

## **Resilient landscapes to prevent catastrophic forest fires: Socioeconomic insights towards a new paradigm**

[www.nrfirescience.org/resource/23183](http://www.nrfirescience.org/resource/23183)

Extreme wildfires are a major environmental and socioeconomic threat across many regions worldwide. The limits of fire suppression-centred strategies have become evident even in technologically well-equipped countries, due to high-cost and a legacy of landscape transformations, yet with ultimately low-efficient solutions vis-à-vis...

Author(s): Sven Wunder, David E. Calkin, Val Charlton, Sarah Feder, Inazio Martinez de Arano, Peter F. Moore, Francisco Rodriguez y Silva, Luca Tacconi, Cristina Vega-García

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

## **Experimental and Numerical Analysis of Formation and Flame Precession of Fire Whirls: A Review**

[www.nrfirescience.org/resource/23492](http://www.nrfirescience.org/resource/23492)

Fire whirls are a particular case of flame behaviour characterized by a rotating column of fire driven by intense convective heating of air close to the ground. They typically result in a substantial increase in burning rate, temperature, and flame height. Fire whirls can occur in any intense flame environment, including urban areas...

Author(s): Maryam Ghodrat, Farshad Shakeriaski, David James Nelson, Albert Simeoni

Year Published: 2021

Type: Document

Book or Chapter or Journal Article

## **Causes and consequences of Eastern Australia's 2019–20 season of mega-fires: A broader perspective**

[www.nrfirescience.org/resource/21705](http://www.nrfirescience.org/resource/21705)

Climates—especially seasonal and long-term droughts—and fuel loads combine to determine risks of wildfires across much of Australia. Here we illustrate how long-term accumulations of fuel combined with a serious drought to drive the behaviour and extent of recent fires in South-eastern Australia. This article is a...

Author(s): Mark A. Adams, Majid Shadmanroodposhti, Mathias Neumann

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Evolution of a pyrocumulonimbus event associated with an extreme wildfire in Tasmania, Australia**

[www.nrfirescience.org/resource/21538](http://www.nrfirescience.org/resource/21538)

Extreme fires have substantial adverse effects on society and natural ecosystems. Such events can be associated with the intense coupling of fire behaviour with the atmosphere, resulting in extreme fire characteristics such as pyrocumulonimbus cloud (pyroCb) development. Concern that anthropogenic climate change is increasing the...

Author(s): Mercy N. Ndalila, Grant J. Williamson, Paul Fox-Hughes, J. Sharples, David M. J. S. Bowman

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Ground wind generated near the base by the massive convective column of very large-scale**

## **mass fires**

[www.nrfirescience.org/resource/20737](http://www.nrfirescience.org/resource/20737)

In large-scale mass fires generated in forests or by a nuclear event, the area of the fire is large (diameter 1 or more kilometers) whereas the flame height is relatively small (less than 10 m) creating a large turbulent buoyant plume. This paper determines a correlation for the magnitude of velocity such a flow generates near...

Author(s): Michael Delichatsios, Jianping Zhang

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **A broader perspective on the causes and consequences of eastern Australia's 2019–20 season of mega-fires: A response to Adams et al.**

[www.nrfirescience.org/resource/21708](http://www.nrfirescience.org/resource/21708)

This article is a Response to Adams et al. 26, 3756–3758. See also the Letter by Nolan et al. 26, 1039–1041. In a response to our Letter on the causes and consequences of the 2019–20 forest fires in eastern Australia (Nolan et al., 2020), Adams, Neumann, and Shadmanroodposhti (2020) argued that fuel loads were causal to the...

Author(s): Ross A. Bradstock, Rachael H. Nolan, Luke Collins, Víctor Resco de Dios, Hamish G. Clarke, Meaghan E. Jenkins, Belinda Kenny, Matthais M. Boer

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Fuel treatment effectiveness in the context of landform, vegetation, and large, wind-driven wildfires**

[www.nrfirescience.org/resource/21599](http://www.nrfirescience.org/resource/21599)

Large wildfires (>50,000 ha) are becoming increasingly common in semi-arid landscapes of the western United States. Although fuel reduction treatments are used to mitigate potential wildfire effects, they can be overwhelmed in wind-driven wildfire events with extreme fire behavior. We evaluated drivers of fire severity and...

Author(s): Susan J. Prichard, Nicholas A. Povak, Maureen C. Kennedy, David W. Peterson

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **Extreme wildfire events and disasters : root causes and new management strategies**

[www.nrfirescience.org/resource/21321](http://www.nrfirescience.org/resource/21321)

Extreme Wildfire Events and Disasters: Root Causes and New Management Strategies highlights the urgent need for new methods to prepare and mitigate the effects of these events. Using a multidisciplinary, socio-ecological approach, the book discusses the roots of the problem, presenting a new, innovative approach to wildfire...

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

## **What can we do differently about the extreme wildfire problem: An overview [Chapter 13]**

[www.nrfirescience.org/resource/21837](http://www.nrfirescience.org/resource/21837)

Fire is a natural process that has shaped the history of Earth long before human presence; imagining a “world without fires is like a sphere without roundness” ([1], p.599). Evidence that massive and intense fires naturally occurred throughout the Holocene [1e3] demonstrates that extreme wildfires events

(EWEs) are not a recent...

Author(s): Fantina Tedim, Sarah M. McCaffrey, Vittorio Leone, Giuseppe M. Delogu, Marc Castelnou, Tara K. McGee, Jose Aranha

Year Published: 2020

Type: Document

Book or Chapter or Journal Article

### **Flow visualization study of stationary fire whirls just downwind of meter-scale turbulent flames**

[www.nrfirescience.org/resource/19203](http://www.nrfirescience.org/resource/19203)

Laboratory experiments were conducted to determine whether stationary fire whirls just downwind of a meter-scale turbulent flame are the lowest part of the counter-rotating vortex pair (CVP) of the plume from the flame. Plumes from a turbulent pool fire and air flow around the fire were visualized. There are two types of stationary...

Author(s): Masahiko Shinohara, Sanae Matsushima

Year Published: 2019

Type: Document

Book or Chapter or Journal Article

### **Inside the megafire**

[www.nrfirescience.org/resource/20081](http://www.nrfirescience.org/resource/20081)

From the front line of the Camp Fire, the deadliest wildfire in California history, NOVA tells the stories of residents who had to flee for their lives during the 2018 fire season. Scientists racing to understand what's behind the rise of record-breaking megafires across the American West take to the forest, and even a fire lab,...

Year Published: 2019

Type: Document

Research Brief or Fact Sheet

### **Fuel mass and stand structure 13 years after logging of a severely burned ponderosa pine forest in northeastern Oregon, U.S.A**

[www.nrfirescience.org/resource/18135](http://www.nrfirescience.org/resource/18135)

Stand structure and fuel mass were measured in 2011, 13 years after logging of a seasonally dry, ponderosa pine-dominated forest that had burned severely in the 1996 Summit Wildfire, Malheur National Forest, northeastern Oregon, U.S.A. Data are compared to those taken one year after post-fire logging (1999), and analyzed in the...

Author(s): James D. McIver, Roger D. Ottmar

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Switching on the Big Burn of 2017**

[www.nrfirescience.org/resource/17761](http://www.nrfirescience.org/resource/17761)

Fuel, aridity, and ignition switches were all on in 2017, making it one of the largest and costliest wildfire years in the United States (U.S.) since national reporting began. Anthropogenic climate change helped flip on some of these switches rapidly in 2017, and kept them on for longer than usual. Anthropogenic changes to the fire...

Author(s): Jennifer Balch, Tania L. Schoennagel, A. Park Williams, John T. Abatzoglou, Megan E. Cattau, Nathan Mietkiewicz, Lise A. St. Denis

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Deconstructing the King Megafire**

[www.nrfirescience.org/resource/17735](http://www.nrfirescience.org/resource/17735)

Hypotheses that megafires ? very large, high impact fires ? are caused by either climate effects such as drought or fuel accumulation due to fire exclusion with accompanying changes to forest structure have long been alleged and guided policy but their physical basis remains untested. Here, unique airborne observations and...

Author(s): Janice L. Coen, E. Natasha Stavros, Jo Ann Fites-Kaufman

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **The Cooney Ridge Fire Experiment: An Early Operation to Relate Pre-, Active, and Post-Fire Field and Remotely Sensed Measurements**

[www.nrfirescience.org/resource/17615](http://www.nrfirescience.org/resource/17615)

The Cooney Ridge Fire Experiment conducted by fire scientists in 2003 was a burnout operation supported by a fire suppression crew on the active Cooney Ridge wildfire incident. The fire experiment included measurements of pre-fire fuels, active fire behavior, and immediate post-fire effects. Heat flux measurements collected at...

Author(s): Andrew T. Hudak, Patrick H. Freeborn, Sarah A. Lewis, Sharon M. Hood, Helen Y. Smith, Colin C. Hardy, Robert J. Kremens, Bret W. Butler, Casey Teske, Robert G. Tissell, Lloyd P. Queen, Bryce L. Nordgren, Benjamin C. Bright, Penelope Morgan, Philip J. Riggan, Lee Macholz, Leigh B. Lentile, Jim Riddering, Edward E. Mathews

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Defining Extreme Wildfire Events: Difficulties, Challenges, and Impacts**

[www.nrfirescience.org/resource/17072](http://www.nrfirescience.org/resource/17072)

Every year worldwide some extraordinary wildfires occur, overwhelming suppression capabilities, causing substantial damages, and often resulting in fatalities. Given their increasing frequency, there is a debate about how to address these wildfires with significant social impacts, but there is no agreement upon terminology to...

Author(s): Fantina Tedim, Vittorio Leone, Malik Amraoui, Christophe Bouillon, Michael R. Coughlan, Giuseppe M. Delogu, Paulo M. Fernandes, Carmen Ferreira, Sarah M. McCaffrey, Tara K. McGee, Joana Parente, Douglas Paton, Mário G. Pereira, Luís M. Ribeiro, Domingos Xavier Viegas, Gavriil Xanthopoulos

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Effects of fuels management on fire intensity, rate of spread, severity, and resultant forest structure within the 2013 Rim Fire landscape - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/18259](http://www.nrfirescience.org/resource/18259)

Large wildfires with uncharacteristically high severity are occurring more frequently in western U.S. forests. The increasing size and severity of wildfires has been attributed to both an increase in weather conducive to fire spread and changes to forest structure and fuel loads due to management practices that included fire...

Author(s): Brandon M. Collins, Jamie M. Lydersen, Van R. Kane, Nicholas A. Povak, Matthew L. Brooks, Douglas F. Smith

Year Published: 2018

Type: Document  
Technical Report or White Paper

### **Analysis of the physical processes associated with junction fires at laboratory and field scales**

[www.nrfirescience.org/resource/16747](http://www.nrfirescience.org/resource/16747)

Junction fires, which involve the merging of two linear fire fronts intersecting at a small angle, are associated with very intense fire behaviour. The dynamic displacement of the intersection point of the two lines and the flow along the symmetry plane of the fire are analysed for symmetric boundary conditions. It is observed that...

Author(s): J. R. Raposo, Domingos Xavier Viegas, X. Xie, Miguel Almeida, A. R. Figueiredo, L. Porto, J. Sharples

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Quantitative evaluation of the Haines Index's ability to predict fire growth events**

[www.nrfirescience.org/resource/17897](http://www.nrfirescience.org/resource/17897)

The Haines Index is intended to provide information on how midtropospheric conditions could lead to large or erratic wildfires. Only a few studies have evaluated its performance and those are primarily single fire studies. This study looks at 47 fires that burned in the United States from 2004 to 2017, with sizes from 9000 ha up to...

Author(s): Brian E. Potter

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Fire Control and the 2015 Canyon Creek Complex Fire**

[www.nrfirescience.org/resource/17757](http://www.nrfirescience.org/resource/17757)

Accordingly, the average annual risk of a wildfire destroying a home in the WUI was less than 1 onehundredth of 1 percent. Of course, the risk is much higher in fire-prone parts of the South and West, but so are expectations that government firefighters will come to the rescue (NWCG 2001; Pyne 2015; Stein and others 2013). Confident...

Author(s): Hutch Brown

Year Published: 2018

Type: Document

Book or Chapter or Journal Article

### **Human exposure and sensitivity to globally extreme wildfire events**

[www.nrfirescience.org/resource/15038](http://www.nrfirescience.org/resource/15038)

Extreme wildfires have substantial economic, social and environmental impacts, but there is uncertainty whether such events are inevitable features of the Earth's fire ecology or a legacy of poor management and planning. We identify 478 extreme wildfire events defined as the daily clusters of fire radiative power from MODIS,...

Author(s): David M. J. S. Bowman, Grant J. Williamson, John T. Abatzoglou, Crystal A. Kolden, Mark A. Cochrane, Alistair M. S. Smith

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Evidence of fuels management and fire weather influencing fire severity in an extreme fire event**

[www.nrfirescience.org/resource/17228](http://www.nrfirescience.org/resource/17228)

Following changes in vegetation structure and pattern, along with a changing climate, large wildfire incidence has increased in forests throughout the western United States. Given this increase, there is great interest in whether fuels treatments and previous wildfire can alter fire severity patterns in large wildfires. We assessed...

Author(s): Jamie M. Lydersen, Brandon M. Collins, Matthew L. Brooks, John R. Matchett, Kristen L. Shive, Nicholas A. Povak, Van R. Kane, Douglas F. Smith

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Interacting effects of fire severity, time since fire and topography on vegetation structure after wildfire**

[www.nrfirescience.org/resource/16674](http://www.nrfirescience.org/resource/16674)

Fire is an important disturbance in forest ecosystems globally. Many of the effects of fire on forest processes are mediated through effects on vegetation structure. Understanding how fire properties, fire regimes and environmental variation interact to affect structure is required in the face of predictions of increasing size and...

Author(s): Michelle Bassett, Steven W.J. Leonard, Evelyn K. Chia, Michael F. Clarke, Andrew F. Bennett

Year Published: 2017

Type: Document

Book or Chapter or Journal Article

### **Synthesis of knowledge of extreme fire behavior: volume 2 for fire behavior specialists, researchers, and meteorologists**

[www.nrfirescience.org/resource/14330](http://www.nrfirescience.org/resource/14330)

The National Wildfire Coordinating Group's definition of extreme fire behavior indicates a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning/spotting, presence of fire whirls, and strong...

Author(s): Paul A. Werth, Brian E. Potter, Martin E. Alexander, Miguel G. Cruz, Craig B. Clements, Mark A. Finney, Jason M. Forthofer, Scott L. Goodrick, Chad M. Hoffman, William Matt Jolly, Sara S. McAllister, Roger D. Ottmar, Russell A. Parsons

Year Published: 2016

Type: Document

Synthesis, Technical Report or White Paper

### **Quantifying the influence of previously burned areas on suppression effectiveness and avoided exposure: a case study of the Las Conchas Fire**

[www.nrfirescience.org/resource/13919](http://www.nrfirescience.org/resource/13919)

We present a case study of the Las Conchas Fire (2011) to explore the role of previously burned areas (wildfires and prescribed fires) on suppression effectiveness and avoided exposure. Methodological innovations include characterisation of the joint dynamics of fire growth and suppression activities, development of a fire line...

Author(s): Matthew P. Thompson, Patrick H. Freeborn, Jon D. Rieck, David E. Calkin, Julie W. Gilbertson-Day, Mark A. Cochrane, Michael S. Hand

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Near-term probabilistic forecast of significant wildfire events for the western United States**

[www.nrfirescience.org/resource/14704](http://www.nrfirescience.org/resource/14704)

Fire danger and potential for large fires in the United States (US) is currently indicated via several forecasted qualitative indices. However, landscape-level quantitative forecasts of the probability of a large fire are currently lacking. In this study, we present a framework for forecasting large fire occurrence – an extreme...

Author(s): Haiganoush K. Preisler, Karen L. Riley, Crystal S. Stonesifer, David E. Calkin, William Matt Jolly

Year Published: 2016

Type: Document

Book or Chapter or Journal Article

### **Future mega-fires and smoke impacts**

[www.nrfirescience.org/resource/15579](http://www.nrfirescience.org/resource/15579)

“Megafire” events, in which large high-intensity fires propagate over extended periods, can cause both immense damage to the local environment and catastrophic air quality impacts on cities and towns downwind. Increases in extreme events associated with climate change (e.g., droughts, heat waves) are projected to result in more...

Author(s): Narasimhan K. Larkin, John T. Abatzoglou, Donald McKenzie, Brian E. Potter, E. Ashley Steel, Brian J. Stocks

Year Published: 2015

Type: Document

Technical Report or White Paper

### **Seasonal reversal of the influence of El Niño–Southern Oscillation on very large wildfire occurrence in the interior northwestern United States**

[www.nrfirescience.org/resource/15643](http://www.nrfirescience.org/resource/15643)

Satellite-mapped fire perimeters and the multivariate El Niño–Southern Oscillation index were used to examine the impact of concurrent El Niño–Southern Oscillation (ENSO) phase on very large fire (VLF) occurrences over the intermountain northwestern United States (U.S.) from 1984 to 2012. While the warm phase of ENSO promotes...

Author(s): Renaud Barbero, John T. Abatzoglou, Timothy J. Brown

Year Published: 2015

Type: Document

Book or Chapter or Journal Article

### **Impacts of mega-fires on large U.S. urban area air quality under changing climate and fuels**

[www.nrfirescience.org/resource/15569](http://www.nrfirescience.org/resource/15569)

Mega-fires can adversely impact air quality in the United States and the impacts are likely to become more serious in the future due to the possibility of more frequent and intense mega-fires in response to the projected climate change. This study investigated U.S. mega-fires and fuel conditions and their environmental impacts under...

Author(s): Yongqiang Liu, Scott L. Goodrick, John A. Stanturf, Hanqin Tian

Year Published: 2014

Type: Document

Technical Report or White Paper

### **Regional projections of the likelihood of very large wildland fires under a changing climate in the contiguous western United States**

[www.nrfirescience.org/resource/13006](http://www.nrfirescience.org/resource/13006)

Seasonal changes in the climatic potential for very large wildfires (VLWF > or = 50,000 ac ~20,234 ha)

across the western contiguous United States are projected over the 21st century using generalized linear models and downscaled climate projections for two representative concentration pathways (RCPs). Significant ( $p < 0.05$ )...

Author(s): E. Natasha Stavros, John T. Abatzoglou, Donald McKenzie, Narasimhan K. Larkin

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Crown fire potential in lodgepole pine forests during the red stage of mountain pine beetle attack**

[www.nrfirescience.org/resource/12926](http://www.nrfirescience.org/resource/12926)

Mountain pine beetle (MPB) outbreaks within the previous 10-15 years have affected millions of hectares of lodgepole pine forests in western North America. Concerns about the influence of recent tree mortality on changes in fire behaviour amongst firefighters and fire managers have led researchers to attempt to quantify the effects...

Author(s): Wesley G. Page, Michael J. Jenkins, Martin E. Alexander

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Modeling very large-fire occurrences over the continental United States from weather and climate forcing**

[www.nrfirescience.org/resource/15656](http://www.nrfirescience.org/resource/15656)

Very large-fires (VLFs) have widespread impacts on ecosystems, air quality, fire suppression resources, and in many regions account for a majority of total area burned. Empirical generalized linear models of the largest fires (>5000 ha) across the contiguous United States (US) were developed at 60 km spatial and weekly...

Author(s): Renaud Barbero, John T. Abatzoglou, E. Ashley Steel, Narasimhan K. Larkin

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Defining extreme wildland fires using geospatial and ancillary metrics**

[www.nrfirescience.org/resource/12953](http://www.nrfirescience.org/resource/12953)

There is a growing professional and public perception that 'extreme' wildland fires are becoming more common due to changing climatic conditions. This concern is heightened in the wildland-urban interface where social and ecological effects converge. 'Mega-fires', 'conflagrations', 'extreme' and 'catastrophic' are descriptors...

Author(s): Karen O. Lannom, Wade T. Tinkham, Alistair M. S. Smith, John T. Abatzoglou, Beth A.

Newingham, Troy E. Hall, Penelope Morgan, Eva K. Strand, Travis B. Paveglio, John Anderson, Aaron M. Sparks

Year Published: 2014

Type: Document

Book or Chapter or Journal Article

### **Crown fire behavior characteristics and prediction in conifer forests: a state-of-knowledge synthesis - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/12447](http://www.nrfirescience.org/resource/12447)

Joint Fire Science Program (JFSP) project 09-S-03-1 was undertaken in response to JFSP Project Announcement No. FA-RFA09-0002 with respect to a synthesis on extreme fire behavior or more specifically a review and analysis of the literature dealing with certain features of crown fire behavior in

conifer forests in the United States...

Author(s): Martin E. Alexander, Miguel G. Cruz, Nicole M. Vaillant, David L. Peterson

Year Published: 2013

Type: Document

Synthesis, Technical Report or White Paper

### **Modelling conditional burn probability patterns for large wildland fires**

[www.nrfirescience.org/resource/12005](http://www.nrfirescience.org/resource/12005)

We present a technique for modelling conditional burn probability patterns in two dimensions for large wildland fires. The intended use for the model is strategic program planning when information about future fire weather and event durations is unavailable and estimates of the average probabilistic shape and extent of large fires...

Author(s): Pamela S. Ziesler, Douglas B. Rideout, Robin Reich

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Fire weather case study - Mann Gulch Fire, Montana**

[www.nrfirescience.org/resource/11976](http://www.nrfirescience.org/resource/11976)

The intent of this report is to analyze weather conditions to determine if a 'critical fire weather pattern' also contributed to the 'blowup.'

Author(s): Paul A. Werth

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Quantifying the potential impacts of fuel treatments on wildfire suppression costs**

[www.nrfirescience.org/resource/16138](http://www.nrfirescience.org/resource/16138)

Modeling the impacts and effects of hazardous fuel reduction treatments is a pressing issue within the wildfire management community. Prospective evaluation of fuel treatment effectiveness allows for comparison of alternative treatment strategies in terms of socioeconomic and ecological impacts and facilitates analysis of tradeoffs...

Author(s): Matthew P. Thompson, Nicole M. Vaillant, Jessica R. Haas, Krista M. Gebert, Keith Stockmann

Year Published: 2013

Type: Document

Book or Chapter or Journal Article

### **Fire behaviour case study of two early winter grass fires in southern Alberta, 27 November 2011**

[www.nrfirescience.org/resource/11995](http://www.nrfirescience.org/resource/11995)

On November 27, 2011, two wildfires - the Lethbridge Fire and the Milk River Ridge Fire - starting within approximately an hour of each other, advanced in a north-easterly direction some 12 km and 32 km, respectively, from their point of origin in a relatively short period of time. Fortunately, no lives were lost. However, a few...

Author(s): Martin E. Alexander, Mark J. Heathcott, Randall L. Schwanke

Year Published: 2013

Type: Document

Technical Report or White Paper

### **The Waldo Canyon Fire: Fires on the Colorado Front Range and Home Destruction - A Report to**

### **the Pike and San Isabel National Forests**

[www.nrfirescience.org/resource/11266](http://www.nrfirescience.org/resource/11266)

The purpose of this white paper is to discuss fires on the Colorado Front Range and to share initial observations of fire behavior and home destruction during the Waldo Canyon Fire. It is my hope that these lessons and observations will be beneficial to agencies and especially the public. I want to share this information early when...

Author(s): Richard D. Stratton

Year Published: 2012

Type: Document

Technical Report or White Paper

### **Towards the understanding of extreme wildland fire behavior**

[www.nrfirescience.org/resource/11092](http://www.nrfirescience.org/resource/11092)

The author presents a brief discussion of the changing face of extreme fire behavior and an introduction to Synthesis of knowledge of extreme fire behavior: volume I for fire managers.

Author(s): Martin E. Alexander

Year Published: 2012

Type: Document

Research Brief or Fact Sheet

### **Numerical simulation of crown fire hazard immediately after bark beetle-caused mortality in lodgepole pine forests**

[www.nrfirescience.org/resource/8325](http://www.nrfirescience.org/resource/8325)

Quantifying the effects of mountain pine beetle (MPB)-caused tree mortality on potential crown fire hazard has been challenging partly because of limitations in current operational fire behavior models. Such models are not capable of accounting for fuel heterogeneity resulting from an outbreak. Further, the coupled interactions...

Author(s): Chad M. Hoffman, Penelope Morgan, William E. Mell, Russell A. Parsons, Eva K. Strand, Stephen Cook

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Modeling tree-level fuel connectivity to evaluate the effectiveness of thinning treatments for reducing crown fire potential**

[www.nrfirescience.org/resource/8295](http://www.nrfirescience.org/resource/8295)

Land managers have been using fire behavior and simulation models to assist in several fire management tasks. These widely-used models use average attributes to make stand-level predictions without considering spatial variability of fuels within a stand. Consequently, as the existing models have limitations in adequately modeling...

Author(s): Marco A. Contreras, Russell A. Parsons, Woodam Chung

Year Published: 2012

Type: Document

Book or Chapter or Journal Article

### **Fourmile Canyon Fire Findings**

[www.nrfirescience.org/resource/17701](http://www.nrfirescience.org/resource/17701)

The Fourmile Canyon Fire burned in the fall of 2010 in the Rocky Mountain Front Range adjacent to Boulder, Colorado. The fire occurred in steep, rugged terrain, primarily on privately owned mixed ponderosa pine and Douglas-fir forests. The fire started on September 6 when the humidity of the air was very dry (about <7%) and the...

Author(s): Russell T. Graham, Mark A. Finney, Charles W. McHugh, Jack D. Cohen, David E. Calkin, Richard D. Stratton, Ned Nikolov  
Year Published: 2012  
Type: Document  
Technical Report or White Paper

### **How fuel treatments saved homes from the 2011 Wallow fire**

[www.nrfirescience.org/resource/17699](http://www.nrfirescience.org/resource/17699)

This is a fuel treatment effectiveness assessment report from Region 3 about the success of fuel treatments in protecting several communities from the recent Wallow fire in Arizona and New Mexico. The report narrative and graphics point to the success of good forest management and good community assistance to protect life, property...

Author(s): Pam Bostwick, James P. Menakis, Tim Sexton  
Year Published: 2011  
Type: Document  
Technical Report or White Paper

### **Both topography and climate affected forest and woodland burn severity in two regions of the western US**

[www.nrfirescience.org/resource/15318](http://www.nrfirescience.org/resource/15318)

Fire is a keystone process in many ecosystems of western North America. Severe fires kill and consume large amounts of above- and belowground biomass and affect soils, resulting in long-lasting consequences for vegetation, aquatic ecosystem productivity and diversity, and other ecosystem properties. We analyzed the occurrence of,...

Author(s): Gregory K. Dillon, Zachary A. Holden, Penelope Morgan, Michael A. Crimmins, Emily K. Heyerdahl, Charles H. Luce  
Year Published: 2011  
Type: Document  
Book or Chapter or Journal Article

### **Review of fuel treatment effectiveness in forests and rangelands and a case study from the 2007 megafires in central, Idaho, USA**

[www.nrfirescience.org/resource/11449](http://www.nrfirescience.org/resource/11449)

This report provides managers with the current state of knowledge regarding the effectiveness of fuel treatments for mitigating severe wildfire effects. A literature review examines the effectiveness of fuel treatments that had been previously applied and were subsequently burned through by wildfire in forests and rangelands. A case...

Author(s): Andrew T. Hudak, Ian Rickert, Penelope Morgan, Eva K. Strand, Sarah A. Lewis, Peter R. Robichaud, Chad M. Hoffman, Zachary A. Holden  
Year Published: 2011  
Type: Document  
Synthesis, Technical Report or White Paper

### **Linking 3D spatial models of fuels and fire: effects of spatial heterogeneity on fire behavior**

[www.nrfirescience.org/resource/14161](http://www.nrfirescience.org/resource/14161)

Crownfire endangers fire fighters and can have severe ecological consequences. Prediction of fire behavior in tree crowns is essential to informed decisions in fire management. Current methods used in fire management do not address variability in crown fuels. New mechanistic physics-based fire models address convective heat transfer...

Author(s): Russell A. Parsons, William E. Mell, Peter McCauley  
Year Published: 2011

Type: Document  
Book or Chapter or Journal Article

### **Synthesis of knowledge of extreme fire behavior: Volume 1 for managers**

[www.nrfirescience.org/resource/12566](http://www.nrfirescience.org/resource/12566)

The National Wildfire Coordinating Group definition of extreme fire behavior (EFB) indicates a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning/spotting, presence of fire whirls, and strong...

Author(s): Paul A. Werth, Brian E. Potter, Craig B. Clements, Mark A. Finney, Scott L. Goodrick, Martin E. Alexander, Miguel G. Cruz, Jason M. Forthofer, Sara S. McAllister

Year Published: 2011

Type: Document

Synthesis, Technical Report or White Paper

### **Assessing crown fire potential in coniferous forests of western North America: a critique of current approaches and recent simulation studies**

[www.nrfirescience.org/resource/8187](http://www.nrfirescience.org/resource/8187)

To control and use wildland fires safely and effectively depends on credible assessments of fire potential, including the propensity for crowning in conifer forests. Simulation studies that use certain fire modelling systems (i.e. NEXUS, FlamMap, FARSITE, FFE-FVS (Fire and Fuels Extension to the Forest Vegetation Simulator), Fuel...

Author(s): Miguel G. Cruz, Martin E. Alexander

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **Large scale fire whirls: can their formation be predicted?**

[www.nrfirescience.org/resource/16937](http://www.nrfirescience.org/resource/16937)

Large scale fire whirls have not traditionally been recognized as a frequent phenomenon on wildland fires. However, there are anecdotal data suggesting that they can and do occur with some regularity. This paper presents a brief summary of this information and an analysis of the causal factors leading to their formation.

Author(s): Jason M. Forthofer, Bret W. Butler

Year Published: 2010

Type: Document

Conference Proceedings

### **Characterization of convective heating in full scale wildland fires**

[www.nrfirescience.org/resource/16929](http://www.nrfirescience.org/resource/16929)

Data collected in the International Crown Fire modeling Experiment during 1999 are evaluated to characterize the magnitude and duration of convective energy heating in full scale crown fires. To accomplish this objective data on total and radiant incident heat flux, air temperature, and horizontal and vertical gas velocities were...

Author(s): Bret W. Butler

Year Published: 2010

Type: Document

Conference Proceedings

### **How big was Dodge's escape fire?**

[www.nrfirescience.org/resource/8289](http://www.nrfirescience.org/resource/8289)

Several published accounts exist of how smokejumper foreman Wag Dodge survived the 1949 Mann Gulch Fire in northwestern Montana by setting an 'escape fire' in cured grass fuels, the most notable among them being Norman Maclean's 1992 book *Young Men and Fire*. Two other smokejumpers survived by reaching a rockslide. Sadly, 12...

Author(s): Martin E. Alexander

Year Published: 2010

Type: Document

Book or Chapter or Journal Article

### **In-situ characterization of wildland fire behavior**

[www.nrfirescience.org/resource/16932](http://www.nrfirescience.org/resource/16932)

A system consisting of two enclosures has been developed to characterize wildland fire behavior: The first enclosure is a sensor/data logger combination that measures and records convective/radiant energy released by the fire. The second is a digital video camera housed in a fire proof enclosure that records visual images of fire...

Author(s): Bret W. Butler, Daniel M. Jimenez, Jason M. Forthofer, Paul Sopko, Kyle S. Shannon, James J. Reardon

Year Published: 2010

Type: Document

Conference Proceedings

### **An analysis of Dodge's escape fire on the 1949 Mann Gulch Fire in terms of a survival zone for wildland firefighters**

[www.nrfirescience.org/resource/11020](http://www.nrfirescience.org/resource/11020)

The Wildland Fire Operations Research Group of FPIInnovations-Feric Division in collaboration with the University of Alberta initiated a project in late 2007 at the request of its stakeholders to examine and define the limits of wildland firefighter safety and survival zones. Part of this project involves examining past wildfire...

Author(s): Martin E. Alexander, Mark Y. Ackerman, Gregory J. Baxter

Year Published: 2009

Type: Document

Conference Proceedings

### **Fuel treatments, fire suppression, and their interaction with wildfire and its impact: the Warm Lake experience during the Cascade Complex of wildfires in central Idaho, 2007**

[www.nrfirescience.org/resource/17700](http://www.nrfirescience.org/resource/17700)

Wildfires during the summer of 2007 burned over 500,000 acres within central Idaho. These fires burned around and through over 8,000 acres of fuel treatments designed to offer protection from wildfire to over 70 summer homes and other buildings located near Warm Lake. This area east of Cascade, Idaho, exemplifies the difficulty of...

Author(s): Russell T. Graham, Theresa B. Jain, Mark Loseke

Year Published: 2009

Type: Document

Technical Report or White Paper

### **The 1988 fires of Yellowstone and beyond as a wildland fire behavior case study**

[www.nrfirescience.org/resource/11217](http://www.nrfirescience.org/resource/11217)

A 'Learning Organization' is an organization that creates, acquires, interprets, transfers, and retains knowledge and purposefully modifies its behavior to reflect new knowledge and insights (Garvin 2000). Dr. Marty Alexander's report *The 1988 Fires of Yellowstone and Beyond as a Wildland Fire Behavior*

Case Study now provides the...  
Author(s): Martin E. Alexander  
Year Published: 2009  
Type: Document  
Technical Report or White Paper

### **January 31st 2009 off-season grassland wildfire**

[www.nrfirescience.org/resource/11145](http://www.nrfirescience.org/resource/11145)

Wildland fires can be high impact events no matter what the season or fuel type. While the first image that comes to mind of wildland fire suppression is timbered mountainous terrain on a late summer afternoon, this wildland fire occurred in relatively flat grasslands during the overnight and early morning hours, during the...

Author(s): Robert W. Hoenisch  
Year Published: 2009  
Type: Document  
Technical Report or White Paper

### **Testing the modeled effectiveness of an operational fuel reduction treatment in a small western Montana interface landscape using two spatial scales**

[www.nrfirescience.org/resource/8410](http://www.nrfirescience.org/resource/8410)

Much of the coniferous zones in the Western United States where fires were historically frequent have seen large increases in stand densities and associated forest fuels due to 20th century anthropogenic influences. This condition is partially responsible for contemporary large, uncharacteristically severe wildfires. Therefore,...

Author(s): Michael G. Harrington, Erin Noonan-Wright, Mitchell Doherty  
Year Published: 2007  
Type: Document  
Conference Proceedings

### **An assessment of fuel treatments on three large 2007 Pacific Northwest fires**

[www.nrfirescience.org/resource/17705](http://www.nrfirescience.org/resource/17705)

The Monument Fire burned across a landscape with extensive but relatively low intensity fuel treatments that reduced severe fire effects. The area that burned in the Egley Complex included both extensive underburns and intensive, strategically located fuel and other vegetation treatments that improved suppression effectiveness. The...

Author(s): Steve Harbert, Andrew T. Hudak, Laura Mayer, T. D. Rich, Sarah Robertson  
Year Published: 2007  
Type: Document  
Technical Report or White Paper

### **A fuel treatment reduces fire severity and increases suppression efficiency in a mixed conifer forest**

[www.nrfirescience.org/resource/17717](http://www.nrfirescience.org/resource/17717)

Fuel treatments are being implemented on public and private lands across the western United States. Although scientists and managers have an understanding of how fuel treatments can modify potential fire behaviour under modelled conditions, there is limited information on how treatments perform under real wildfire conditions in...

Author(s): Jason J. Moghaddas, Larry Craggs  
Year Published: 2007  
Type: Document  
Book or Chapter or Journal Article

### **Organizational characteristics that contribute to success in engaging the public to accomplish fuels management at the wilderness/non-wilderness interface**

[www.nrfirescience.org/resource/10984](http://www.nrfirescience.org/resource/10984)

In the fall of 2003, the Rocky Mountain Ranger District of the Lewis and Clark National Forest initiated a multi-year, large-scale prescribed burn in the Scapegoat Wilderness. The objectives of this burn were to make the non-wilderness side of the wilderness boundary more defensible from wildfire and to establish conditions that...

Author(s): Katie Knotek, Alan E. Watson

Year Published: 2006

Type: Document

Conference Proceedings

### **Optimizing landscape treatments for reducing wildfire risk and improving ecological sustainability of ponderosa pine forests with mixed severity fire regimes - Part 2 - Final Report to the Joint Fire Science Program**

[www.nrfirescience.org/resource/11169](http://www.nrfirescience.org/resource/11169)

A mixed severity fire regime historically created complex landscape structures in ponderosa pine forests of the Colorado Front Range. Mitigating present wildfire risks and restoring these forests to ecologically sustainable conditions requires new guidelines for landscape treatment. However, vast acreages need treatment while only...

Author(s): Merrill R. Kaufmann, Jimmie D. Chew, J. Greg Jones

Year Published: 2005

Type: Document

Technical Report or White Paper

### **'Brewer fire mystery' discussion**

[www.nrfirescience.org/resource/8288](http://www.nrfirescience.org/resource/8288)

Occasionally, Fire Management Today publishes comments from readers on topics of concern, offering authors a chance to respond. Stephen A. Eckert contends that the 'Brewer fire mystery' is not so mysterious. He says that the conditions were ripe for extreme fire behavior, and that under those conditions, the fire quickly went from a...

Author(s): Stephen A. Eckert, Martin E. Alexander

Year Published: 2004

Type: Document

Book or Chapter or Journal Article

### **Wildland fire behavior case studies and analysis: part 2**

[www.nrfirescience.org/resource/15996](http://www.nrfirescience.org/resource/15996)

This resource is a special issue of Fire Management Today that includes articles on fire behavior and descriptions of specific large fires that have important lessons in fire fighter safety.

Year Published: 2003

Type: Document

Book or Chapter or Journal Article

### **Assessing the value of increased model resolution in forecasting fire danger**

[www.nrfirescience.org/resource/10969](http://www.nrfirescience.org/resource/10969)

The fire season of 2000 was used as a case study to assess the value of increasing mesoscale model resolution for fire weather and fire danger forecasting. With a domain centered on Western Montana and Northern Idaho, MM5 simulations were run at 36, 12, and 4-km resolutions for a 30 day period at

the height of the fire season....

Author(s): Jeanne L. Hoadley, Miriam L. Rorig, Kenneth Westrick, Larry S. Bradshaw, Sue A. Ferguson, Scott L. Goodrick, Paul A. Werth

Year Published: 2003

Type: Document

Conference Proceedings

### **Fire whirls, fire tornados, and fire storms: physical and numerical modeling**

[www.nrfirescience.org/resource/11022](http://www.nrfirescience.org/resource/11022)

Fire whirls are a typically rare but potentially catastrophic form of fire. They are observed during urban and forest fires, where fire "tornadoes" are characterized by large-scale whirling flames which rise in 2 to 360 m diameter vortices from 10 to 1200 m high. These fire whirls accelerate combustion, produce significant suction...

Author(s): Robert N. Meroney

Year Published: 2003

Type: Document

Conference Proceedings

### **The Mann Gulch Fire and the Canadian Forest Fire Danger Rating System**

[www.nrfirescience.org/resource/8408](http://www.nrfirescience.org/resource/8408)

The year 1999 marks the 50th anniversary of the Mann Gulch Fire that occurred in western Montana on August 5, 1949 (Matthews 1999). There has been considerable interest amongst the Canadian wildland fire community in the 1949 Mann Gulch Fire ever since the publishing of MacLean's (1992) book 'Young Men and Fire' and Rothermel's (...)

Author(s): Martin E. Alexander

Year Published: 2000

Type: Document

Conference Proceedings

### **Wildfire case study: Butte City Fire, southeastern Idaho, July 1, 1994**

[www.nrfirescience.org/resource/11146](http://www.nrfirescience.org/resource/11146)

The Butte City Fire occurred on July 1, 1994, west of Idaho Falls, ID. Ignited from a burning flat tire, the blaze was driven by high winds that caused it to cover over 20,500 acres in just over 6.5 hours.

Sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) is the principal shrub species of this high desert rangeland. With the...

Author(s): Bret W. Butler, Timothy D. Reynolds

Year Published: 1997

Type: Document

Technical Report or White Paper

### **Fire growth maps for the 1988 Greater Yellowstone Area fires**

[www.nrfirescience.org/resource/11212](http://www.nrfirescience.org/resource/11212)

Daily fire growth maps display the growth of the 1988 fires in the Greater Yellowstone Area. Information and data sources included daily infrared photography flights, satellite imagery, ground and aerial reconnaissance, command center intelligence, and the personal recollections of fire behavior observers. Fire position was...

Author(s): Richard C. Rothermel, Roberta A. Hartford, Carolyn H. Chase

Year Published: 1994

Type: Document

Technical Report or White Paper

### **The evaluation of Idaho wildfire growth using the Haines Index**

[www.nrfirescience.org/resource/8307](http://www.nrfirescience.org/resource/8307)

An atmospheric index specifically designed to be related to the growth of wildland fires is evaluated for two recent Idaho fires. The index includes terms related to high midlevel lapse rates and low-level dry air. In the cases examined, the index performs well at pinpointing the time of the most explosive fire growth. Long-term...

Author(s): Paul A. Werth, Richard Ochoa

Year Published: 1993

Type: Document

Book or Chapter or Journal Article

### **Fuel moisture, forest type, and lightning-caused fire in Yellowstone National Park**

[www.nrfirescience.org/resource/13568](http://www.nrfirescience.org/resource/13568)

The occurrence and behavior of lightning-caused fires in Yellowstone National Park were summarized for 17 years (1972-1988) during a prescribed natural fire program. Both ignition (occurrence) and spread (Stand replacing fire activity) of fires were strongly influenced by fuel moisture and forest cover type. Fuel moisture estimates...

Author(s): Roy A. Renkin, Don G. Despain

Year Published: 1992

Type: Document

Book or Chapter or Journal Article

### **Predicting behavior and size of crown fires in the northern Rocky Mountains**

[www.nrfirescience.org/resource/11195](http://www.nrfirescience.org/resource/11195)

Assessment of crown fire conditions calls for two important judgments: (1) identifying conditions for the onset of severe fires, and (2) predicting the spread rate, intensity, and size of expected crown fires. This paper addresses the second problem and provides methods for making a first approximation of the behavior of a running...

Author(s): Richard C. Rothermel

Year Published: 1991

Type: Document

Technical Report or White Paper

### **Predicting behavior of the 1988 Yellowstone fires: projections versus reality**

[www.nrfirescience.org/resource/8252](http://www.nrfirescience.org/resource/8252)

An account is presented of the initial long range, 30-day, projections of fire growth of the wildfires in the Greater Yellowstone Area in 1988. The request for information, the method of prediction, and the actual fire growth are discussed and documented with maps. The difficulties and uncertainties of long-range fire prediction...

Author(s): Richard C. Rothermel

Year Published: 1991

Type: Document

Book or Chapter or Journal Article

### **The 1985 Butte fire in central Idaho: a Canadian perspective on the associated burning conditions**

[www.nrfirescience.org/resource/11055](http://www.nrfirescience.org/resource/11055)

During the afternoon of August 29, 1985, the Butte Fire made a high-intensity crown fire run, covering a distance of 2.22 km in one hour and 40 minutes, and forcing 73 fire fighters to deploy their protective fire shelters. This paper presents a retrospective analysis of the fire behavior in terms of the two major

subsystems of the...

Author(s): Martin E. Alexander

Year Published: 1991

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Help with making crown fire hazard assessments**

[www.nrfirescience.org/resource/11046](http://www.nrfirescience.org/resource/11046)

This paper offers some suggestions and field guides with respect to the operational application of C.E. Van Wagner's (1997, Can. J. For. Res. 7:23-34) theory to calculate the threshold conditions for the start and spread of crown fires in conifer forests. Three categories of crowning are recognized (passive, active, and independent...

Author(s): Martin E. Alexander

Year Published: 1988

Type: Document

Conference Proceedings, Technical Report or White Paper

### **Behavior of the life-threatening Butte Fire: August 27-29, 1985**

[www.nrfirescience.org/resource/8314](http://www.nrfirescience.org/resource/8314)

On August 29, 1985, 73 firefighters were forced into safety zones, where they took refuge in their fire shelters for 1 to 2 hours while a very severe crown fire burned over them. The incident took place on the Butte Fire on the Salmon National Forest in Idaho. Five firefighters were hospitalized overnight for heat exhaustion, smoke...

Author(s): Richard C. Rothermel, Robert W. Mutch

Year Published: 1985

Type: Document

Book or Chapter or Journal Article

### **Fire Review of the 1985 Log Tom Fire Complex (Butte Fire)**

[www.nrfirescience.org/resource/15987](http://www.nrfirescience.org/resource/15987)

This report reviews the Long Tom Fire Complex. The review team identified 11 issues and provided alternatives for them to reduce suppression costs, improve suppression efficiency, and minimize resource impacts on future large fires in the Salmon River area.

Author(s): Jerry Monesmith, Dick Flannelly, Bert Strom, Jim Lawrence

Year Published: 1985

Type: Document

Management or Planning Document

### **Modeling behavior of prescribed fires in Yosemite National Park**

[www.nrfirescience.org/resource/8313](http://www.nrfirescience.org/resource/8313)

The National Fire Danger Rating System and the Fire Behavior Prediction System were tested on prescribed fires burning underneath canopies in six fuel types in Yosemite National Park, California. The mean error for rate of spread was +0.03 foot per minute for the NFDRS and -0.15foot for the FBPS. For flame length factors for...

Author(s): Jan W. van Wagendonk, Stephen J. Botti

Year Published: 1984

Type: Document

Book or Chapter or Journal Article

**Wildland fires: predicting the behavior of wildland fires-among nature's most potent forces-can**

### **save lives, money, and natural resources**

[www.nrfirescience.org/resource/8315](http://www.nrfirescience.org/resource/8315)

During a period of three days in mid-February 1983, bushfires swept over 400,000 ha in southern Australia, killing 74 people, destroying more than 2,000 homes, and burning out 7 towns. This tragic repetition of the fires of January 1939, in which 71 people perished, was foretold by Noble (1977), whose monograph on the 1939 fires...

Author(s): Frank A. Albini

Year Published: 1984

Type: Document

Book or Chapter or Journal Article

### **Broadcast burning in larch-fir clearcuts: the Miller Creek-Newman Ridge study**

[www.nrfirescience.org/resource/11950](http://www.nrfirescience.org/resource/11950)

Seventy-three clearcuts in western larch/Douglas-fir forests of western Montana were broadcast burned over a wide range of environmental conditions for the purpose of quantifying fire characteristics and burn accomplishment. The moisture content of the upper duff, and the National Fire-Danger Rating System Buildup Index (1964) were...

Author(s): William R. Beaufait, Charles E. Hardy, William C. Fischer

Year Published: 1975

Type: Document

Technical Report or White Paper

### **Meteorological factors in the Sundance Fire run**

[www.nrfirescience.org/resource/11905](http://www.nrfirescience.org/resource/11905)

Strong, sustained, southwesterly winds were a major factor in the Sundance Fire run in northern Idaho during which the fire front raced 16 miles northeastward within a 9-hr. period on September 1, 1967. These winds were found to be dependent upon an unusually strong summertime pressure gradient ahead of an approaching trough,...

Author(s): Arnold I. Finklin

Year Published: 1973

Type: Document

Technical Report or White Paper

### **Sundance Fire: an analysis of fire phenomena**

[www.nrfirescience.org/resource/11229](http://www.nrfirescience.org/resource/11229)

The Sundance Fire on September 1, 1967, made a spectacular run of 16 miles in 9 hours and destroyed more than 50,000 acres. This run became the subject of a detailed research analysis of the environmental, topographic, and vegetation variables aimed at reconstructing and describing fire phenomena. This report details the fire's...

Author(s): Hal E. Anderson

Year Published: 1968

Type: Document

Technical Report or White Paper

### **Fire behavior in Northern Rocky Mountain Forests**

[www.nrfirescience.org/resource/11133](http://www.nrfirescience.org/resource/11133)

The main purpose of this publication is to summarize the most important aspects of fire behavior as we now know them. The author recognizes that there are still many unknowns in the behavior of forest and range fires. These unknowns will be the targets of future research. In the meantime it is important that the best available...

Author(s): Jack S. Barrows

Year Published: 1951  
Type: Document  
Technical Report or White Paper

### **Death in Blackwater Canyon**

[www.nrfirescience.org/resource/11494](http://www.nrfirescience.org/resource/11494)

On August 21, 1937, the tragic Blackwater Fire caused the death of 15 firefighters, burning approximately 1,700 acres of National Forest System lands on the Shoshone National Forest, near Cody, Wyoming. An electrical storm occurred in the general vicinity of Blackwater Creek on Wednesday, August 18th causing a fire, which was not...

Author(s): Erle Kauffman  
Year Published: 1937  
Type: Document  
Book or Chapter or Journal Article

### **Meteorological conditions affecting the Freeman Lake (Idaho) Fire**

[www.nrfirescience.org/resource/8305](http://www.nrfirescience.org/resource/8305)

[Excerpt from text] Measurements of meteorological conditions prevailing during the rapid spread of forest fires are greatly needed so that when their recurrence seems probable, fire weather forecasters may issue warnings of the danger.

Author(s): George M. Jemison  
Year Published: 1932  
Type: Document  
Book or Chapter or Journal Article

### **Meteorological factors in the Quartz Creek forest fire**

[www.nrfirescience.org/resource/8304](http://www.nrfirescience.org/resource/8304)

[Excerpted from text] It is not often that a large forest fire occurs conveniently near a weather station specially equipped for measuring forest-fire weather. The 13,000-acre Quartz Creek fire on the Kaniksu National Forest during the summer of 1936 was close enough to the Priest River Experimental...

Author(s): Harry T. Gisborne  
Year Published: 1927  
Type: Document  
Book or Chapter or Journal Article