

### **Modeling thinning effects on fire behavior with STANDFIRE**

[www.nrfirescience.org/resource/18335](http://www.nrfirescience.org/resource/18335)

Key message: We describe a modeling system that enables detailed, 3D fire simulations in forest fuels. Using data from three sites, we analyze thinning fuel treatments on fire behavior and fire effects and compare outputs with a more commonly used model. Context: Thinning is considered useful in altering fire behavior, reducing fire...

Author(s): Russell A. Parsons, F. Pimont, Lucas Wells, Greg M. Cohn, William Matt Jolly, Francois P. deColigny, Eric Rigolot, Jean-Luc Dupuy, William E. Mell, Rodman Linn

Year Published: 2018

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Book or Chapter or Journal Article

### **Simulation of fuel bed ignition by wildland firebrands**

[www.nrfirescience.org/resource/18061](http://www.nrfirescience.org/resource/18061)

A 3-D mathematical model of fuel bed (FB) ignition initiated by glowing firebrands originating during wildland fires is proposed. In order to test and verify the model, a series of experiments was conducted to determine the FB ignition time by a single pine bark and twig firebrand (*Pinus sylvestris*). Irrespective of the pine bark...

Author(s): O. V. Matvienko, Denis P. Kasymov, Alexander I. Filkov, O. I. Daneyko, D. A. Gorbatov

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Book or Chapter or Journal Article

### **Human-related ignitions concurrent with high winds promote large wildfires across the USA**

[www.nrfirescience.org/resource/17823](http://www.nrfirescience.org/resource/17823)

Large wildfires (>40 ha) account for the majority of burned area across the contiguous United States (US) and appropriate substantial suppression resources. A variety of environmental and social factors influence wildfire growth and whether a fire overcomes initial attack efforts and becomes a large wildfire. However, little is...

Author(s): John T. Abatzoglou, Jennifer Balch, Bethany A. Bradley, Crystal A. Kolden

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### **Evaluating the influence of prior burn mosaics on subsequent wildfire behavior, severity, and fire management options - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/18369](http://www.nrfirescience.org/resource/18369)

The Reburn Project was motivated by a need to better understand wildfires as fuel reduction treatments and to assess the impacts of decades of wildland fire suppression activities on forested landscapes. Our study examined three areas, located in the inland Pacific Northwest, central Idaho and interior British Columbia. Each area...

Author(s): Susan J. Prichard, Paul F. Hessburg, Robert W. Gray, Nicholas A. Povak, R. Brion Salter, Camille Stevens-Rumann, Penelope Morgan

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Technical Report or White Paper

### **Evaluation of past-fire mosaics on subsequent wildfire behavior, severity and management strategies - JFSP Final Report**

[www.nrfirescience.org/resource/18250](http://www.nrfirescience.org/resource/18250)

The Reburn Project was motivated by a need to better understand wildfires as fuel reduction treatments

and to assess the impacts of decades of wildland fire suppression activities on forested landscapes. Our study examined three areas, located in the inland Pacific Northwest, central Idaho and interior British Columbia. Each area...

Author(s): Susan J. Prichard, Paul F. Hessburg, Robert W. Gray, Nicholas A. Povak, R. Brion Salter, Camille Stevens-Rumann, Penelope Morgan

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### **Corrigendum to: Use of ordinary kriging and Gaussian conditional simulation to interpolate airborne fire radiative energy density estimates**

[www.nrfirescience.org/resource/18023](http://www.nrfirescience.org/resource/18023)

Fire radiative energy density (FRED,  $J\ m^{-2}$ ) integrated from fire radiative power density (FRPD,  $W\ m^{-2}$ ) observations of landscape-level fires can present an undersampling problem when collected from fixed-wing aircraft. In the present study, the aircraft made multiple passes over the fire at ~3 min intervals, thus failing...

Author(s): C. Klauberg, Andrew T. Hudak, Benjamin C. Bright, Luigi Boschetti, Matthew B. Dickinson, Robert L. Kremens, C. A. Silva

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### **Pyro-Ecophysiology: Shifting the Paradigm of Live Wildland Fuel Research**

[www.nrfirescience.org/resource/17097](http://www.nrfirescience.org/resource/17097)

The most destructive wildland fires occur in mixtures of living and dead vegetation, yet very little attention has been given to the fundamental differences between factors that control their flammability. Historically, moisture content has been used to evaluate the relative flammability of live and dead fuels without considering...

Author(s): William Matt Jolly, Daniel M. Johnson

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Book or Chapter or Journal Article

### **Network analysis of wildfire transmission and implications for risk governance**

[www.nrfirescience.org/resource/16507](http://www.nrfirescience.org/resource/16507)

We characterized wildfire transmission and exposure within a matrix of large land tenures (federal, state, and private) surrounding 56 communities within a 3.3 million ha fire prone region of central Oregon US. Wildfire simulation and network analysis were used to quantify the exchange of fire among land tenures and communities and...

Author(s): Alan A. Ager, Cody Evers, Michelle A. Day, Haiganoush K. Preisler, Ana M. G. Barros, Max W. Nielsen-Pincus

Year Published: 2017

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Book or Chapter or Journal Article

### **High-resolution infrared thermography for capturing wildland fire behaviour: RxCADRE 2012**

[www.nrfirescience.org/resource/13856](http://www.nrfirescience.org/resource/13856)

Wildland fire radiant energy emission is one of the only measurements of combustion that can be made at wide spatial extents and high temporal and spatial resolutions. Furthermore, spatially and temporally explicit measurements are critical for making inferences about fire effects and useful for examining patterns of fire spread. In...

Author(s): Joseph J. O'Brien, E. Louise Loudermilk, Benjamin Hornsby, Andrew T. Hudak, Benjamin C. Bright, Matthew B. Dickinson, J. Kevin Hiers, Casey Teske, Roger D. Ottmar  
Year Published: 2016  
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**Biomass and fire dynamics in a temperate forest-grassland mosaic: Integrating multi-species herbivory, climate, and fire with the FireBGCv2/GrazeBGC system**

[www.nrfirescience.org/resource/13195](http://www.nrfirescience.org/resource/13195)

Landscape fire succession models (LFSMs) predict spatially-explicit interactions between vegetation succession and disturbance, but these models have yet to fully integrate ungulate herbivory as a driver of their processes. We modified a complex LFSM, FireBGCv2, to include a multi-species herbivory module, GrazeBGC. The system is...

Author(s): Robert A. Riggs, Robert E. Keane, Norm Cimon, Rachel Cook, Lisa M. Holsinger, John Cook, Timothy DelCurto, Scott L. Baggett, Donald Justice, David Powell, Martin Vavra, Bridgett J. Naylor

Year Published: 2015

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**When relationships estimated in the past cannot be used to predict the future: using mechanistic models to predict landscape ecological dynamics in a changing world**

[www.nrfirescience.org/resource/16834](http://www.nrfirescience.org/resource/16834)

Researchers and natural resource managers need predictions of how multiple global changes (e.g., climate change, rising levels of air pollutants, exotic invasions) will affect landscape composition and ecosystem function. Ecological predictive models used for this purpose are constructed using either a mechanistic (process-based) or...

Author(s): Eric J. Gustafson

Year Published: 2013

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**Entrainment regimes and flame characteristics of wildland fires**

[www.nrfirescience.org/resource/16925](http://www.nrfirescience.org/resource/16925)

This paper reports results from a study of the flame characteristics of 22 wind-aided pine litter fires in a laboratory wind tunnel and 32 field fires in southern rough and litter-grass fuels. Flame characteristic and fire behaviour data from these fires, simple theoretical flame models and regression techniques are used to...

Author(s): Ralph M. Nelson, Bret W. Butler, David R. Weise

Year Published: 2012

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Book or Chapter or Journal Article

**An individual-based process model to simulate landscape-scale forest ecosystem dynamics**

[www.nrfirescience.org/resource/18461](http://www.nrfirescience.org/resource/18461)

Forest ecosystem dynamics emerges from nonlinear interactions between adaptive biotic agents (i.e., individual trees) and their relationship with a spatially and temporally heterogeneous abiotic environment. Understanding and predicting the dynamics resulting from these complex interactions is crucial for the sustainable stewardship...

Author(s): Rupert Seidl, Werner Rammer, Robert M. Scheller, Thomas A. Spies

Year Published: 2012

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Book or Chapter or Journal Article

### **Influence of fire regimes on lodgepole pine stand age and density across the Yellowstone National Park (USA) landscape**

[www.nrfirescience.org/resource/18410](http://www.nrfirescience.org/resource/18410)

A probabilistic spatial model was created based on empirical data to examine the influence of different fire regimes on stand structure of lodgepole pine (*Pinus contorta* var. *latifolia*) forests across a >500,000-ha landscape in Yellowstone National Park, Wyoming, USA. We asked how variation in the frequency of large fire events...

Author(s): Tania L. Schoennagel, Monica G. Turner, Daniel M. Kashian, Andrew Fall

Year Published: 2006

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Book or Chapter or Journal Article

### **FuelCalc: A tool for calculating wildland fuel quantities and qualities and supporting fuel management decision - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/11165](http://www.nrfirescience.org/resource/11165)

A need exists for a simple computer program to determine surface and canopy fuel quantities (load, bulk density, depth) and qualities (fire behavior fuel model, fire-carrying fuel type) from a variety of fuel inventory data sources. In addition, fuel managers need help analyzing the potential effects of silvicultural treatments on...

Author(s): Elizabeth D. Reinhardt, Joe H. Scott, Duncan C. Lutes

Year Published: 2005

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### **Catastrophic wildfire and number of populations as factors influencing risk of extinction for Gila trout (*Onchorhynchus gilae*)**

[www.nrfirescience.org/resource/18501](http://www.nrfirescience.org/resource/18501)

We used the computer program RAMAS to explore the sensitivity of an extinction-risk model for the Gila trout (*Oncorhynchus gibe*) to management of wildfires and number of populations of the species. The Gila trout is an endangered salmonid presently restricted to very few headwaters of the Gila and San Francisco river tributaries in...

Author(s): D. K. Brown, A. A. Echelle, D. L. Propst, J. E. Brooks, W. L. Fisher

Year Published: 2001

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