018

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



Seminar Series

Presenter

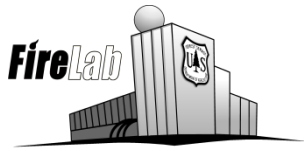
Affiliation

Date: March 28, 2018

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



Seminar Series

Presenter

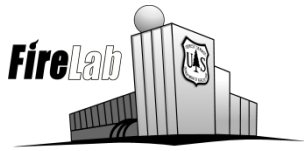
Affiliation

Date: April 4, 2018

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



Seminar Series

Leda Kobziar

University of Idaho

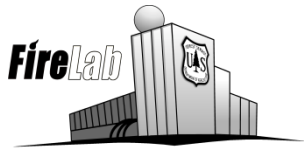
Date: April 11, 2018

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

"The Life in Smoke" thus far



Seminar Series

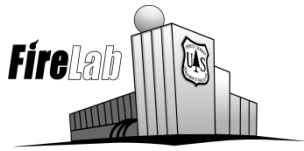
Mark Finney,
USFS

Date: April 18, 2018

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



Seminar Series

Presenter

Affiliation

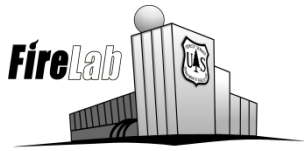
Host:

Date: April 25, 2018

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



Seminar Series

Bret Windom

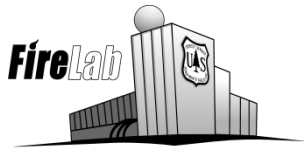
Colorado State

Date: May 2, 2018

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



Seminar Series

Presenter

Affiliation

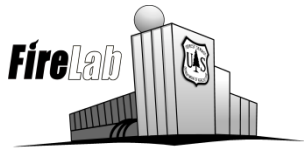
Host:

Date: May 9, 2018

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



Seminar Series

Presenter

Affiliation

Host:

Date: May 16, 2018

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